ADAMS BROADWELL JOSEPH & CARDOZO
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
601 GATEWAY BOULEVARD, SUITE 1000
SOUTH SAN FRANCISCO, CA 94080-7037
TEL: (650) 589-1660
FAX: (650) 589-5062
kfederman@adamsbroadwell.com

SACRAMENTO OFFICE
520 CAPITOL MALL, SUITE 350
SACRAMENTO, CA 95814-4721
TEL: (916) 444-6201
FAX: (916) 444-6209

DANIEL L. CARDOZO
CHRISTINA M. CARO
THOMAS A. ENSLOW
KELILAH D. FEDERMAN
ANDREW J. GRAF
TANYA A. GULESSERIAN
KENDRA D. HARTMANN*
KYLE C. JONES
RACHAEL E. KOSS
AIDAN P. MARSHALL
WILLIAM C. MUMBY

MARC D. JOSEPH
Of Counsel

*Not admitted in California.
Licensed in Colorado.

February 22, 2021

Via Email and Overnight Mail

Robert Peterson
Project Manager
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
Email: robert.peterson@cpuc.ca.gov

Tom Engels, PhD
Horizon Water and Environment, LLC
266 Grand Avenue, Suite 210
Oakland, CA 94610
Emails: tom@horizonh2o.com
estrellaproject@horizonh2o.com

Re: **Comments on Draft Environmental Impact Report for Estrella Substation and Paso Robles Area Reinforcement Project**

Dear Mr. Peterson & Mr. Engels:

On behalf of California Unions for Reliable Energy ("CURE" or "Commenters"), we submit these comments on the Draft Environmental Impact Report ("DEIR") prepared by the California Public Utilities Commission ("CPUC") for the Estrella Substation and Paso Robles Area Reinforcement Project ("Project"). The Project is proposed by Horizon West Transmission ("HWT") (formerly NextEra Energy Transmission West, LLC) and Pacific Gas & Electric Company ("PG&E") (collectively referred to as "Applicants"). The Proposed Project would construct and operate a new 230 kilovolt (kV) /70 kV substation and a new 7-mile-long 70 kV

power line, and replacement/reconductoring of approximately 3 miles of existing 70 kV power line interconnecting with the substation.[1]

The Project would be located in unincorporated San Luis Obispo County and within the City of Paso Robles, approximately 9 miles southeast of the San Miguel community, and 8.5 miles northeast of Templeton.[2] The DEIR estimates the Proposed Project will take 18 months to construct.[3] Construction will take 8 months for the Estrella Substation, and an additional 10 months for the 70 kV power line.[4] Proponent's environmental assessment estimated that the project would take 7 months to construct.[5] The distribution components are expected within 15 years.[6]

We have reviewed the DEIR, its technical appendices, and reference documents with assistance of Commenters' expert consultants, whose comments and qualifications are attached. Based on our review of the DEIR, it is clear that the DEIR fails as an informational document under CEQA and lacks substantial evidence to support its conclusions that the Project's significant impacts would be mitigated to the greatest extent feasible.

There is also substantial evidence demonstrating that the Project's potentially significant environmental impacts are far more extensive than disclosed in the DEIR. Commenters and their expert consultants have identified numerous potentially significant impacts that the DEIR either mischaracterizes, underestimates, or fails to identify. Moreover, many of the mitigation measures described in the DEIR will not, in fact, mitigate impacts to the extent claimed. For example, Commenters' air quality expert Phyllis Fox Ph.D. found that Project construction emissions will exceed applicable significance thresholds, the risk of Valley Fever is significant and unmitigated, and Greenhouse Gas ("GHG") emissions from Project construction and operation are underestimated.[7] The DEIR

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[1]Horizon Water and Environment, Estrella Substation and Paso Robles Area Reinforcement Project - *Draft Environmental Impact Report* ("DEIR"), December 2020, p. ES-1.
[2] DEIR, p. 2-15.
[3] DEIR, p. 2-78.
[4] DEIR, p. 4.8
[5] Proponent's Environmental Assessment Estrella Substation and Paso Robles Area Reinforcement Project ("PEA"), p. 2-59.
[6] DEIR, p. 2-16.
[7] See **Exhibit A,** Phyllis Fox, Ph.D., P.E., Comments on the Draft Environmental Impact Report for the Estrella Substation and Paso Robles Area Reinforcement Project (Fox Comments").

fails to accurately disclose the severity of these impacts, and fails to effectively mitigate them.

Commenters' expert biologist Scott Cashen, M.S. concludes that the Project will have potentially significant and unmitigated impacts to wildlife and sensitive natural communities including Blue Oak Woodland, and special-status wildlife including Golden Eagle and other special status birds, amphibians, and bumble bees.[8]

Expert utility consultant David Marcus concludes that the DEIR fails to accurately describe the Project's environmental setting. Mr. Marcus explains that the Estrella substation is not needed to meet Paso Robles Distribution Planning Area ("DPA") peak loads, to improve distribution system reliability by reducing outages, or to mitigate the impacts of an outage of the Templeton-Paso Robles 70 kV transmission line, to mitigate the impacts of an outage of the Templeton 230/70 kV transformer, to mitigate the impacts of an N-2 (Category C) outage of both 230 kV lines that connect to the Templeton 230/70 kV transformer.[9] Further, the DEIR fails to reference the additional transmission line to Cholame Substation to create a looped circuit referred in the Updated Appendix G of Proponent's Environmental Assessment. The failure to address this "likely" element of the Project is impermissible piecemealing under CEQA.[10]

Finally, agricultural consultant Gregory House concludes that Project construction will have significant permanent and temporary impacts to Important Agricultural areas that were not adequately analyzed or mitigated in the DEIR. As discussed further herein, the mitigation measures proposed to offset the permanent loss of agricultural lands are inadequate because they do not create new Important farmland, additionally replacement, de-compaction, and replanting measures were not adequately analyzed.[11]

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[8] See **Exhibit B,** Scott Cashen, M.S., Comments on the Draft Environmental Impact Report for the Estrella Substation and Paso Robles Area Reinforcement Project (January 22, 2021) ("Cashen Comments").
[9] See **Exhibit C,** David Marcus, M.S., Comments on the Draft Environmental Impact Report for the Estrella Substation and Paso Robles Area Reinforcement Project (January 22, 2021) ("Marcus Comments").
[10] 14 14 Cal. Code Regs. ("CCR") § 15165.
[11] See **Exhibit D,** Gregory House, Review of Mitigation Measures Proposed for Agriculture and Forestry Resources, Estrella Substation and Paso Robles Area Reinforcement Project DEIR (February 11, 2021) ("House Comments").

CEQA prohibits a lead agency from approving a project if feasible alternatives or mitigation measures exist which would substantially lessen a project's significant environmental effects.[12] As discussed herein, there is substantial evidence demonstrating that adoption of Alternative PLR-3A and PLR-3B is feasible, and would substantially lessen the Project's previously disclosed significant environmental effects, and would meet all Project objectives. Commenters' experts present additional substantial evidence demonstrating that additional mitigation measures are necessary to mitigate the Project's numerous potentially significant environmental effects.

CEQA requires recirculation of a DEIR for public review and comment when significant new information must be added to the DEIR following public review, but before certification.[13] The CEQA Guidelines clarify that new information is significant if "the DEIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the Project or a feasible way to mitigate or avoid such an effect."[14] The purpose of recirculation is to give the public and other agencies an opportunity to evaluate the new data and the validity of conclusions drawn from it.[15]

The CPUC is tasked with ensuring that Californians receive safe, reliable utility service and infrastructure at reasonable rates, with a *commitment to environmental quality* and a prosperous California economy.[16] In order to comply with this mandate, and the mandates of CEQA, the DEIR must be revised to resolve its inadequacies and recirculated for public review and comment.

I. STATEMENT OF INTEREST

CURE is a coalition of labor organizations whose members encourage sustainable development of California's energy and natural resources. CURE's members help solve the State's energy problems by building, maintaining, and

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[12] Pub. Resources Code ("PRC") §21002; *Cal. Clean Energy Comm. v. City of Woodland* (2014) 225 Cal.App.4th 173, 203; 14 CCR §15126.6.
[13] PRC § 21092.1.
[14] CEQA "Guidelines," 14 Cal. Code Regs. § 15088.5.
[15] *Save Our Peninsula Comm. v. Monterey City Bd. of Supervisors* (1981) 122 Cal.App.3d 813, 822.
[16] California Public Utilities Commission Annual Report, January 26, 2016, Cover letter to Honorable Edmund G. Brown Jr., Governor of the State of California, and distinguished members of the California State Legislature, *available at*: http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/About_Us/Annual_Reports/2015%20CPUC%20Performance%20and%20Accountability%20Annual%20Report_v004.pdf.

operating conventional and renewable energy power plants and transmission facilities. Since its founding in 1997, CURE has been committed to building a strong economy and a healthier environment. CURE has helped cut smog-forming pollutants in half, reduced toxic emissions, increased the use of recycled water for cooling systems, and pushed for groundbreaking pollution control equipment as the standard for all new power plants, all while helping to ensure that new power plants and transmission facilities are built with highly trained, professional workers who live and raise families in nearby communities.

Individual members of CURE and its member organizations include Cheryl Stoltenberg, Todd Kadota, Evan Lincer, Jonathon Montoya, Jeff Branson, and Thomas Grennan. These individuals live, work, recreate, and raise their families in Paso Robles, in the vicinity of the Project. Accordingly, they will be directly affected by the Project's environmental and health and safety impacts. Individual members may also work on the Project itself. They will be the first in line to be exposed to any health and safety hazards that exist onsite.

CURE has an interest in enforcing environmental laws that encourage sustainable development and ensure a safe working environment for the members that they represent. Environmental degradation destroys cultural and wildlife areas, consumes limited fresh surface and ground water resources, causes water pollution, and imposes other stresses on the environmental carrying capacity of the state. This in turn jeopardizes future development by causing construction moratoriums and otherwise reducing future employment opportunities for CURE's members. CURE therefore has a direct interest in enforcing environmental laws to minimize the adverse impacts of projects that would otherwise degrade the environment.

Finally, CURE members are concerned about projects that risk serious environmental harm without providing countervailing economic benefits. For these reasons, CURE's mission includes improving California's economy and the environment by ensuring that new conventional and renewable power plants and their related transmission facilities use the best practices to protect our clean air, land and water and to minimize their environmental impacts and footprint.

II. LEGAL BACKGROUND

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an environmental impact report ("EIR") (except in limited

circumstances).[17] The EIR is the very heart of CEQA.[18] "The foremost principle in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language."[19]

CEQA has two primary purposes. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project.[20] "Its purpose is to inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR 'protects not only the environment but also informed self-government.'"[21] The EIR has been described as "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return."[22]

Second, CEQA directs public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures.[23] The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be avoided or significantly reduced."[24] If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns."[25]

While the courts review an EIR using an "abuse of discretion" standard, "the reviewing court is not to 'uncritically rely on every study or analysis presented by a project proponent in support of its position. *A clearly inadequate or unsupported*

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[17] See, e.g., PRC § 21100.
[18] *Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652.
[19] *Comtys. for a Better Envv. Cal. Res. Agency* (2002) 103 Cal. App.4th 98, 109 ("*CBE v. CRA*").
[20] 14 CCR § 15002(a)(1).
[21] *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 564.
[22] *Berkeley Keep Jets Over the Bay v. Bd. of Port Comm'rs.* (2001) 91 Cal. App. 4th 1344, 1354 ("*Berkeley Jets*"); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.
[23] 14 CCR § 15002(a)(2) and (3); *see also Berkeley Jets*, 91 Cal.App.4th at 1354; *Citizens of Goleta Valley*, 52 Cal.3d at 564.
[24] 14 CCR §15002(a)(2).
[25] PRC § 21081; 14 CCR § 15092(b)(2)(A) & (B).
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study is entitled to no judicial deference."[26] As the courts have explained, "a prejudicial abuse of discretion occurs "if the failure to include relevant information precludes informed decision making and informed public participation, thereby thwarting the statutory goals of the EIR process."[27] Further, "an agency may abuse its discretion under CEQA by either failing to proceed in the manner CEQA provides or by reaching factual conclusions unsupported by substantial evidence."[28]

III. THE DEIR FAILS TO PROVIDE A COMPLETE AND ACCURATE PROJECT DESCRIPTION

The DEIR does not meet CEQA's requirements because it fails to include an accurate, complete and stable Project description, rendering the entire analysis inadequate. CEQA requires that an EIR "set forth a project description that is sufficient to allow an adequate evaluation and review of the environmental impact."[29] An accurate project description is necessary for an intelligent evaluation of the potential environmental effects of a proposed activity.[30] "An accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR."[31] Accordingly, a lead agency may not hide behind its failure to obtain a complete and accurate project description.[32]

"Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal ... and weigh other alternatives in the balance."[33] As articulated by the court in *County of Inyo v. City of Los Angeles*, "a curtailed, enigmatic or unstable project description draws a red herring across the path of public input."[34] Without a

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[26] *Berkeley Jets*, 91 Cal. App. 4th at 1355 (emphasis added), *quoting, Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 391 409, fn. 12.
[27] *Berkeley Jets*, 91 Cal.App.4th at 1355; *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 722; *Galante Vineyards v. Monterey Peninsula Water Management Dist.* (1997) 60 Cal.App.4th 1109, 1117; *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 946.
[28] PRC § 21168.5.
[29] *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 654 (citing 14 C.C.R. § 15124).
[30] McQueen v. Board of Directors (1988) 202 Cal. App. 3d 1136, 1143.
[31] *Santiago County Water Dist. v. County of Orange* 118 Cal. App. 3d 818, 829-830.
[32] *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 311 ("*Sundstrom*").
[33] *Santiago County Water Dist. v. County of Orange* 118 Cal. App. 3d 818, 829-830.
[34] *Id.* at 197-198.

complete project description, the environmental analysis under CEQA is impermissibly limited, thus minimizing the project's impacts and undermining meaningful public review.[35]

The purpose of an EIR is to reveal to the public "the basis on which its responsible officials either approve or reject environmentally significant action," so that the public, "being duly informed, can respond accordingly to action with which it disagrees."[36] Further, "[t]o be adequate, the EIR must include sufficient detail to enable those who did not participate in its preparation to understand and 'meaningfully' consider the issues raised by the proposed project."[37]

A. The DEIR's Project Description is Inadequate Because it Fails to Provide an Adequate Description of Vegetation Management Activities

The DEIR fails to provide a clear description of the vegetation management activities that would be implemented to comply with CPUC General Order ("G.O.") 95 and PG&E and HWT wildfire mitigation plans.[38] As a result, the DEIR fails to provide sufficient detail about the environmental impacts associated with the Project's vegetation management activities.

The DEIR indicates that "Project proponents may [keep the 10-foot radius around new 70 kV power poles] clear of natural vegetation. Vegetation growing too close to conductors within the easement would be trimmed or removed for safety. Herbicides may be used for some vegetation maintenance activities."[39]

Commenters' biological expert, Mr. Cashen determined that this description is too vague to understand the environmental impacts of the Project.[40] Thus, to enable an accurate evaluation of environmental impacts from vegetation

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[35] *See, e.g., Laurel Heights Improvement Assn. v. Regents of the Univ. of Cal.* (1988) 47 Cal.3d 376.
[36] *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 392
[37] *California Oak Foundation v. City of Santa Clarita* 133 Cal.App.4th 1219, 1237 quoting *Santa Clarita Organization for Planning the Environment* 106 Cal.App.4th 715, 721; see also *Concerned Citizens of Costa Mesa Inc, v. 32nd Dist. Agricultural Assn.* (1986) 42 Cal.3d 929,935 ["To facilitate CEQA's informational role, the EIR must contain facts and analysis, not just the agency's bare conclusions or opinions"].
[38] Cal. Pub. Util. Code § 8386(c)(8).
[39] DEIR, p. 2-87.
[40] Cashen Comments p. 2.

management, the CPUC must clearly articulate: (1) the vegetation management activities that would be conducted between power poles and the distance those activities would extend from the power lines (conductors); (2) the methods that would be used to remove, trim, or otherwise manipulate vegetation (e.g., masticators, chainsaws, loppers, etc.); (3) the herbicide products that may be used; (4) the frequency (return interval) of vegetation management activities (by vegetation community, if applicable); (5) the vegetation communities that may be manipulated to comply with G.O. 95; (6) whether the 10-foot radius would be limited to vegetation that grows within 10 horizontal feet of any conductor (as indicated on DEIR p. 4.4-53), or whether it also would include vegetation within 10 vertical feet; and (7) why numerous oak trees along the 70 kV route, but not within a 10-foot radius of the power poles, would be trimmed or removed.[41]

The DEIR should be revised and recirculated to include an adequate description of the Project's vegetation management activities.

B. The DEIR's Project Description is Inadequate Because of Impermissible Piecemealing

1. *Cholame Substation Reliability Piecemealing*

The DEIR fails to explain that Estrella is not needed to mitigate reliability issues at and around the Cholame substation. As Mr. Marcus explains, although there are approximately 1500 Cholame-area customers at risk for scheduled outages every 1-2 years for maintenance work on the 70 kV line feeding Cholame substation, those outages are not a violation of NERC or CAISO or PG&E reliability criteria. PG&E has stated clearly that it has no plans to use the proposed Estrella substation as a source for a new 70 kV line to Cholame to supplement the existing single line there.[42]

The updated Appendix G to the PEA states that "The proposed project provides a future opportunity to add an additional transmission line to Cholame Substation to create a looped circuit to improve reliability and operational flexibility on the 70 kV system. This line would likely be constructed within 2 to 3 years after

[41] *See* DEIR, Figure 3-7.
[42] CPUC, Data Request No. 5 (November 13, 2019) for the Estrella Substation and Paso Robles Area Reinforcement Project (A.17-01-023) *available at*: https://www.cpuc.ca.gov/environment/info/horizonh2o/estrella/docs/2019-1113%20EstrellaDataRequestNo.5%20and%20Follow%20Ups.docx.

Estrella Substation is built."[43] To the extent that building the Estrella Substation would lead to construction of a new 70 kV or 21 kV line from Estrella to Cholame, the DEIR should have addressed that result. The failure to do so constitutes impermissible piecemealing.

CEQA forbids piecemeal review of the significant environmental impacts of a project.[44] Agencies cannot allow "environmental considerations [to] become submerged by chopping a large project into many little ones-each with a minimal potential impact on the environment-which cumulatively may have disastrous consequences."[45] The CEQA Guidelines provide "Where an individual project is a necessary precedent for action on a larger project, or commits the Lead Agency to a larger project, with significant environmental effect, an EIR must address itself to the scope of the larger project."[46] The statement in the Updated Appendix G to the PEA that the "line [to Cholame substation] would likely be constructed within 2 to 3 years after Estrella Substation is built" should have been analyzed in the DEIR. The CEQA Guidelines provide "the agency may prepare one EIR for all projects, or one for each project, but shall in either case comment upon the cumulative effect."[47] The DEIR should be revised and recirculated to include an analysis of the cumulative impact of the additional line to Cholame, otherwise the impact must be analyzed in a subsequent EIR.

The DEIR must be revised and recirculated to address the piecemealing issues related to utility reliability.

IV. THE DEIR'S DESCRIPTION OF THE ENVIRONMENTAL SETTING IS INADEQUATE

The DEIR fails to adequately describe the environmental setting against which the Project's environmental impacts are to be measured for several critical aspects of the Project. This contravenes the fundamental purpose of the

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[43] Proponent's Environmental Assessment Estrella Substation and Paso Robles Area Reinforcement Project, Updated Appendix G Distribution Need Analysis (August 2017) *available at*: https://www.cpuc.ca.gov/environment/info/horizonh2o/estrella/docs/App%20G%20-%20Update%202%20v2.pdf.
[44] 14 CCR § 15165; *Banning Ranch Conservancy v. City of Newport Beach* (2012) 211 Cal.App.4th 1209, 1222; *Berkeley Jets,* 91 Cal.App.4th at 1358.
[45] *Bozung v. Local Agency Formation Com.* (1975) 13 Cal.3d 263, 283-284.
[46] 14 CCR § 15165.
[47] *See* 14 CCR § 15165.

environmental review process, which is to determine whether there is a potentially substantial, adverse change compared to the existing setting. CEQA requires that a lead agency include a description of the physical environmental conditions, or "baseline," in the vicinity of the project as they exist at the time environmental review commences.[48] As the courts have repeatedly held, the impacts of a project must be measured against the "real conditions on the ground."[49] The description of the environmental setting constitutes the "baseline" physical conditions against which the lead agency assesses the significance of a project's impacts.[50]

A. The DEIR Fails to Accurately Describe the Project's Environmental Setting Related to Utility Capacity

CEQA requires a DEIR to identify baseline physical conditions in the environmental setting section "to give the public and decision makers the most accurate and understandable picture practically possible of the project's likely near-term and long-term impacts.[51]

1. *Estrella Substation is Not Needed to Meet DPA Peak Loads*

The DEIR failed to adequately describe the environmental setting with regard to utility service in the Project area. The DEIR states that the DPA loads "will exceed the available capacity of the Paso Robles system within 5 to 15 years."[52] Mr. Marcus found that the Paso Robles DPA loads will not exceed the DPA capacity of 212.55 Mw until 2047.[53] Mr. Marcus determined that Estrella Substation is not needed to meet a DPA capacity problem, because such a problem does not exist today, and is not projected to exist in this decade, nor well into the 2040s. The DEIR therefore mischaracterizes the environmental setting regarding utility capacity, in violation of CEQA.

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[48] 14 CCR § 15125(a); *Communities for a Better Environment v. South Coast Air Quality Management Dist*. (2010) 48 Cal. 4th 310, 321 ("*CBE v. SCAQMD*").
[49] *CBE v.* SCAQMD, 48 Cal. 4th at 321; Save *Our Peninsula Com. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 121-22; *City of Carmel-by-the-Sea v. Bd. of Supervisors of Monterey County* (1986) 183 Cal.App.3d 229, 246.
[50] 14 CCR § 15125(a); *CBE v.* SCAQMD, 48 Cal. 4th at 321.
[51] 14 CCR § 15125(a).
[52] DEIR, p. 2-12.
[53] Marcus Comments p. 1.
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Without an accurate description of the environmental setting, the DEIR fails as an informational document under CEQA. A revised DEIR must be revised and recirculated.

2. *Templeton Outage*

The environmental setting analysis in the DEIR is inadequate because it fails to adequately explain the existing conditions related to power outages which would support the DEIR's conclusion that Estrella Substation is needed to mitigate an outage of the Templeton 230/70 kV transformer.[54] The DEIR does not explain why the new 230/70 kV substation could not be located 2 miles, which Mr. Marcus explains would result in reduced impacts.[55] Relocating the 230/70 kV substation farther from Templeton substation would also increase the claimed distribution benefits of the new substation, should it ever be used as a distribution substation.[56] The DEIR fails to adequately analyze these issues because it relies on an illusory baseline.

3. *N-2 Outage*

The DEIR fails to explain that the Project is not needed in light of existing conditions. Mr. Marcus determined that Estrella Substation is not needed to mitigate the impacts of an N-2 (Category C) outage of both 230 kV lines that connect to the Templeton 230/70 kV transformer.[57] Reliability rules allow load to be dropped after the outage of two separate transmission lines.[58] A double 230 kV line outage on the lines feeding Templeton would make the Templeton transformer unusable, as the DEIR asserts, and thus cause overloads on the underlying 70 kV system during high load periods. But the Project would not resolve this issue. As Mr. Marcus explains, even if Estrella were built as proposed, Paso Robles would still face a blackout after an N-2 outage of the Estrella-Paso Robles and Templeton-Paso Robles 70 kV lines.[59] The same is true for the environmentally preferred alternative described in the DEIR. Paso Robles is currently at risk of blackouts from a double transmission line outage, and Estrella would not change that fact. The DEIR explains that CAISO's original authorization of Estrella was based on

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[54] Marcus Comments, p. 5.
[55] *Id.*
[56] *Id.*
[57] *Id.*
[58] *Id.*
[59] *Id.*

mitigating N-1 contingencies, and Estrella cannot be justified by its impact on N-2 contingencies.[60]

Mr. Marcus determined that even if it were appropriate to build new facilities just to mitigate the consequences of an N-2 outage, it is unclear that Estrella would be adequate.[61] The year after Estrella was approved, the CAISO concluded that the proposed new Estrella-Paso Robles line would overload after an N-2 outage of the two 230 kV lines connected to the Templeton substation.[62] Therefore, the DEIR must be revised and recirculated to provide an accurate description of the existing utility conditions.

B. The DEIR Fails to Provide Sufficient Baseline Information on Golden Eagles

The DEIR fails to provide a complete and accurate description of the Project's environmental setting related to golden eagles, and thus, the DEIR's impact assessment and proposed mitigation for impacts to golden eagles are inadequate.

Golden eagles are protected under the federal Bald and Golden Eagle Protection Act, which prohibits take of golden eagles and their occupied and unoccupied nests, and are a fully protected species under State law.[63] The DEIR was required to carefully evaluate the Project's baseline conditions for golden eagles in order to evaluate whether the Project would disturb eagles, nests or habitat. Biologist Mr. Cashen determined that CPUC did not conduct adequate baseline surveys to establish these existing conditions.

First, the CPUC did not conduct protocol-level surveys for eagle nests. As Mr. Cashen explains, the USFWS recommends protocol-level surveys for occupied nesting territories within two miles of the area where take may occur.[64] Without this information, the DEIR lacks substantial evidence to conclude that the Project will not adversely impact eagles, nests, or habitat.

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[60] *Id.* at 6.
[61] *Id.* at 6.
[62] CAISO, Preliminary Reliability Assessment Results (September 24-25, 2014) p. 91 *available at*: https://www.caiso.com/Documents/Presentation-PreliminaryReliabilityAssessmentResults-Sep24_2014.pdf.
[63] DEIR, p. 4.4-1,
[64] Cashen Comments, p. 4.

Further, DEIR Figure 4.4-5 does not distinguish between active and inactive nests. Project impacts have the potential to be severe on golden eagles due to their intolerance to anthropogenic forms of disturbance, and their susceptibility to collision with, and electrocution from, power lines.[65] Additional information is required to determine Impacts of the Proposed Project and Project alternatives on golden eagle nest territories and important eagle-use areas.[66] A revised DEIR should clarify whether Figure 4.4-5 depicts all active and inactive nests, or only active nests. The DEIR should explain the methods used to confirm a nest was inactive, and identify the years each nest was last surveyed to determine its status.

Third, the DEIR appears to rely on incomplete reporting data. The California Natural Diversity Database ("CNDDB") staff often have a backlog of occurrence data that have not been entered into the database. This appears to be the case for golden eagle nest records. A revised DEIR should clarify whether the information provided in the DEIR includes unprocessed data that can be obtained by contacting CNDDB staff and the US Fish and Wildlife Service.

Finally, the DEIR fails to mention that the eBird database has multiple records of golden eagles within the Paso Robles city limits between 2016 and 2020.[67] The DEIR erroneously suggests that the most recent observation on eBird was in 2015.[68] The eBird database suggest that four sightings of golden eagles have been registered since 2018, at Barney Schwartz Park, a distance of less than three miles from the Estrella Substation site.[69]

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[65] *Id.* at 3; U.S. Fish and Wildlife Service, Division of Migratory Bird Management. 2009. Final Environmental Assessment, Proposal to Permit Take as Provided Under the Bald and Golden Eagle Protection Act. Washington: Dept. of Interior. *See also* U.S. Fish and Wildlife Service. 2013 Apr. Eagle Conservation Plan Guidance: Module 1—Land-based Wind Energy, Ver 2. pp. ii and iii.
[66] Important eagle-use area is defined as: "an eagle nest, foraging area, or communal roost site that eagles rely on for breeding, sheltering, or feeding, and the landscape features surrounding such nest, foraging area, or roost site that are essential for the continued viability of the site for breeding, feeding, or sheltering eagles" (as defined at 50 CFR 22.26).
[67] eBird.org, Map Function, Golden Eagle Search, https://ebird.org/map/goleag?neg=true&env.minX=-120.74407377548609&env.minY=35.52383762834864&env.maxX=-120.4924181968728&env.maxY=35.74316208344104&zh=true&gp=false&ev=Z&mr=1-12&bmo=1&emo=12&yr=all&byr=1900&eyr=2021.
[68] DEIR, p. 4.4-19.
[69] eBird.org, Barney Schwartz Park, San Luis Obispo County, California, US: Sightings, *available at*: https://ebird.org/hotspot/L3558694.
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A revised DEIR must identify the methods that were used to obtain information on golden eagle nests in the vicinity of the Proposed Project and Project alternatives.

V. THE DEIR RELIES ON INFORMATION BURIED IN PROPONENT'S ENVIRONMENTAL ASSESSMENT APPENDICES

The DEIR is inadequate as an informational document because readers of the DEIR are expected to search through appendices of the Proponent's Environmental Assessment in order to find pertinent information regarding greenhouse gas emissions, and utility distribution. For example, the GHG emission sulfur hexafluoride ("SF_6") calculations that the DEIR says are in appendix C of the DEIR are actually in appendix C of the Proponent's Environmental Assessment. It is not reasonable for the CPUC to approve this DEIR without the inclusion of the necessary information in the EIR that Applicants cite to.

The court in *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* determined that a reader of the EIR could not reasonably be expected to ferret out an unreferenced discussion in an earlier document, interpret that discussion's unexplained figures without assistance, and spontaneously incorporate them into the EIR's own discussion.[70] The court held "[t]he data in the EIR must not only be sufficient in quantity, it must be presented in a manner calculated to adequately inform the public and decision makers, who may not be previously familiar with the details of the project."[71]

Further, "information scattered here and there in EIR appendices or a report buried in an appendix, is not a substitute for a good faith reasoned analysis."[72] The requirement of a detailed analysis ensures that stubborn problems or serious criticism are not "swept under the rug."[73] Here, the DEIR fails to include the detailed analysis required for the SF_6 analysis within the Greenhouse Gas Emissions section. Without persistent searching by Commenters' experts, we would have been unable to find the relevant information undergirding the DEIR's

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[70] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 442.
[71] *Id.*
[72] *Id., quoting California Oak Foundation v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219, 1239, *quoting Santa Clarita Organization for Planning the Environment v. County of Los Angeles* (2003) 106 Cal.App.4th 715, 723.
[73] *Cleary v. County of Stanislaus* (1981) 118 Cal.App.3d 348, 357.

analyses. The CPUC cannot certify the DEIR, as is, because the relied on information is not actually incorporated or described and referenced clearly in the DIER.[74]

The DEIR must be revised and recirculated to include the reference information undergirding the determinations made in the EIR.

VI. THE DEIR FAILS TO ADEQUATELY ANALYZE IMPACTS AND INCORPORATE ALL FEASIBLE MITIGATION MEASURES AND ALTERNATIVES AS REQUIRED BY CEQA

CEQA's purpose is to "[p]revent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the chances to be feasible."[75] CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures.[76]

"CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible."[77] A public agency cannot approve a project if there are feasible alternatives or mitigation measures available that would substantially lessen any significant effects that the project would have on the environment.[78] CEQA defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors."[79]

"The core of an EIR is the mitigation and alternatives sections."[80] The CEQA Guidelines define mitigation as a measure which (1) avoids the impact altogether by not taking a certain action or parts of an action, (2) minimizes the impact by limiting the degree or magnitude of the action and its implementation, (3)

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[74] *See Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 442.
[75] 14 CCR § 15002(a)(3).
[76] 14 CCR § 15002(a)(2) and (3); *see also Berkeley Jets*, 91 Cal.App.4th at 1354; *Citizens of Goleta Valley*, 52 Cal.3d at 564.
[77] 14 CCR § 15021(a).
[78] 14 CCR § 15021(a)(2).
[79] 14 CCR § 15364.
[80] *Citizens of Goleta Valley v. Bd. of Supervisors ("Goleta II")* (1990) 52 Cal.3d 553, 564.

rectifies the impact by repairing, rehabilitating, or restoring the impacted environment, (4) reduces or eliminates the impact overtime by preservation and maintenance operations during the life of the action, and (5) compensates for the impact by replacing or providing substitute resources or environments.[81] "In deciding whether changes in a project are feasible, an agency may consider specific economic, environmental, legal, social, and technological factors."[82]

A lead agency is prohibited from approving a project with significant impacts unless it makes one or more of three findings:

(1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.[83]
(2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.[84]
(3) Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.[85]

Findings as to mitigation measures must be supported by substantial evidence.[86] Substantial evidence means "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached."[87] Substantial evidence "shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts,"[88] but it should not include "[a]rgument, speculation, unsubstantiated opinion or narrative, evidence which is clearly erroneous or inaccurate, or evidence of social or economic impacts which do

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[81] 14 CCR § 15370.
[82] 14 CCR § 15021(b).
[83] 14 CCR § 15091(a)(1).
[84] 14 CCR § 15091(a)(2).
[85] 14 CCR § 15091(a)(3).
[86] 14 CCR § 15091(b); *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439, 449.
[87] 14 CCR § 15384(a).
[88] 14 CCR § 15384(b).

not contribute to or are not caused by physical impacts on the environment."[89] The DEIR should be revised and recirculated to incorporate all feasible mitigation measures recommended by Commenters, including undergrounding the entire 70 kV line as the environmentally superior alternative. [90,91]

A. The DEIR Fails to Adequately Analyze Undergrounding the Entire 70 kV Line as a Feasible Alternative

CEQA provides that public agencies should not approve a project if there are feasible mitigation measures that would substantially lessen the significant environmental effects of the project.[92] An agency may reject a mitigation measure if it finds it to be infeasible.[93] A feasible mitigation measure is one that is capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, legal, and technological factors.[94]

The DEIR failed to explain why only a portion of the line was considered for undergrounding when, in fact, undergrounding the whole line is a feasible alternative which would reduce one or more significant impacts to less than significant levels, including aesthetic impacts, which the DEIR asserts are significant and unavoidable. The DEIR states that "[b]ecause of the extremely limited space, some of the new 70 kV line sections would have to be undergrounded using 70 kV solid dielectric cables and pothead structures."[95] This rationale does not explain why undergrounding the entire 70 kV line is not feasible. Commenters recommend that feasible mitigation includes undergrounding the entire 70 kV power line, not just a 1.2 mile portion. It is without question, that an agency need not "adopt every nickel and dime mitigation scheme brought to its attention or proposed in the project EIR," but it must incorporate "feasible mitigation measures" "when such measures would 'substantially lessen' a significant environmental

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[89] 14 CCR § 15384(a).
[90] *Russel Covington, et al v. Great Basin Unified Air Pollution Control District, et al.* (2019) 43 Cal.App.5th 867, 882 ("*Covington").*
[91] Fox Comments, p. 2.
[92] PRC § 21002.
[93] PRC § 21081.
[94] PRC §21061.1; 14 CCR § 15364.
[95] NextEra Transmission West and PG&E Co., Estrella Substation and Paso Robles Reinforcement Project Proponent's Environmental Assessment, Response to Deficiency List No. 4, *available at*: https://www.cpuc.ca.gov/environment/info/horizonh2o/estrella/docs/Estrella%20Def%204%20Response.pdf.

effect."[96] Here, undergrounding the entire 70 kV line would substantially lessen significant impacts to biological resources and fire risk.

We concur with the DEIR that cost is not a sufficient reason to show that the alternative is financially infeasible.[97] CEQA Guidelines Section 15126.6(b) requires consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of the project objectives, or would be more costly".[98] The Court of Appeals determined in *Citizens of Goleta Valley v. Board of Supervisors*, "[t]he fact that an alternative may be more expensive or less profitable is not sufficient to show that the California Public Utilities Commission alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability are sufficiently severe as to render it impractical to proceed with the project."[99] Here, the DEIR contains no evidence demonstrating that the additional cost of undergrounding the 7-mile 70 kV power line would not render the project impractical. The DEIR therefore failed to adequately the infeasibility of undergrounding alternatives PLR-3A and PLR-3B.

1. *Undergrounding Is Feasible*

The DEIR fails to sufficiently demonstrate undergrounding's infeasibility. In *Russel Covington, et al v. Great Basin Unified Air Pollution Control District, et al.*, the court determined the EIR's response to comments was inadequate because the EIR made no attempt to explain whether mitigation measures proposed in public comments to address an impacts which the District's EIR had declared significant and unavoidable were infeasible.[100] The court's holding is consistent with CEQA's statutory requirement that a lead agency cannot declare an impact to be significant and unavoidable unless it first adopts all feasible mitigation to reduce the impact to the greatest extent feasible.[101]

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[96] *San Franciscans for Reasonable Growth v. City and County of San Francisco* (1989) 209 Cal.App.3d 1502, 1519.
[97] DEIR, p. 3-2, 3.
[98] 14 CCR § 15126.6(b).
[99] *Citizens of Goleta Valley v. Board of Supervisors* 197 Cal.App.3d 1167, 1181; see also *Kings County Farm Bureau v. City of Hanford* 221 Cal.App.3d 692, 736.
[100] *Covington* 43 Cal.App.5th at 883.
[101] Pub. Res. Code §21081.
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The DEIR did not determine whether undergrounding the entire 70 kV line was infeasible. Geotechnical investigations by Project proponent were conducted for the Estrella Substation and the 70kV power line.[102] Bedrock was not encountered at any of the boring sites drilled.[103] Undergrounding the entire 70kV line was not considered and DEIR made no attempt to explain whether undergrounding the entire 70 kV line was infeasible. The route of Alternative PLR-3 would follow existing roads, would not exacerbate geologic hazards, and would not bring the project above the 10,000 MT CO_2e/yr.

There is insufficient evidence in the DEIR to establish that undergrounding the entire 70 kV power line is not a feasible mitigation measure. An EIR must contain a sufficient degree of analysis to enable the decisionmakers to make an intelligent and informed decision.[104] The DEIR made no attempt to explain why undergrounding the entire line was not feasible. The DEIR must be recirculated to determine whether undergrounding the entire transmission line is a feasible alternative, and if not, to include substantial evidence supporting a conclusion that undergrounding is not a feasible alternative.

2. *Undergrounding Would Mitigate Biological Impacts*

The DEIR indicates undergrounding the Project's power lines would reduce impacts to special-status birds by reducing the potential for avian collision and electrocutions.[105] In addition, the DEIR indicates undergrounding would substantially reduce the wildfire risk and associated ecological consequences.[106] Nevertheless, the DEIR's analysis of undergrounding is limited to Alternative PLR-3, which would involve undergrounding a relatively short segment of the power line route in the Golden Hill Road area north of SR 46. The DEIR provides the following rationale for Alternative PLR-3:

> Alternative PLR-3: Strategic Undergrounding would involve undergrounding the portion of the Proposed Project's new 70 kV power line which has the greatest potential for aesthetic and other environmental impacts. During scoping for the Proposed Project, and based on CPUC staff and consultant's preliminary analysis of the Proposed Project's potential impacts, it was determined that the portion of the

[102] DEIR, p. 4.7-5.
[103] DEIR, p. 4.7-5.
[104] 14 CCR § 15151.
[105] DEIR, Table 5-1.
[106] DEIR, p. 4.20-18.

> line that passes through the Golden Hill Road area north of SR 46 had the greatest potential for impacts because this area does not have existing aboveground transmission or distribution electrical infrastructure and is an up-and-coming area with new commercial development, recreational uses, and existing single-family residential development.[107]

The benefits of Alternative PLR-3 in reducing the risks of wildfire and avian impacts would be relatively limited because the majority of the Proposed Project's 70-kV route would be above ground, including in areas that currently do not have existing aboveground transmission or distribution electrical infrastructure. The DEIR provides no evidence that the risks of wildfire and avian impacts are greater in the Golden Hill Road area north of SR 46 relative to other portions of the Proposed Project's 70-kV route. Therefore, if the objective of undergrounding is to reduce "aesthetic and other environmental impacts," the CPUC must analyze a Project alternative that involves undergrounding the 70-kV power line along its entire route.[108]

The CPUC recognized the benefits of undergrounding power lines in Rulemaking 00-01-005, in implementing Assembly Bill 1149, on January 6, 2000.[109] The CPUC recognized the benefits of undergrounding include aesthetics, increases in property value, public and worker safety, service reliability, reduction of fire danger, and reduced utility costs. [110] Further, the rulemaking recognized "Increased public and worker safety is another undergrounding benefit. The potential reduction in fatalities and injuries due to contact with overhead facilities, as well as reduction of power outages caused by overhead incidents is a desirable goal."[111] The DEIR should be revised and recirculated to analyze the decrease in adverse biological impacts that would be accomplished by undergrounding the entire transmission line.

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[107] DEIR, p. 3-74.
[108] Cashen Comments, p. 11.
[109] Order Instituting Rulemaking into Implementation of Assembly Bill 1149, Regarding Underground Electric and Communication Facilities (January 6, 2000) pp. 6, *available at*: http://docs.cpuc.ca.gov/word_pdf/RULINGS/5510.doc.
[110] *Id.*
[111] *Id.*

3. *Undergrounding Would Mitigate Fire Risk*

CPUC further recognized that undergrounding may reduce the danger of fire and other threats to life and property.[112] When power lines are near trees, direct contact can start fires (and of course cause outages). Such fires can endanger both lives and property. Further, fallen power poles, and live electric wires can frustrate emergency evacuation; as shown by vivid reports from the Oakland Hills fire.

For the reasons CPUC recognized in enacting Rulemaking 00-01-005, undergrounding in this Project is a preferable alternative to reduce fire risk associated with the 70kV power lines. Tree clearing, or fire retardant coatings would not be sufficient because if there is a lapse in tree clearing direct contact with trees can start fires and endanger public health and safety.

San Diego Gas Electric Company, in conjunction with the California Public Utilities Commission:

> Adopted an ordinance creating an underground district in the area in which both the existing and new electric facilities are and will be located, requiring, among other things, (1) that, where practical and economically feasible, all existing overhead electric high voltage distribution facilities in such district shall be removed, (2) that, where practical and economically feasible, each property served from such overhead electric high voltage distribution facilities shall have installed, in accordance with the Utility's rules for underground service, all electrical facility changes on the premises necessary to receive service from the underground facilities of the Utility as soon as it is available, and (3) authorizing the Utility to discontinue its high voltage overhead service.[113]

This Project's 70 kV line should be undergrounded "in keeping with the [California Public Utilities] Commission's policy of encouraging, and when necessary ordering… utilities' distribution systems to be buried."[114]

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[112] *Id* at 10.
[113] San Diego Gas & Electric, Rule 20 Replacement of Overhead with Underground Electric Facilities (2014) *available at*: http://regarchive.sdge.com/tm2/pdf/ELEC_ELEC-RULES_ERULE20.pdf.
[114] Public Utilities Commission of the State of California, Rules for Construction of Underground Electric Supply and Communication Systems, General Order No. 128, January 2006, *available at*: https://www.sandiego.gov/sites/default/files/52591.pdf.

4. *Undergrounding Would Mitigate Impacts from Electro Magnetic Radiation*

Overhead transmission lines are a source of two fields: the electric field produced by the voltage and the magnetic field produced by the current. CPUC guidance specifically requires that "[t]he construction of a new transmission line will incorporate no-cost and low-cost magnetic field reduction measures. Magnetic field modeling is required."[115] The DEIR failed to discuss these fields and their impacts on sensitive receptors even though the proposed transmission line is within 50 feet of many homes.[116] It also fails to comply with the CPUC design guidelines.

Contrary to assertions in the PEA, significant public health impacts have been consistently documented from exposure to electromagnetic fields, both extremely low-frequency ELF-EMF from sources like power lines and radiofrequency radiation (RFR) in referenced journal articles.[117] These include short- and long-term health impacts, including those discussed in Dr. Fox's Comments.[118,119]

B. The DEIR Lacks Substantial Evidence to Conclude that Alternative Combination #2 is the Environmentally Superior Alternative.

The CPUC identified Alternative Combination #2 as the Environmentally Superior Alternative for this DEIR. Alternative Combination #2 would include Estrella Substation, Alternative PLR-1A, Alternative BS-2, and Alternative BS-3. There is substantial evidence that the proposed alternatives BS-2: Battery Storage to Address Distribution Objective, and BS-3: Third Party, Behind-the-Meter Solar and Battery Storage would increase the Project's significant environmental effects. Commenters urge the CPUC to not select nor approve the Alternatives BS-2, or BS-3.

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[115] California Public Utility Commission, EMF Design Guidelines for Electrical Facilities, Table 3-1, pdf 9, July 21, 2006; https://www.cpuc.ca.gov/General.aspx?id=4879.
[116] PEA, Appendix A.
[117] Fox Comments, p. 85.
[118] *Id.* at 86; Cindy Sage and David O. Carpenter (Editors), BioInitiative Report: A Rationale for Biologically Based Exposure Standards for Low-Intensity Electromagnetic Radiation, BioInitiative Working Group, December 31, 2012, Exhibit13.
[119] Jiguparmar, How HV Transmission Lines Affects Humans and Plants; https://electrical-engineering-portal.com/how-hv-transmission-lines-affects-humans-plants.

Alternative Combination #*2* is not environmentally superior to the Proposed Project because it would have a number of environmental impacts that could be avoided by the Proposed Project. Those impacts include increased fire risk, accidents leading to significant on-site and off-site public health and off-site property damage, and significant increases in criteria pollutant and greenhouse gas emissions.[120] The DEIR lacks substantial evidence to conclude that Alternative Combination #2 is the environmentally superior alternative.

1. *Fire Risk*

Commenters concur with the DEIR that fire risk is associated with the Battery Storage Alternatives BS-2 and BS-3. The DEIR explains that there may be potentially increased fire risk associated with FTM BESS installations, particularly lithium-ion BESSs, and could pose a hazard to fire fighters and other first responders due to their chemical components.[121] But, the DEIR fails to adequately analyze the significant impacts from BESS facilities accidents causing fires to on-site and off-site locations, and property damage worker and public health impacts associated with the release of hazardous air pollutants.

Lithium-ion batteries contain a flammable electrolyte and have the potential for "thermal runaway," which is a self-perpetuating cascade process where one compromised battery cell ignites adjacent cells, potentially resulting in a large-scale fire.[122] Fires have occurred at utility-scale lithium-ion BESS installations, including one at the 2 MW APS McMicken Battery Energy Storage facility in Surprise, Arizona in April of 2019.[123] The McMicken explosion injured four firefighters and destroyed the BESS and its container.[124]

If Alternatives BS-2 or BS-3 are implemented, Dr. Fox recommends that the Project utilize available technologies and design methods to address thermal

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[120] Fox Comments p. 62.
[121] DEIR, p. 4.9-39.
[122] DEIR, p. 4.9-39.
[123] *Id.*
[124] Fox Comments, p. 68, Arizona Public Service, *Technical Support for APS Related to McMicken Thermal Runaway and Explosion: McMicken Battery Energy Storage System Event Technical Analysis and Recommendations.* Available at: https://www.aps.com/-/media/APS/APSCOM-PDFs/About/Our-Company/Newsroom/McMickenFinalTechnicalReport.ashx?la=en&hash=50335FB5098D9858BFD276C40FA54FCE. Accessed December 14, 2020.

runaway propagation.[125] In addition, better practices for ventilation, extinguishing, and cooling thermal runaway scenarios should be implemented in any BESS for this Project. Clean agent or aerosol extinguishing methods should not be the only barrier against thermal runaway, as they were in the McMicken BESS explosion.[126]

The DEIR asserts, without substantial evidence, that flow battery technology, which could be used at FTM Sit 6, "would have reduced fire risk because the electrolyte material is not flammable."[127] However, "reduced fire risk" does not mean the impact would not be significant.[128]

The National Fire Protection Association identified impacts of energy storage systems, which were not adequately analyzed in the DEIR including: 1) Thermal runaway (rapid uncontrolled release of heat energy, resulting in fire or explosion; 2) Shock hazard from stranded energy; 3) Release of toxic and flammable gases; 4) Deep seated fires within metal or plastic casing, blocking firefighting agents; 5) Mechanical abuse; 6) Thermal abuse from exposure to external heat source; 7) Electrical abuse from overcharging; 8) Environmental impacts including rodent damage to wiring extreme heat, and floods.[129]

Dr. Fox describes the serious risks of fires, explosions, and wildfires associated with the proposed BESS facilities.[130] These risks are mentioned, but not analyzed, in the DEIR. The DEIR must be revised and recirculated to adequately analyze the impacts from proposed Alternatives BS-2 and BS-3.

The Final Alternatives Screening Report for this Project states that "fire risk is a concern with BESS installations (particularly lithium-ion BESSs)… should BESS facilities catch fire, they could potentially pose a hazard to fire fighters and other first responders due to their chemical components. These issues will need to be fully evaluated in the EIR…"[131] But the DEIR fails to adequately evaluate

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[125] Fox Comments, p. 64.
[126] *Id.*
[127] DEIR, p. 4.9-39.
[128] Fox comment, p. 51.
[129] NFPA, Fire & Life Safety Policy Institute, Safety Through Better Public Policy, August 2019; https://www.nfpa.org/News-and-Research/Resources/Emergency-Responders/High-risk-hazards/Energy-Storage-Systems.
[130] Fox Comments, p. 48-55.
[131] Estrella Substation and Paso Robles Area Reinforcement Project DEIR Appendix B, Final Alternatives Screening Report, p. 3-73.
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impacts from BESSs. The DEIR fails to analyze these issues in a "risk of upset analysis." CEQA requires that CPUC prepare a risk of upset analysis for Alternatives BS-2 and BS-3 if either alternative is being considered for adoption. Dr. Fox determined that an accident at these facilities would result in significant impacts, including potentially property damage, health impacts from toxic chemicals, and even mortality.[132] The DEIR fails as an informational document under CEQA for failing to analyze and mitigate these risks.

The failure to conduct a risk of upset analysis in the DEIR constitutes impermissibly deferred analysis in violation of CEQA. CEQA Guidelines § 15126.4(a)(1)(B) provide that formulation of mitigation measures shall not be deferred until some future time.[133] "By deferring environmental assessment to a future date, the conditions run counter to that policy of CEQA which requires environmental review at the earliest feasible stage in the planning process."[134] The DEIR must be revised and recirculated to include adequate analysis of the impacts from fire risks associated with BESS facilities.

2. GHG Impacts from BESSs

The DEIR fails to take into account the GHG emissions resultant from operating the proposed BESSs. Batteries in BESS facilities must be charged with energy from the grid.[135] Generation of this energy emits GHGs and criteria pollutants. Further, a BESS requires electricity to operate its ancillary cooling and control systems, including inverters, transformers, and HVAC units.[136] The DEIR did not include emissions from any of these sources. As demonstrated below and by Dr. Fox's comments GHG emissions from the Project are significant and unmitigated.[137]

The DEIR contains no information on the next generation of electricity needed to operate the proposed BESSs. The DEIR is silent on the sources of the charging energy and makes no commitment that the batteries will be charged with renewable energy.[138] As the facility is a net consumer of electricity (to operate support equipment), operation of the Project will increase GHG and criteria

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[132] Fox Comments, p. 67.
[133] 14 CCR 15126.4(a)(1)(B).
[134] *Sundstrom* (1998) 202 Cal.App.3d 296, 305.
[135] Fox Comments, p. 70.
[136] *Id.*
[137] *Id.*
[138] *Id.* at 71.

pollutant emissions to operate the BESS and when the batteries are charged with nonrenewable energy sources, which will occur whenever wind and solar are not available to meet incremental charging loads because they are already being fully used.[139]

The DEIR fails to provide the key information required to estimate charging emissions, including the battery storage efficiency and expected energy output of the batteries. The storage capacity of the various BESS options, the amount of energy the batteries can store, is included in Table 3-18 of the DEIR. However, the expected energy output was not provided. All of this information is required to estimate emissions from Project operation.

The DEIR fails as an informational document under CEQA for failing to calculate direct and indirect GHG emissions from BESS battery charging and for failing to include the information required to calculate these emissions. Because the DEIR does not provide any data on the expected efficiency, capacity factor, or its expected charging energy requirements or energy generation, we used CAISO data for existing energy storage projects. Commenters' expert analysis is summarized in Exhibits 2A and 2B.[140]

VII. THE DEIR FAILS TO ADEQUATELY ANALYZE AND MITIGATE POTENTIALLY SIGNIFICANT IMPACTS TO AGRICULTURAL RESOURCES

The DEIR states that the Proposed Project would permanently convert roughly 15 acres of Important Farmland to non-agricultural uses.[141] Specifically, the DEIR states that the Estrella Substation would be located on an approximately 15-acre portion of a 98.6-acre parcel of land which is currently planted with grape vines of 10-foot-wide span lengths.[142] The DEIR fails to analyze and mitigate temporary and permanent significant impacts to farmland. The impacts to agricultural land from this Project are inconsistent with the San Luis Obispo General Plan Agriculture Element. The DEIR fails to analyze the Project's inconsistency with the General Plan.

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[139] *Id.*
[140] Emission calculations by David Marcus. Calculations in Exhibits 2A and 2B and Marcus resume in Exhibit 3.
[141] DEIR, p. 4.11-17.
[142] DEIR, p. 2-15.

CEQA requires the agency to determine whether the Project would "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."[143]

In 1993, the California State Legislature added a requirement to CEQA that the Resources Agency create an appendix to the CEQA Guidelines.[144] The Legislature required that this appendix propose methods to analyze significant effects on the environment from conversion of agricultural land. The findings for this statutory requirement states that:

(a) Agricultural is the State's leading industry and is important to the State's economy.
(b) The continued productivity of agricultural lands in California is important in maintaining a healthy agricultural economy.
(c) The conversion of agricultural lands to nonagricultural use threatens the long-term health of the State's agricultural industry."[145]

A. The DEIR Fails to Adequately Analyze Impacts to Farmland

The DEIR concludes that the Project would have significant and unavoidable impacts on agricultural resources.[146] The Project would entail the permanent conversion of Important Farmland including Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. Permanent conversion of agricultural land would occur as a result of removal of existing vineyards at the substation site and removal of existing vineyard and row crops for the placement of structures as part of the 70 kV power line route construction.[147] The County of San Luis Obispo Agriculture Element states that it is the policy of the County to preserve agricultural land from development, because "[o]nce agricultural land is

[143] 14 CCR § 15000 Appendix G.
[144] Osha R. Meserve, *Overview of Legal Restraints on Agricultural Land Mitigation Programs,* Prepared for Department of Conservation Division of Land Resource Protection (February 16, 2011) p. 2 *available at:* http://www.caff.org/wp-content/uploads/2010/07/Ag-Mitigation-Handout-2-16-111.pdf.
[145] Section 1 of Stats. 1993, c. 812 (SB 850).
[146] DEIR, p. 4.2-13.
[147] DEIR, p. 4.2-12.

converted to non-agricultural use, it is virtually impossible to remove the non-agricultural use and convert the land back to agricultural production."[148]

1. *Temporary Impacts*

The DEIR states that temporary work for the Substation and staging areas would require "vegetation removal and grading, including grape vines (and roots) and grasses" of approximately 6.2 acres.[149] Mitigation measure AG2 would not be effective mitigation because the impact to farmland is not temporary. Removal of grape vines and roots is not a temporary impact. Grape vines do not reach full production until the third through fifth year, at which time the area could be fully restored.[150]

The Proponent's Environmental Assessment estimated that approximately 96.74 acres of farmland will be temporarily affected during construction of the Estrella Substation and power line route.[151] This information, though, is not present in the DEIR. As discussed above, the court in *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* held "[t]he data in the EIR must not only be sufficient in quantity, it must be presented in a manner calculated to adequately inform the public and decision makers, who may not be previously familiar with the details of the project."[152] Further, "information scattered here and there in EIR appendices or a report buried in an appendix, is not a substitute for a good faith reasoned analysis."[153] The requirement of a detailed analysis ensures that stubborn problems or serious criticism are not "swept under the rug."[154] The extent of temporary impacts to farmland was not adequately analyzed in the DEIR.

The DEIR addresses the temporary impacts as follows:

> "[T]emporary impacts to Prime Farmland, Farmland of Statewide Importance, and Unique Farmland would be significant if agricultural

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[148] *Id.*
[149] DEIR, p. 2-73.
[150] House Comments, p. 4; Jancis Robinson et.al., *The Oxford Companion to Wine,* Third Edition, p. 741-742, Oxford University Press 2006.
[151] PEA, p. 3.2-23.
[152] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 442.
[153] *Id., quoting California Oak Foundation v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219, 1239, *quoting Santa Clarita Organization for Planning the Environment v. County of Los Angeles* (2003) 106 Cal.App.4th 715, 723.
[154] *Cleary v. County of Stanislaus* (1981) 118 Cal.App.3d 348, 357.

uses/crops were not adequately restored following construction and/or if soil productivity were adversely affected over the long term (e.g., due to soil compaction)."[155]

Here, the DEIR recognizes that "temporary" impacts to Farmland may be permanent "if soil productivity were adversely affected over the long term."[156] However, the DEIR mischaracterized the impact here as temporary instead of a permanent conversion of farmland. Agricultural expert Mr. House comments that the lack of specificity as to how temporary impacts will be mitigated "is just a cipher or placeholder to acknowledge that something will need to be done after the construction is completed."[157] This would constitute impermissibly deferred analysis under CEQA Guidelines § 15126.4(a)(1)(B) which provide that formulation of mitigation measures shall not be deferred until some future time.[158]

The DEIR also fails to specify the degree of soil disturbance.[159] The depth of disturbance through excavation or severe compaction may make it impracticable to fully restore the disturbed site to pre-project conditions, and thus the mitigation measures will be insufficient. The DEIR should be revised to fully analyze the depth and degree of disturbance and compaction that will result from the Project.

The DEIR must be revised and recirculated to disclose the temporary impacts that may become permanent, and to require all feasible mitigation necessary to reduce temporary impacts to agricultural land to less than significant levels.

2. *Land Evaluation and Site Assessment*

The DEIR fails to provide a California Land Evaluation and Site Assessment ("LESA") for the Estrella Substation site. The purpose of a LESA is provide agencies and decision makers with a succinct and technically developed methodology to assist with the assessment of the potentially significant effects on

[155] DEIR, p. 4.2-18.
[156] *Id.*
[157] House Comments, p. 2.
[158] 14 CCR 15126.4(a)(1)(B).
[159] House Comments, p. 2.
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the environment related to agricultural land conversions considered in the environmental review process including in CEQA reviews.[160]

The California LESA Model evaluates measures of soil resource quality, a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands.[161] For any given project, the factors are rated, weighted, and combined, resulting in a single numeric score.[162] The final project score becomes the basis for making a determination of a project's potential significance.[163] The California Land Evaluation and Site Assessment (LESA) Instruction Manual (1997) developed by the California Department of Conservation, Office of Land Conservation should be the guidance and instructional document utilized to conduct analysis for this Project.[164]

A revised DEIR must be circulated to adequately analyze impacts to agricultural lands through a LESA Model.

B. The DEIR Fails to Adequately Mitigate Impacts to Farmland

1. Mitigation Measure AG-1

The DEIR in Mitigation Measure AG-1 provides for Compensation for Loss of Agricultural Land through a conservation easement. A conservation easement would not "replace or provide a substitute resource" for the permanent loss of unique farmland as required by CEQA.[165] A conservation easement to "promote the long-term preservation of agricultural lands in California" would not replace the 15.17 acres of Important Farmland on the Estrella Substation Site being converted to nonagricultural use.[166]

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[160] PRC § 21095.
[161] California Department of Conservation, Land Evaluation & Site Assessment (LESA) Model, (2020) available at: https://www.conservation.ca.gov/dlrp/Pages/qh_lesa.aspx.
[162] *Id.*
[163] *Id.*
[164] California Department of Conservation, California Agricultural Land Evaluation and Site Assessment Model: Instruction Manual (1997) *available at*: https://www.conservation.ca.gov/dlrp/Documents/lesamodl.pdf.
[165] CEQA Guidelines § 15370(e); *Friends of Kings River v. County of Fresno* (2014) 232 Cal.App.4th 105,123.
[166] DEIR, p. 4.2-13.

The court in *King & Gardiner Farms, LLC v. County of Kern* determined that:

> "Entering into a binding agricultural conservation easement does not create new agricultural land to replace the agricultural land being converted to other uses. Instead, an agricultural easement merely prevents the future conversion of agricultural land subject to the easement. Because the easement does not offset the loss of agricultural land (in whole or in part), the easement does not reduce a project's impact on agricultural land. Therefore, [the mitigation measure] does not provide effective mitigation for the conversion of agricultural land."[167]

Here, Proposed Mitigation Measure AG-1 does not provide effective mitigation for the conversion of agricultural land because a contribution of funds to the California Farmland Conservancy does not create any new Important Farmland.[168]

The DEIR concludes that impacts from the permanent conversion of agricultural land are significant and unavoidable. However, the DEIR lacks the underlying analysis necessary to support this conclusion, and fails to demonstrate that all feasible mitigation is being implemented. An impact can only be labeled as significant and unavoidable after all available, feasible mitigation is considered. Review of the DEIR demonstrates that the Project fails to consider all feasible mitigation measures that would provide for new agricultural land to offset that which is being permanently converted. "[P]ublic agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects…"[169]

Mr. House concurs with the DEIR's conclusion that a conservation easement at a 1:1 ratio does not fully offset the significant impact because it does not create new Important Farmland.[170] Other California counties with comparably valuable agricultural lands to those that will be disrupted by the Project required notably higher mitigation ratios. In Yolo County, California, a county ordinance requires a

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[167] *King & Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 876.
[168] DEIR, p. 4.2-13.
[169] California Code of Regulation, Title 14, Chapter 3, § 21002.
[170] DEIR, p. 4.2-13.

3:1 ratio when prime agricultural land is converted from agricultural land to nonagricultural land, and 2:1 when converting non-prime farmland.[171] The City of Davis implemented a 2:1 mitigation requirement for changes from agricultural land to nonagricultural land.[172] Mr. House concludes that Mitigation Measure AG-1 should require replanting at a ratio of 3:1 because agricultural land is being converted to nonagricultural use. Mr. House further opines that the compensatory easement(s) should be located within 15 miles of the Project or within San Luis Obispo County, in order to adequately mitigate the loss of agricultural land.

If such land for a compensatory easement is not available, the mitigation measure is inadequate.[173] HWT and PG&E would not be required to identify a specific location, but such a location must actually exist.[174] A satisfactory mitigation measure would be to require HWT and PG&E to purchase the conservation easement with the oversight and approval of the CPUC.[175]

The DEIR states that the amount of HWT's and PG&E's contribution shall be based on the market price for the commensurate land at the time the impacts occur.[176] The DEIR does not define what "commensurate" land means. Mr. House explains that "commensurate" must be defined by metrics such as soil quality, and equivalent supply of water for irrigation, in order to provide substantial evidence to support the selection of mitigation lands. Further, Mr. House explains that the mitigation land should have an equal or better LESA score than the land lost.[177]

The DEIR should be revised to include feasible mitigation measures to reduce permanent impacts to agricultural resources to less than significant levels.

2. Mitigation Measure AG-2

Mitigation Measure AG-2 requires "removing any rock or material imported to stabilize the site, replacement of topsoil, de-compacting any soil that has been

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[171] Yolo County Zoning Code, Chapter 1, Article 4, Section 8-2.404(c)(1).
[172] City of Davis Mun. Code, § 40A.03.025(c): ("Total mitigation for a development project shall not be less than a ratio of two acres of protected agricultural land for each acre converted from agricultural land to nonagricultural land.")
[173] *King & Gardiner Farms* (2020) 45 Cal.App.5th 814, 877-878.
[174] *California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal.App.4th 603,
[175] House Comments, p. 2.
[176] DEIR, p. 4.2-13.
[177] House Comments, p. 1.

compacted by heavy equipment and re-planting agricultural crops."[178] As Mr. House explains, this mitigation measure is inadequate for the following reasons.

First, removal of all the rock that has been imported to stabilize the site is generally economically infeasible.[179] Mr. House determined that "a 95% cleanup job is about the best likely outcome, thus this aspect of the temporary construction will not be fully restored to pre-construction conditions."[180] He concludes that this measure will thus not reduce the impact to a less-than-significant level. The DEIR should be revised and recirculated to fully mitigate the impacts from the introduction of rocks and material to the agricultural land on the Project site.

Second, Mr. House explains that replacement of topsoil "with fresh fill is insufficient to restore the landscape to its original condition."[181] Restoration of the site will take more than one year. HWT and PG&E should provide a plan to monitor the site and continue with restoration practices for two to three years in order to achieve the stated goals of restoring the soil to its pre-project condition.[182] The DEIR's Appendix F Mitigation Monitoring and Reporting Plan should be revised to clarify how long "Following Construction" the measure will be analyzed for effectiveness of restoration.[183] The CPUC should not "[c]onfirm restoration of agricultural lands is completed" until three to five years after construction is complete.

Third, de-compacting the soil on the Project should be done when the soil is dry, because ripping into wet soil "only causes additional damage" according to Mr. House.[184] The disruption of dry soil must take into account impacts to Air Quality from Valley Fever. But decompaction of wet soil may increase greenhouse gas emissions from the Project.

Fourth, GHG Emissions from decompaction of soil are significant and unmitigated. Research suggests that "tillage, soil decompaction after heavy machinery passages…impact not only primary production and soil [organic matter] inputs but also [organic matter] mineralization and therefore soil to atmosphere

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[178] DEIR Appendix F, p. F-14.
[179] House Comments, p. 2.
[180] *Id.*
[181] *Id.*
[182] House Comments, p. 2.
[183] DEIR Appendix F, p. F-14.
[184] House Comments, p. 2.

carbon fluxes."[185] This means, decompaction may release carbon stored in the soil into the atmosphere.[186] These emissions are a significant impact, but the DEIR failed to analyze them.

Further research suggests that "[t]he rapid rewetting of a dry soil often yields a pulse in soil CO_2 production."[187] Additionally, "[t]he drying and rewetting process also releases physically protected soil organic matter, increasing the amount of extractable [carbon] by up to 200%."[188] Soil compaction is also associated with increased risk of erosion and some studies have linked an increase in CO2 following rewetting to mineralization of freshly exposed organic matter, and the subsequent mineralization of microbial carbon.[189] The physical breakdown of soil aggregates, which occurs due to compaction and exposure to rainfall has been associated with increased CO2.[190] The DEIR should be revised and recirculated to analyze the impacts from decompaction of soil on GHG emissions.

Mr. House explains that replanting of agricultural crops may not be fully grown back to the size they were when removed until three to five years after replanting.[191] Grape vines take more than one year to reach crop bearing age.[192] Commenters' agriculture expert Greg House determined that "it is therefore necessary for the mitigation that the act of replanting of the grape vines encompasses the several years (typically 3 to 5 years) it takes to develop mature grape vines.[193] The Mitigation Measure AG-2 should only allow confirmation that restoration of agricultural land is completed, after the 5th year following replanting. Further, the Mitigation Monitoring and Reporting Program must restore the

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[185] Marie-France Dignac et al., *Increasing Soil Carbon Storage: Mechanisms, Effects of Agricultural Practices and Proxies. A Review,* 37 Agronomy for Sustainable Development 14 (2017).
[186] House Comments, p. 2.
[187] Agata Novara et. al., *Effects of Soil Compaction, Rain Exposure and Their Interaction on Soil Carbon Dioxide Emission* 37 Earth Surface Processes and Landforms 994–999 (2012).
[188] *Id.*
[189] *Id.*
[190] Agata Novara et. al., *Effects of Soil Compaction, Rain Exposure and Their Interaction on Soil Carbon Dioxide Emission* 37 Earth Surface Processes and Landforms 994–999 (2012).
[191] House Comments, p. 4.
[192] *Id.*
[193] *Id.*

temporary construction sites to their original slopes and contours for proper surface water drainage.[194]

Finally, the impacts of hazardous waste on the future of agricultural land were not sufficiently analyzed in the DEIR. The monitoring of hazardous substances in the soil should be continued after construction. Monitoring on temporary construction sites should ensure hazardous substances do not remain in the soil after restoration of agricultural land.[195] The DEIR should be revised and recirculated to adequately analyze and mitigate impacts to agricultural resources.

C. Loss of Agricultural Land is Inconsistent with the San Luis Obispo County General Plan Agriculture Element

This Project's impacts to agricultural land conflicts with the San Luis Obispo County General Plan. The County of San Luis Obispo General Plan Agriculture Element provides that "It is the policy of San Luis Obispo County to protect and encourage agricultural operations as stated in the county general plan and in the right-to-farm ordinance."[196] The County determined "it is important to protect agricultural land now" because over 90 percent of the County's "prime" agricultural land, almost all of the "unique" agricultural land, over 60 percent of the lands of "local importance," and lands defined as being of local "potential" are in areas experiencing development activities.[197] The Agriculture Element further provides that "If the protection of agricultural land is not given a high priority now, the industry will not be able to withstand the pressure to convert to other uses and move on…The long-term result will be the loss of productive lands for future generations, as well as the loss of the history and lifestyle that provides the rural character that is San Luis Obispo County."[198]

The CEQA Guidelines require a lead agency conducting environmental review of a project to consider whether the project would "conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over a project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an

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[194] *Id.*
[195] *Id.*
[196] County of San Luis Obispo Agriculture Element (2010) p. 2-9.
[197] County of San Luis Obispo Agriculture Element (2010) p. 2-10.
[198] *Id.*

environmental effect."[199] Here, the CPUC failed to consider that the project conflicts with the Agriculture Element, in violation of CEQA.

The DEIR must be revised to disclose and mitigate the inconsistency with the San Luis Obispo County General Plan Agriculture Element.

VIII. THE DEIR FAILS TO ADEQUATELY DISCLOSE AND MITIGATE POTENTIALLY SIGNIFICANT IMPACTS ON BIOLOGICAL RESOURCES

The failure to provide information required by CEQA is a failure to proceed in the manner required by CEQA.[200] Challenges to an agency's failure to proceed in the manner required by CEQA, such as the failure to address a subject required to be covered in an EIR or to disclose information about a project's environmental effects or alternatives, are subject to a less deferential standard than challenges to an agency's factual conclusions.[201] In reviewing challenges to an agency's approval of an EIR based on a lack of substantial evidence, the court will "determine de novo whether the agency has employed the correct procedures, scrupulously enforcing all legislatively mandated CEQA requirements."[202]

Even when the substantial evidence standard is applicable to agency decisions to certify an EIR and approve a project, reviewing courts will not 'uncritically rely on every study or analysis presented by a project proponent in support of its position. A clearly inadequate or unsupported study is entitled to no judicial deference.'"[203]

A. The DEIR Fails to Analyze and Mitigate Potentially Significant Impacts to Sensitive Vegetative and Riparian Communities

1. *The DEIR Fails to Analyze Potentially Significant Impacts to Sensitive Communities*

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[199] 14 CCR § 15000 Appendix G.
[200] *Sierra Club v. State Bd. Of Forestry* (1994) 7 Cal.4th 1215, 1236.
[201] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 435.
[202] *Id., Madera Oversight Coal., Inc. v. County of Madera* (2011) 199 Cal. App. 4th 48, 102.
[203] *Berkeley Jets*, 91 Cal.App.4th at 1355.
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The DEIR states that "the Proposed Project has been designed to avoid all riparian habitats."[204] This statement is not supported by substantial evidence. The 70 kV power line would cross a number of drainage features[205] that qualify as "riparian areas."[206] The DEIR points to APM HYDRO-1 to justify the statement that: "riparian areas would be avoided and no direct impacts to riparian areas would occur as a result of Proposed Project construction."[207] However, APM HYDRO-1 only requires that permanent structures, staging and work areas, and access roads be sited outside of existing drainage features *to the extent feasible*.

The DEIR does not discuss factors that would make it infeasible to avoid impacts to riparian areas, nor does it explain why it was impractical for the CPUC to conduct the feasibility analysis prior to publication of the DEIR. Because avoidance of riparian areas is contingent on an undefined level of feasibility, it is impossible for the public to understand the likelihood that Project impacts to riparian areas would indeed be avoided. Similarly, because the DEIR does not discuss factors that would make restoration impracticable, it is impossible for the public to understand the likelihood that temporary impact areas would indeed be restored. This issue is compounded by the lack of ecological performance standards for restoration of habitat in temporary impact areas (except those containing blue oak woodland).

2. *The DEIR Fails to Mitigate Potentially Significant Impacts to Sensitive Communities*

The proposed mitigation measure for hydrological impacts, APM HYDRO-1 is not legally enforceable because it states that "permanent structures, staging and work areas, and access roads be sited outside of existing drainage features to the extent feasible."[208] "To the extent feasible" is not binding. Mitigation measures must be fully enforceable through permit conditions, agreements or other legally binding instruments.[209] Failure to include enforceable mitigation measures is

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[204] DEIR, p. 4.4-10.
[205] DEIR, p. 4.4-53.
[206] Riparian areas in the Project area are not limited to the Central Coast cottonwood-willow riparian forest vegetation community discussed in the DEIR. *See definition in* National Research Council 2002. Riparian Areas: Functions and Strategies for Management. Washington, DC: The National Academies Press. p. 3.
[207] DEIR, p. 4.4-51.
[208] DEIR, p. 4.4-10.
[209] Id. at §15126.4(a)(2).

considered a failure to proceed in the manner required by CEQA.[210] In order to meet this requirement, mitigation measures must be incorporated directly into the EIR to be enforceable.[211] The DEIR fails as an informational document for its lack of clear mitigation methods and lack of sufficient data to evaluate the proposed project.[212] The DEIR must be revised and recirculated to mitigate impacts to sensitive vegetative and riparian communities.

B. The DEIR Fails to Adequately Analyze and Mitigate Potentially Significant Impacts to Blue Oak Woodlands

1. The DEIR Fails to Adequately Analyze Impacts to Blue Oak Woodlands

The DEIR states that impacts on blue oak woodland from the Proposed Project would be less than significant with mitigation. But Mitigation Measure BIO-4 is inadequate according to Commenters' expert biologist Scott Cashen to reduce impacts to oak trees to a less than significant level.[213]

The DEIR states, "up to 0.13 acre of direct permanent impacts to blue oak woodlands would occur as a result of pole and tower installation, vegetation removal, and clearing activities. This would include up to three oak trees that would need to be removed for Proposed Project construction. Further, approximately 6.41 acres of blue oak woodlands would be temporarily affected from construction activities."[214]

Mr. Cashen concludes that the DEIR's statement that permanent impacts to oak trees would be limited to removal of "up to three oak trees" is not supported by substantial evidence and does not appear to be accurate. According to Mr. Cashen's analysis, the statement is inconsistent with DEIR Figure 3-7, which depicts numerous locations along the reconductoring segment that would require "oak tree trimming/removal."[215] This suggests the CPUC has yet to determine how many oak

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[210] *San Joaquin Raptor Rescue Ctr. v. County of Merced* (2007) 149 Cal.App.4th 645, 672.
[211] *Lotus v. Dept of Transportation* (2014) 223 Cal. App. 4th 645, 651-52.
[212] *Id.*
[213] Cashen Comments, p. 19.
[214] DEIR, p. 4.4-51.
[215] It is unclear if the proposed alignment (and MRV) for the 70 kV route between the Estrella Substation and North River Road would require additional trimming/removal of oak trees because unlike the detailed maps of the Project alternatives, the detailed map of the Proposed Project does not depict locations requiring oak tree trimming/removal.

trees require removal. Further, it does not appear to account for tree removal activities associated implementation of G.O. 95. Additionally, it does not appear to account for tree removal or mortality in the Project's "temporary" impact areas.

The DEIR must be revised and recirculated to clarify the extent and severity of the Project's tree removal activities.

Further, PG&E's fuel reduction programs can cause significant environmental impacts that were not analyzed in the DEIR. For example, fuels reduction treatments in coastal scrub communities promote invasion by non-native plants and may cause type conversion (i.e., one vegetation type is converted into another vegetation type), especially if the treatments exceed the historical disturbance regime frequency.[216] Therefore, the CPUC and Applicants need to clarify whether a fuel reduction program would (or might) be implemented as part of the Project. If a fuel reduction program might be implemented as part of the Project, the DEIR must disclose and analyze the environmental impacts of that fuel reduction program.

2. The DEIR Fails to Mitigate Potentially Significant Impacts to Blue Oak Woodlands

Temporary impacts disturbed by the Proposed Project would be restored "to the extent practicable, following construction."[217] This is not a sufficient mitigation measure because it is not *enforceable.* CEQA requires enforceable mitigation measures.[218]

In *Save the Agoura Cornell Knoll v. City of Agoura Hills*, the court determined that proposed mitigation measure of replanting trees was not adequate mitigation because "prior attempts to restore oak woodlands have failed."[219] The court cited a September 2016 letter to the City of Agoura Hills Planning Director, the Resources Conservation District of the Santa Monica Mountains that reported: "To date, there have been no successful restorations of oak woodlands. It is relatively easy to plant oak trees, but the extensive ecological network and soils

[216] Keeley JE. 2006. Fire management impacts on invasive plants in the Western United States. Conservation Biology 20(2):375-384.
[217] DEIR, p. 4.4-51.
[218] 14 CCR § 15126.4(a)(2).
[219] *Save the Agoura Cornell Knoll v. City of Agoura Hills* (2020) 46 Cal.App.5th 665, 702.

that make a forest from those trees has been thus far impossible to recreate."[220] Further, the court went on to cite Appellants findings that "[a]ttempts to recreate oak woodlands as mitigation for other developments are often unsuccessful."[221] The court concluded that, based on the record, substantial evidence supported a fair argument that the mitigation measure was inadequate to mitigate the project's impacts to oak trees to a less than significant level.[222]

A case study from northwestern California similarly illustrates why blue oak has difficulty regenerating on sites where oaks were removed.[223] Deciduous trees including blue oak and California black oak on the site, were not regenerating.[224] The study authors determined that deciduous oaks, particularly blue oak, required artificial plantings given shade and protection from browsing for successful restoration.[225] Restoration of a site on the Sierra Foothill Range and Field Station where blue oaks had been completely removed in the 1960s was finally successful after 2 attempts were thwarted by grasshopper and rodent browsing.[226]

The success criterion proposed in MM BIO-4 (i.e., "a minimum of 65 percent survival of woody plantings after 5 years") provides no assurances that the replacement trees are likely to survive, or that they will ever provide structural elements and characteristics comparable to the trees that were removed. The CPUC should not assume blue oak plantings have a reasonable likelihood of replacing impacted trees until the plantings: (a) are at least 10 years old, (b) have reached the sapling stage, and (c) are protected from herbivory by cattle and deer.[227]

The DEIR states that "Blue oak woodland restoration or compensation may be completed at the work area, in the vicinity, or at a conservation bank with a service area that covers the Proposed Project or selected alternative."[228] It does not

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[220] *Id.* at 701.
[221] *Id.*
[222] *Id.*
[223] Brooks, Colin N.; Merenlender, Adina M. 2001 *Determining the pattern of oak woodland regeneration for a cleared watershed in northwest California: a necessary first step for restoration* Ecology. 9(1): 1-12.
[224] *Id.*
[225] *Id.*
[226] Fryer, Janet L. 2007. *Quercus douglasii* Fire Effects Information System, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, Available at: https://www.fs.fed.us/database/feis/plants/tree/quedou/all.html.
[227] Cashen Comments, p. 19.
[228] DEIR, p. 4.4-52.

appear that there exists a conservation bank with a service are that covers the Proposed Project. The court in *King & Gardiner Farms* determined that because there was no evidence in the administrative record that a mitigation bank existed, the measure did not constitute sufficient mitigation under CEQA.[229] Here, the DEIR does not contain substantial evidence showing that there are mitigation banks or preservation programs with a service area that covers the Proposed Project or selected alternative. Therefore, DEIR does not contain substantial evidence to support a finding that participation in a banking program would actually offset the impacts to Blue Oak Woodlands.

The DEIR should be revised and recirculated to ensure the mitigation measures proposed reduce oak woodland impacts to less than significant.

3. *The Project Contravenes the City of El Paso de Robles Oak Tree Preservation Ordinance*

The Paso Robles Oak Tree Preservation Ordinance was enacted for the "preservation of oak trees in order to maintain the heritage and character of the city of El Paso de Robles ("The Pass of the Oaks") as well as preserve the beauty and identify of the community."[230] The removal of oak trees for this Project contravenes the intent of the ordinance.

Even if the Project does comply with the City of El Paso de Robles Oak Tree Preservation Ordinance ("Oak Tree Ordinance"), the impacts are not sufficiently mitigated. The Oak Tree Ordinance only applies to trees that have a dbh of 6 inches or greater, and it only requires replacement at a ratio of 25 percent of the diameter of trees that are removed. In addition, MM BIO-4 only requires 65 percent of the replacement trees to survive beyond 5 years. Thus, MM BIO-4 does not require replacement of small oaks (< 6 inches dbh), but it allows the Applicants to replace large oaks with small ones.[231] Commenters' expert Mr. Cashen determined this would not mitigate the impacts because small oaks do not provide the same ecological values as large ones, and even if the replacement trees survive to maturity (most do not), it would take decades for them replace the ecological values associated with the trees that are removed.[232]

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[229] *King & Gardiner Farms* (2020) 45 Cal.App.5th 814, 877.
[230] El Paso de Robles Code of Ordinances, § 10.01.010.
[231] Under the City's Oak Tree Ordinance, replacement trees may be as small as 1.5-inch (trunk caliper) in size.
[232] Cashen Comments, p. 20.

4. *The DEIR is not in Compliance with the City Paso Robles General Plan Conservation Element*

The Paso Robles General Plan requires the City "Preserve existing oak trees and oak woodlands. Promote the planting of new oak trees."[233] The DEIR fails to recognize that the Project is not consistent with the City of Paso Robles General Plan Conservation Element. CEQA Guidelines require a lead agency conducting environmental review of a project to consider whether the project would "conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over a project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect."[234] The DEIR violates CEQA. The DEIR should be revised and recirculated to analyze and mitigate the inconsistency with the City of Paso Robles General Plan.

C. The DEIR Fails to Analyze and Mitigate Potentially Significant Impacts to Golden Eagle and Other Special Status Birds

The DEIR fails to ensure adequate mitigation for special-status species that are detected during the pre-construction survey. According to the DEIR, buffers would be installed around bird nests. However, mitigation for all other terrestrial wildlife species has been deferred to the pre-construction survey report, which would identify the "anticipated impacts and proposed mitigation." This approach does not comply with CEQA, which prohibits deferral of: (a) the impact assessment; and (b) the mitigation, unless the lead agency establishes specific performance criteria for the mitigation and explains why it was impractical for the lead agency to identify the mitigation in the EIR."

D. The DEIR Fails to Analyze and Mitigate Potentially Significant Impacts to Amphibians

1. *Western Spadefoot and California Red-Legged Frog*

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[233] City of El Paso de Robles General Plan 2003, Conservation Element p. CO-4, *available at*: https://www.prcity.com/DocumentCenter/View/25852/20141119-Conservation-Element.
[234] 14 CCR § 15000 Appendix G.

The DEIR failed to adequately analyze impacts to the Western spadefoot toads. Western spadefoot toads and California red-legged frog ("CRLF") spend majority of the year below ground and are only detectable during a few weeks or months of the year.[235] CRLF that disperse from aquatic habitat seek shelter under objects or in small mammal burrows.[236] Terrestrial movements of both species generally occur at night. Therefore, Mr. Cashen explains that standard preconstruction surveys are not sufficient for detection.[237] The DEIR does not require adequate analysis because the DEIR does not require special survey techniques designed to survey the California Red-legged Frog.[238]

The DEIR states that APM BIO-3 would require exclusion fencing as one of the measures that would ensure CRLF and Western Spadefoot toad individuals are not present during construction. But, neither APM BIO-3 nor MM-BIO-1 require installation of an exclusion fence around construction work areas. Thus, the claim that APM BIO-3 and Mitigation Measure BIO-1 "would ensure that CRLF and western spadefoot toad individuals are not present during these activities, such that they could be directly impacted" is not supported by substantial evidence.[239]

Mr. Cashen explains that the threat of trenches to CRLF and Western Spadefoot was not adequately analyzed in the DEIR. The DEIR states that APM BIO-4 and Mitigation Measure BIO-1 would require that all trenches and excavations in excess of 2 feet deep have a sloped escape ramp or be covered at the end of the day, which would minimize potential for CRLF or western spadefoot toad individuals to become entrapped in Proposed Project construction areas.[240] The threat to CRLF and Western Spadefoot individuals is not limited to trenches in excess of 2 feet deep. Mortality to these species may occur if mitigation is limited to escape ramps and if trenches are not covered.[241] Mr. Cashen determined that inspecting trenches at the beginning of the workday would be effective for CRLF, but would not be effective for Western Spadefoots toads, which burrow under soil during the day.[242]

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[235] Cashen Comments, p. 12.
[236] *Id.*
[237] *Id.*
[238] *See* U.S. Fish and Wildlife Service. 2005 Aug. Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog. 26 pp.
[239] DEIR, p. 4.4-43.
[240] DEIR, p. 4.4-43.
[241] Cashen Comments, p. 13.
[242] *Id.*

E. The DEIR Fails to Mitigate Potentially Significant Impacts from Invasive Plants

The DEIR failed to provide adequate mitigation measures for impacts from invasive plants. Mr. Cashen explains that the best management practices in the California Invasive Plant Council guidelines are feasible and should be incorporated as mitigation measures for this Project.[243] The DEIR does not incorporate any mitigation measures for invasive plants, nor does it establish performance standards for invasive plants in the "restoration" area. As a result, potentially significant impacts associated with the colonization or spread of invasive plants remains unmitigated.

The DEIR provides that after the 5 year monitoring period under Mitigation Measure BIO-2, the mitigation shall have ensured "[l]ess than 5 percent cover of invasive weeds within the restoration area."[244] But the Proponent's Environmental Assessment (PEA) provided a stronger mitigation measure than the DEIR to prevent the spread of invasive plants. The PEA provides "Required construction best management practices (BMPs) will include dust suppression using water or soil binders and vehicle cleaning to prevent the spread of nonnative invasive plant species."[245] The DEIR fails to explain why it proposed less stringent mitigation for invasive plants, when the severity of the impact has not decreased. The CPUC should revise and recirculate the DEIR to require vehicle cleaning and additional mitigation recommended by Mr. Cashen in order to prevent the spread of invasive plants.

IX. THE DEIR FAILS TO ACCURATELY ANALYZE, QUANTIFY, AND MITIGATE POTENTIALLY SIGNIFICANT IMPACTS TO AIR QUALITY

An EIR must fully disclose all potentially significant impacts of a Project and implement all feasible mitigation to reduce those impacts to less than significant levels. The lead agency's significance determination with regard to each impact must be supported by accurate scientific and factual data.[246] An agency cannot

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[243] *Id.*
[244] DEIR, p. 4.4-49.
[245] PEA, p. 3.4-53.
[246] 14 CCR § 15064(b).

conclude that an impact is less than significant unless it produces rigorous analysis and concrete substantial evidence justifying the finding.[247]

Moreover, the failure to provide information required by CEQA is a failure to proceed in the manner required by CEQA.[248] Challenges to an agency's failure to proceed in the manner required by CEQA, such as the failure to address a subject required to be covered in an EIR or to disclose information about a project's environmental effects or alternatives, are subject to a less deferential standard than challenges to an agency's factual conclusions.[249] In reviewing challenges to an agency's approval of an EIR based on a lack of substantial evidence, the court will "determine de novo whether the agency has employed the correct procedures, scrupulously enforcing all legislatively mandated CEQA requirements."[250]

Even when the substantial evidence standard is applicable to agency decisions to certify an EIR and approve a project, reviewing courts will not 'uncritically rely on every study or analysis presented by a project proponent in support of its position. A clearly inadequate or unsupported study is entitled to no judicial deference.'"[251]

A. The DEIR Fails to Adequately Analyze the Project's Potentially Significant Impacts from Construction Emissions

The DEIR violates CEQA Guidelines section 15126.2, subdivision (a), which requires an EIR to "analyze any significant environmental effects the project might cause by bringing development and people into the area affected."[252] The CEQA Guidelines require an EIR identify "relevant specifics of … health and safety problems caused by the physical changes."[253] The DEIR and its appendices make no mention of a health risk analysis (HRA). The DEIR's discussion of health impacts is

[247] *Kings Cty. Farm Bur. v. Hanford* (1990) 221 Cal.App.3d 692, 732.
[248] *Sierra Club v. State Bd. Of Forestry* (1994) 7 Cal.4th 1215, 1236.
[249] *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 435.
[250] *Id., Madera Oversight Coal., Inc. v. County of Madera* (2011) 199 Cal. App. 4th 48, 102.
[251] *Berkeley Jets*, 91 Cal.App.4th at 1355.
[252] 14 CCR § 15126.2(a).
[253] *Id.*

therefore inadequate as a matter of law and the DEIR fails as an informational document.[254]

In *Sierra Club*, the County's failure to include a health risk analysis in the EIR enabled the California Supreme Court to find "the EIR insufficient because it failed to explain why it was not feasible to provide an analysis that connected the air quality effects to human health consequences."[255] Here, the DEIR is likewise insufficient because it fails to connect the Project's air quality impacts with human health consequences.

1. *The DEIR Fails to Conduct a Health Risk Analysis*

The DEIR fails to analyze the health risk posed to sensitive receptors within 1000 feet of the Project's construction zone, in violation of CEQA. In *Sierra Club v. County of Fresno*, the County's failure to include a health risk analysis in the EIR enabled the California Supreme Court to find "the EIR insufficient because it failed to explain why it was not feasible to provide an analysis that connected the air quality effects to human health consequences."[256] Here, the DEIR is likewise insufficient because it fails to connect the Project's air quality impacts with human health consequences. "Without such information, the general public and its responsible officials cannot make an informed decision on whether to approve the project."[257] The DEIR should be revised and recirculated to include a quantified health risk analysis to connect the Project's impacts with human health consequences.

"CEQA requires that an EIR make a reasonable effort to discuss relevant specifics regarding the connection between two segments of information already contained in the EIR, the general health effects associated with a particular pollutant and the estimated amount of that pollutant the project will likely

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[254] *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 519; *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 134 Cal.App.4th 1184, *1220 (*"After reading the EIRs, the public would have no idea of the health consequences that result when more pollutants are added to a nonattainment basin. On remand, the health impacts resulting from the adverse air quality impacts must be identified and analyzed in the new EIRs.").
[255] *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 525.
[256] *Id.*
[257] *Santa Clarita Organization for Planning the Environment* 106 Cal.App.4th 715, 724.

produce."[258] Further, "[t]his discussion will allow the public to make an informed decision, as CEQA requires."[259]

Proponent's Environmental Assessment states "[s]ensitive receptors have been identified with a 1-mile radius of the [Estrella Substation] site, with the nearest residence located within 265 feet of the substation site."[260] Sensitive receptors are within 1,000 feet of the Proposed Project site, and therefore a health risk analysis is required. This omission of this information makes the DEIR's impact analysis inadequate. The DEIR should be revised and recirculated to include a health risk analysis, and, if health risk is found to be significant, to implement all feasible mitigation to reduce impacts to less than significant levels.

Additionally, the DEIR failed to analyze construction-related health risks through a Health Risk Assessment. A Health Risk Assessment is defined in the Health and Safety Code as a type of analysis undertaken in connection with the siting of hazardous substances, "a detailed comprehensive analysis … to evaluate and predict the dispersion of hazardous substances in the environment and the potential for exposure of human populations and to assess and quantify both the individual and population wide health risks associated with those levels of exposure."[261]

The Office of Environmental Health Hazard Assessment ("OEHHA") recommends a formal health risk assessment for construction exposures lasting longer than 2-months, and "[e]xposures from projects lasting more than 6 months should be evaluated for the duration of the project."[262] Here, Proposed Project construction will last longer than 18 months, which is significantly longer than the two-month short-term threshold set by OEHHA to trigger an HRA. Because Project construction will last more than six months, the OEHHA guidance specifies that cancer exposure from Project construction "should be evaluated for the duration of

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[258] *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 521.
[259] *Id.*
[260] PEA, p. 3.3-19.
[261] Health & Saf. Code, § 44306.
[262] Office of Environmental Health Hazard Assessment (OEHHA), Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments, February 2015 (OEHHA 2015), Section 8.2.10: Cancer Risk Evaluation of Short Term Projects, pp. 8-17/18; https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0.

the project."[263] Therefore, CPUC must revise and recirculate the DEIR to include an HRA that quantifies and evaluates the health risks from Project construction.

The DEIR fails to include an HRA to determine the adverse health risk impacts that will be caused by exposure to toxic air contaminants ("TACs") from the Project's construction emissions. The DEIR fails to disclose the potentially significant cancer and asthma risk posed to nearby residents and children from TACs, and fails to mitigate it. Because the DEIR fails to support its conclusion that the Project will not have significant health impacts from diesel particulate matter emissions with the necessary health risk analysis, this finding is not supported by substantial evidence. The DEIR states, "Project construction-related diesel particulate matter and other TAC emissions would not be of a magnitude and duration great enough to result in significant air toxic risks to exposed sensitive receptors."[264] This statement lacks substantial evidence absent the completion of an HRA.

In *Sierra Club v. County of Fresno,* the court rejected the argument that the EIR sufficiently accounted for its lack of specificity by explaining that a Health Risk Assessment is typically prepared later in the CEQA process.[265] The court held, absent a detailed analysis of the Project's health risks, including analysis linking the emissions with human health impacts, the DEIR's discussion of air quality impacts was inadequate. Here, the same standard applies. The CPUC must include a quantified health risk analysis in a revised DEIR to comply with *Sierra Club* and CEQA.

2. *Commenters' Experts Conducted a Health Risk Assessment*

Commenters' experts Dr. Fox and Mr. Marcus conducted a health risk assessment for construction impacts from this Project. Commenters' health risk assessment determined that cancer and acute health impacts from diesel DPM would be significant for on-site construction workers and nearby residents and other sensitive receptors.[266]

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[263] OEHHA 2015 p. 8-18.
[264] DEIR, p. 4.3-18.
[265] *Sierra Club v. County of Fresno* (2018) 6 Cal. 5th 502, 521.
[266] Fox Comments, p. 20.

Dr. Fox determined cancer health risks from Project construction are highly significant, "requiring additional construction mitigation."[267] Dr. Fox further determined that sensitive receptors in the vicinity of the Project will experience significant respiratory impacts.[268] Further, Dr. Fox determined that the California 1-hour NOx standard would be exceeded along the reconductoring line.[269]

The significant health and air quality impacts in the Health Risk Assessment are summarized as follows:[270]

Summary of Maximum Project Level Health Risks				
Risk Metric	Scenario 1	Scenario 2	Significance Threshold	Significant?
Maximum Residential Cancer Risk	0.5 to 40 cancers per million	5 to 75 cancers/million	10 (per million)	Scenario 1 – Yes Scenario 2 - Yes
Maximum Acute Hazard Index from 1-Hour Exposure to DPM	0.1 to less than 0.5	1 to < 4	1.0	Scenario 1 – No Scenario 2 - Yes
Maximum Acute Impact from Exposure to 1-Hour NOx	100 to 500 ug/m^3	00 to 760 ug/m^3	339 ug/m^3	Scenario 1 – Yes Scenario 2 - Yes

The DEIR must be revised and recirculated to disclose these significant health risks and to incorporate additional mitigation to reduce health risk to less than significant levels.

3. *Sensitive Receptors*

The San Luis Obispo County Air Pollution Control District ("SLOCAPCD") states that, if sensitive receptors are within 1,000 feet of the project site, an HRA may be required.[271]

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[267] Fox Comments, p. 26.
[268] *Id.* at 30.
[269] *Id.* at 33.
[270] *Id.* at 35.
[271] "CEQA Air Quality Handbook", SLO County Air Pollution Control District, April 2012, *available at*: https://storage.googleapis.com/slocleanair-

Numerous sensitive receptors are within 1,000 feet of the Project site. The DEIR states that the nearest residence to the Estrella Substation site is approximately 265 feet southwest of the site."[272] Numerous residences are located in proximity to the Project's new 70 kV power line segment. The nearest of these are two residences within 20 feet of the alignment, with another two within 100 feet.[273] The Proponent's Environmental Assessment lists 660 residents within 300 feet of project work areas.[274]

Construction of the Proposed Project's 70 kV reconductoring segment passes through an existing residential area of Paso Robles and would be near numerous sensitive receptors (i.e., residences).[275] The Proposed Project's new 70 kV power line segment would pass adjacent to Barney Schwartz Park and the Paso Robles Sports Club, as well as the Cava Robles RV Resort. Based on aerial imagery, the power line would pass approximately 100 feet west of the nearest RV campsite at the Cava Robles RV Resort.[276] Tots Landing Daycare is located approximately 265 feet east of the reconductoring segment and Grace Baptist Church is located approximately 790 feet east of the reconductoring segment.[277]

The DEIR failed to adequately analyze health risk impacts to these sensitive receptors. Dr. Fox's analysis demonstrates that the impacts are significant and unmitigated. The DEIR must be revised and recirculated to disclose and mitigate impacts to these receptors.

4. *MM AIR-1 Constitutes Impermissibly Deferred Analysis*

Mitigation AIR-1 is inadequate because it constitutes deferred analysis. CEQA Guidelines § 15126.4(a)(1)(B) provide that formulation of mitigation

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org/images/cms/upload/files/CEQA_Handbook_2012_v2%20%28Updated%20Map2019%29_LinkedwithMemo.pdf (SLOAPCD, CEQA Air Quality Handbook).

[272] DEIR, p. 4.13-10; PEA, p. 3.3-19.

[273] *Id.*

[274] Proponent's Environmental Assessment Estrella Substation and Paso Robles Area Reinforcement Project (May 2017) Appendix A. Affected Properties - List of Properties within 300 feet of project work areas sorted by Assessor's Parcel Number (APN) *available at:* https://www.cpuc.ca.gov/environment/info/horizonh2o/estrella/docs/Revised_PEAAppendicesOnly_May2017.pdf.

[275] *Id.*

[276] *Id.*

[277] *Id.*

measures shall not be deferred until some future time.[278] "Impermissible deferral of mitigation measures occur when an EIR puts off analysis or orders a report without either setting standards or demonstrating how the impact can be mitigated in the manner described in the EIR."[279] Here, the DEIR states that a Construction Activity Management Plan ("CAMP") will be prepared, for review and approval by the Air Pollution Control District ("APCD") prior to the start of construction.[280]

"An EIR is inadequate if '[t]he success or failure of mitigation efforts ... may largely depend upon management plans that have not yet been formulated, and have not been subject to analysis and review within the EIR.' "[281] Here, the CAMP would require additional analysis and provide mitigation measures that should have been included for public review in the DEIR. The DEIR fails as an informational document for impermissibly deferred analysis and mitigation.

The CEQA Guidelines provide that "[t]he specific details of a mitigation measure, however, may be developed after project approval when it is impractical or infeasible to include those details during the project's environmental review…"[282] The DEIR does not state why specifying these CAMP performance standards was impractical or infeasible at the time the DEIR was drafted. In *Preserve Wild Santee v. City of Santee,* the city impermissibly deferred mitigation where the EIR did not state why specifying performance standards for mitigation measures "was impractical or infeasible at the time the EIR was certified."[283] The court determined that although the City must ultimately approve the mitigation standards, this does not cure these informational defects in the EIR.[284] Further, the court in *Endangered Habitats League, Inc. v. County of Orange*, held that mitigation that does no more than require a report to be prepared and followed, or allow approval by a county department without setting any standards is inadequate.[285] Here, the fact that the CAMP will be approved later by the APCD does not cure the informational defects in this DEIR.[286]

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[278] 14 CCR 15126.4(a)(1)(B).
[279] *City of Long Beach v. Los Angeles Unified School Dist.* (2009) 176 Cal.App.4th 889, 915-916.
[280] DEIR, p. 4.3-17.
[281] *Preserve Wild Santee v. City of Santee* (2012) 210 Cal.App.4th 260, quoting *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 92, quoting *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645 670.
[282] 14 CCR § 15126.4(a)(1)(B).
[283] *Preserve Wild Santee v. City of Santee* (2012) 210 Cal.App.4th 260, 281.
[284] *Id.*
[285] *Endangered Habitats League, Inc. v. County of Orange,* (2005) 131 Cal.App.4th 777, 794.
[286] *See Cal. Clean Energy Comm. v. City of Woodland* (2014) 225 Cal.App.4th 173, 194.
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5. *Diesel Particulate Matter*

Diesel particulate matter ("DPM") will be emitted from on-road and off-road equipment during Project construction and decommissioning. DPM is a potent human carcinogen.[287] It is also chronically[288] and acutely[289] toxic. OEHHA concluded that "[e]xposure to diesel exhaust can have immediate health effects," which include "inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks."[290]

"The [statewide] risk from diesel PM is by far the largest, representing about 70 percent of the known statewide cancer risk from outdoor air toxics. The exhaust from diesel-fueled engines is a complex mixture of gases, vapors, and particles, many of which are known human carcinogens.[291]

Emissions of DPM from construction equipment could impact construction workers and nearby sensitive receptors. Dr. Fox determined that acute health impacts, which occur over a 1-hour exposure time, are the most likely health risk for this Project.[292] Further, the DEIR is deficient for failing to evaluate cancer and chronic impacts of DPM construction emissions. Short-term emissions of DPM during construction could result in significant cancer and chronic impacts to infants and young children in nearby homes.

The DEIR is deficient for failing to evaluate the acute health impacts of DPM during construction, given the proximity of sensitive receptors to numerous Project components. This impact could be mitigated by requiring the use of all Tier 4 Final

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[287] OEHHA, Health Effects of Diesel Exhaust; https://oehha.ca.gov/media/downloads/calenviroscreen/indicators/diesel4-02.pdf. See also: OEHHA, Diesel Exhaust Particulate; https://oehha.ca.gov/chemicals/diesel-exhaust-particulate#:~:text=Cancer%20Potency%20Information&text=Listed%20as%20Particulate%20Emissions%20from,(ug%2Fm3)%2D1.

[288] OEHHA Acute, 8-hour and Chronic Reference Exposure Level (REL) Summary, June 28, 2016; https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary.

[289] Government of Canada, Human Health Risk Assessment for Diesel Exhaust, March 4, 2016; http://publications.gc.ca/collections/collection_2016/sc-hc/H129-60-2016-eng.pdf.

[290] OEHHA and the American Lung Association of California, Health Effects of Diesel Exhaust; https://oehha.ca.gov/media/downloads/calenviroscreen/indicators/diesel4-02.pdf.

[291] California Air Resources Board, Air Quality and Land Use Handbook: A Community Health Perspective (April 2005), Appendix A, p. A-5.

[292] Fox Comments, p. 31.

construction equipment equipped with diesel particulate traps. The DEIR should be revised and recirculated to require the use of Tier 4 Final construction equipment as binding mitigation.

B. The DEIR's Construction Mitigation is Inadequate

The DEIR provides that construction air quality impacts remain significant and unavoidable after implementation of the Construction Mitigation Plan in Appendix F.[293] The EIR must accurately reflect the net health effect of proposed air quality mitigation measures.[294]

Agencies are required to implement all feasible mitigation measures unless those measures are truly infeasible.[295] The DEIR failed to require all feasible mitigation. The DEIR failed to impose the mitigation measures required by SLOAPCD CEQA Guidelines.

1. The DEIR Does Not Comply with SLOAPCD Standard Mitigation Measures for Construction Equipment

SLOACD CEQA guidance requires the implementation of "standard mitigation measures for construction equipment" when construction emissions exceed significance thresholds,[296] as identified in Dr. Fox's Comment.[297] Mitigation Measure APM AIR-1 in the Mitigation Monitoring and Reporting Plan[298] includes some, but not all, of the standard mitigation measures for construction equipment required to comply with the SLOAPCD CEQA Guidance. The following required mitigation measures were omitted from DEIR Appendix F:

- Diesel idling within 1,000 feet of sensitive receptors is not permitted;
- Staging and queuing areas shall not be located within 1,000 feet of sensitive receptors[299]

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[293] DEIR, Appendix F.
[294] *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 526.
[295] *City of San Diego v. Board of Trustees of California State University* (2015) 61 Cal.4th 945, 967.
[296] SLOAPCD, CEQA Air Quality Handbook, pp. 2-6 to 2-7.
[297] Fox Comment p. 6.
[298] DEIR, Appendix F, p. F-14 to F-16.
[299] SLOAPCD, CEQA Air Quality Handbook, p. 2-3.

These omissions from the DEIR are highly concerning because a substantial portion of Project construction will occur within 1,000 feet of sensitive receptors. DEIR APM AIR-1 requires "All on and off -road diesel equipment shall not idle for more than 5 minutes."[300] This mitigation is insufficient because it will allow up to 5 minutes of idling, where the SLOAPCD CEQA guidelines prohibit any diesel idling with 1,000 feet of sensitive receptors.[301] DPM from idling construction equipment and construction equipment staging and queuing in these areas could result in significant acute health impacts.[302] These omitted SLOAPCD measures must be included as Project mitigation.

Further, the SLOAPCD CEQA guidance requires the following additional diesel idling restrictions to protect public health and air quality that are omitted from the DEIR's Mitigation Monitoring and Reporting Plan in Appendix F:[303]

- Signs that specify the no idling requirements must be posted and enforced at the construction site
- Idling restrictions for on-road vehicles
- Signs must be posted in the designated queuing areas and job sites to remind drivers of the 5 minute idling limits.
- Off-road diesel equipment shall comply with the 5 minute idling restriction
- Signs shall be posted in the designated queuing areas and job sites to remind off-road equipment operators of the 5 minute idling limit.

The DEIR also excludes several required SLOAPCD standard mitigation measures for fugitive dust.[304] The SLOAPCD CEQA Guidance requires "standard mitigation measures for construction equipment" and may require the implementation of a Construction Activity Management Plan (CAMP)[305] when fugitive dust PM10 emissions exceed maximum daily fugitive dust PM10 emissions of 3.04 tons/quarter, as here. For projects with grading areas greater than 4-acres or that are within 1,000 feet of any sensitive receptor, both of which occur for the

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[300] DEIR, p. 2-92.
[301] SLOAPCD, CEQA Air Quality Handbook, p. 2-3.
[302] Fox Comments, p. 15.
[303] SLOAPCD, CEQA Air Quality Handbook, p. 2-3.
[304] SJVAPCD, Summary of Comments and Responses to Proposed Revisions to the GAMAQI-2012, May 31, 2012, p. 3; https://www.valleyair.org/transportation/GAMAQIDRAFT-2012/GAMAQIResponsetoComments5-10-12%20.pdf.
[305] *Id.*, p. 2-6, Section 2.3.

Project, the SLOAPCD CEQA Guidance identifies 14 required fugitive dust mitigation measures.[306]

2. The DEIR Does not Require with Best Available Control Technology for Construction Equipment

The SLOAPCD CEQA guidance requires best available control technology ("BACT") for ROG and NO_x when construction emissions exceed significance thresholds, as identified in Phyllis Fox's Comment. The SLOAPCD CEQA guidance for BACT specifies:

- Further reducing emissions by expanding use of Tier 3 and Tier 4 off-road and 2010 on-road compliant engines;
- Repowering equipment with the cleanest engines available; and
- Installing California Verified Diesel Emissions Control Strategies.[307]

The DEIR relies on the use on the use of Tier 4 construction equipment to reduce the Project significant health risks to less than significant levels, without requiring Tier 4 equipment as binding mitigation. In particular, the DEIR fails to disclose that its construction emission calculations assumed the use of 100% Tier 4 *final* engines in its CalEEMod emissions modeling, which have much lower NOx and ROG emissions than Tier 2, Tier3, or even Tier 4 Interim engines.[308] Thus, "expanding the use of Tier 3 engines" is not mitigation and is not BACT. Rather, it allows higher construction emissions than the already significant construction emissions estimated in the DEIR and does not mitigate significant impacts.[309] The DEIR's conclusion that this significant construction health risk impact will be less than significant with mitigation is therefore unsupported and based on the use of equipment that is not mandated for the Project.

Dr. Fox concludes that APM AIR-2 should be modified to state: "All diesel-powered construction equipment shall use Tier 4 Final construction equipment, to be confirmed on site by the on-site construction supervisor during each day of use."[310] If a Tier 4 final engine is not available for select construction equipment,

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[306] *Id.*, p. 2-9, pdf 21, "Fugitive Dust Mitigation Measures: Expanded List".
[307] *Id.* at p. 2-7; Best Available Control Technology (BACT) for Construction Equipment http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm
[308] Fox Comments, p. 12.
[309] *Id.* at 13.
[310] *Id.*

controls shall be installed on the highest tier equipment available to achieve Tier 4 Final standards. Effective controls include diesel particulate filters for PM2.5 ("DPM")[25] and selective catalytic reduction ("SCR") for NOx.[311] As Dr. Fox notes, Tier 4 Final (2015) construction equipment has significantly lower NOx and ROG emissions than either Tier 3 or "transitional Tier 4" (2011) equipment.[312]

Finally, the DEIR does not disclose the NOx emission factor that was used in the CalEEMod analysis for construction equipment.[313] However, Appendix C, which contains the CalEEMod output, does disclose that Tier 4 Final engines were assumed for all construction equipment.[314] Thus, NOx emissions would be 5 to 8 times higher than reported in Table 4.3-5, requiring substantially more mitigation for NOx than disclosed in the DEIR.[315] Thus, APM AIR-2 does not reduce NOx and ROG emissions, but rather allows a significant increase in NOx and ROG emissions, compared to emissions reported in DEIR Table 4.3-5.[316]

C. The DEIR Fails to Adequately Analyze and Mitigate Fugitive Dust Which Poses a Potentially Significant Risk to Human Health through Valley Fever

Valley Fever is caused by microscopic fungus known as Coccidioides immitis ("CI"), which lives in the top 2 to 12 inches of soil in many parts of the state of California.[317] When soil is disturbed by activities such as digging, grading, or driving, or is disturbed by environmental conditions such as high winds, fungal spores can become airborne and can potentially be inhaled. The infectious dose is very low, typically less than 10 spores.[318] The Centers for Disease Control determined that "as little as one spore may transmit disease."[319]

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311 *Id.*
312 *Id.*
313 *Id.*
314 DEIR, Appendix C, pdf 3: "Construction Off-road Equipment Mitigation—Change to assume all equipment Tier 4 Final." See also Appendix C, pdf 420, 560, 561.
315 Fox Comments, p. 14.
316 *Id.*
317 Cal. Lab. Code § 6709(a).
318 Jennifer McNary and Mary Deems, Preventing Valley Fever in Construction Workers, March 4, 2020, pdf 10; https://www.safetybayarea.com/media/2020-3A.pdf.
319 Centers for Disease Control and Prevention

California Labor Code section 6709 recognized that San Luis Obispo County contains work areas where Valley Fever is highly endemic.[320] Highly endemic means that the annual incidence rate of Valley Fever is greater than 20 cases per 100,000 persons per year.[321] The incidence rate for Valley Fever for San Luis Obispo County are among one of the highest rates in the state.[322] Substantial evidence supports the DEIR's conclusion that "the potential for…Valley Fever infections is high."[323] But, the DEIR fails to adequately analyze impacts to construction workers and nearby sensitive receptors from exposure to Valley Fever. Further, the DEIR erroneously concludes that "[m]itigation measures that reduce fugitive dust will also reduce the chances of dispersing CI spores."[324]

1. The DEIR Fails to Adequately Analyze the Risk from Valley Fever.

Dr. Fox explains that construction workers are at significant risk of developing Valley Fever. However, the potentially exposed population is much larger than construction workers because the non-selective raising of dust during Project construction will carry the very small spores, 0.002-0.005 millimeters ("mm"), into off-site areas, potentially exposing large non-construction worker populations.[325]

Many of the Project components, for example, are adjacent to sensitive receptors, including residential areas, schools, and parks, resulting in significant public health impacts. Valley fever spores can be carried on the winds into surrounding areas, exposing farm and vineyard workers, students at nearby schools, and residents adjacent to many of the construction sites. Valley Fever spores, for example, have been documented to travel as much as 500 miles[326] and, thus, dust raised during construction could potentially expose a large number of

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[320] *Id.* at (b).
[321] *Id.*
[322] DEIR, p. 4.3-9.
[323] *Id.*
[324] *Id.*

[325] Comment by Dr. Phyllis Fox; Schmelzer and Tabershaw, 1968, p. 110; Pappagianis and Einstein, 1978, p. 527 ("The northern areas were not directly affected by the ground level windstorm that had struck Kern County but the dust was lifted to several thousand feet elevation and, borne on high currents, the soil and arthrospores along with some moisture were gently deposited on sidewalks and automobiles as "a mud storm" that vexed the residents of much of California." The storm originating in Kern County, for example, had major impacts in the San Francisco Bay Area and Sacramento).

[326] David Filip and Sharon Filip, Valley Fever Epidemic, Golden Phoenix Books, 2008, p. 24.

people hundreds of miles away. The DEIR failed to identify this significant risk to sensitive receptors.

2. The Mitigation Measures Proposed for Valley Fever Impacts are Inadequate

The DEIR erroneously concludes, with no support, that "[m]itigation measures that reduce fugitive dust will also reduce the chances of dispersing CI spores."[327] Dr. Fox determined that conventional dust control measures such as those included in DEIR Appendix F and in APM AIR-3 are not effective at controlling Valley Fever as they largely focus on visible dust or larger dust particles, the PM10 fraction, not the very fine particles where the Valley Fever spores are found.[328] Thus, Dr. Fox determined implementation of conventional dust control measures will not provide sufficient protection for both on-site workers and the general public.

In order to reduce the Project's potentially significant Valley Fever impacts to the greatest extent feasible, Dr. Fox recommends that the Project include the following measures from the South Coast Air Quality Management District to mitigate fugitive dust:

1) Apply water every 4 hours to the area within 100 feet of a structure being demolished, to reduce vehicle track out.
2) Use a gravel apron, 25 feet long by road width, to reduce mud/dirt track out from unpaved truck exit routes.
3) Apply dust suppressants (e.g., polymer emulsion) to disturbed areas upon completion of demolition.
4) Apply water to disturbed soils after demolition is completed or at the end of each day of cleanup.
5) Prohibit demolition activities when wind speeds exceed 25 mph.
6) Apply water every 3 hours to disturbed areas within a construction site.

[327] DEIR, p. 4.3-9.

[328] *See, e.g.*, Cummings and others, 2010, p. 509; Schneider et al., 1997, p. 908 ("Primary prevention strategies (*e.g.*, dust-control measures) for coccidioidomycosis in endemic areas have limited effectiveness.").

7) Require minimum soil moisture of 12% for earthmoving by use of a moveable sprinkler system or a water truck. Moisture content can be verified by lab sample or moisture probe.
8) Limit on-site vehicle speeds (on unpaved roads) to 15 mph by radar enforcement.
9) Replace ground cover in disturbed areas as quickly as possible.
10) All trucks hauling dirt, sand, soil, or other loose materials are to be tarped with a fabric cover and maintain a freeboard height of 12 inches.[329]

3. Proposed Mitigation Measures Do Not Comport with San Luis Obispo County, California, or Federal Labor Regulations.

In response to Valley Fever outbreaks within San Luis Obispo County, its Public Health Department, in conjunction with the California Department of Public Health, developed recommendations to limit exposure to Valley Fever based on scientific information from the published literature.[330,331] The recommended measures, which failed to control Valley Fever, go far beyond the conventional dust control measures included in the DEIR.[332] Controls recommended to minimize workers' dust exposure and risk of Valley Fever in endemic areas are not required by the DEIR's construction mitigation measures:[333,334]

The California Department of Public Health provides that "Employers can reduce worker exposure by incorporating the following elements into the company's Injury and Illness Prevention Program and project-specific health and safety plans:

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[329] SCAQMD, Fugitive Dust Mitigation Measure Table XI-A, http://www.aqmd.gov/docs/default-source/ceqa/handbook/mitigation-measures-and-control-efficiencies/fugitive-dust/fugitive-dust-table-xi-a.doc?sfvrsn=2.
[330] McNary and Deems, 2020, pdf 16 *et seq*.
[331] California Department of Public Health, Preventing Valley Fever Exposure and Preventing Work-Related Coccidioidomycosis (Valley Fever), June 2012, pp. 4-7; http://elcosh.org/record/document/3684/d001224.pdf. See also Wilken et al., 2015, and Sondermeyer Cooksey et al. (Exhibit --).
[332] DEIR, Appendix F.
[333] CDPH Preventing Work-Related Coccidioidomycosis (Valley Fever) Preventing Valley Fever Exposure, *available at:* http://elcosh.org/document/3684/d001224/preventing+work-related+coccidioidomycosis+(valley+fever).html.
[334] McNary and Deems, 2020, pdf 30-45.

1. Determine if the worksite is in an area where Valley Fever is endemic…
2. Train workers and supervisors on the location of Valley Fever endemic areas, how to recognize symptoms of illness, and ways to minimize exposure. Encourage workers to report respiratory symptoms that last more than a week to a crew leader, foreman, or supervisor.
3. Limit workers' exposure to outdoor dust in disease-endemic areas. For example, suspend work during heavy wind or dust storms and minimize amount of soil disturbed.
4. When soil will be disturbed by heavy equipment or vehicles, wet the soil before disturbing it and continuously wet it while digging to keep dust levels down.
5. Heavy equipment, trucks, and other vehicles generate heavy dust. Provide vehicles with enclosed, air-conditioned cabs and make sure workers keep the windows closed. Heavy equipment cabs should be equipped with high efficiency particulate air (HEPA) filters. Two-way radios can be used for communication so that the windows can remain closed but allow communication with other workers.
6. Consult the local Air Pollution Control District regarding effective measures to control dust during construction. Measures may include seeding and using soil binders or paving and laying building pads as soon as possible after grading.
7. When digging a trench or fire line or performing other soil-disturbing tasks, position workers upwind when possible.
8. Place overnight camps, especially sleeping quarters and dining halls, away from sources of dust such as roadways.
9. When exposure to dust is unavoidable, provide NIOSH-approved respiratory protection with particulate filters rated as N95, N99, N100, P100, or HEPA. Household materials such as washcloths, bandanas, and handkerchiefs do not protect workers from breathing in dust and spores."[335]

Dr. Fox recommends that the CPUC implement each of these measures as additional mitigation measures in a revised DEIR.

Labor Code section 6709 requires employers in counties in which Valley Fever is highly endemic to provide training on Valley Fever "before an employee

[335] CDPH Preventing Work-Related Coccidioidomycosis (Valley Fever) Preventing Valley Fever Exposure, *available at:* http://elcosh.org/document/3684/d001224/preventing+work-related+coccidioidomycosis+(valley+fever).html.

begins work that is reasonably anticipated to cause exposures to substantial dust disturbance." The training required by Labor Code section 6709 includes "[p]ersonal and environmental exposure prevention methods that may include, but are not limited to, water-based dust suppression, good hygiene when skin and clothing is soiled by dust, limiting contamination of drinks and food, working upwind from dusty areas when feasible, wet cleaning dusty equipment when feasible, and *wearing a respirator when exposure to dust cannot be avoided*."[336] The DEIR fails to mention wearing a respirator, or any type of respiratory protection while on the construction site, a condition required by other laws applicable to the Project.[337]

The United States Department of Labor Occupational Safety and Health Administration ("OSHA") requires that a respirator "shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program, which shall include the requirements outlined in paragraph (c) of this section. The program shall cover each employee required by this section to use a respirator."[338]

Dr. Fox recommends that the Project implement a mandatory respiratory protection program that requires National Institute for Occupational Safety and Health ("NIOSH")-approved respirators be worn while performing or in the near vicinity of job activities that create airborne dust.[339] NIOSH approved respirators are necessary because "Household materials such as washcloths, bandanas, and handkerchiefs do not protect workers from breathing in dust and spores."[340] The DEIR, APM AIR-3, and MM AQ-1 should be revised and recirculated to include these feasible mitigation measures.

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[336] *Id.*
[337] See PRC § 21002.1(c) (project with significant and unavoidable impacts may not be approved unless otherwise permissible under applicable laws and regulations).
[338] 29 C.F.R. § 1910.134(a)(2) (2006).
[339] Phyllis Fox Comment Letter
[340] CDPH Preventing Work-Related Coccidioidomycosis (Valley Fever) Preventing Valley Fever Exposure, *available at:* http://elcosh.org/document/3684/d001224/preventing+work-related+coccidioidomycosis+(valley+fever).html.
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4. DEIR Dust Control Mitigation Measures (APM AIR-3) Are Inadequate to Control Valley Fever

Commenters' expert analysis determined that none of the mitigation measures in APM AIR-3 will significantly control Valley Fever spores, as discussed below and in Dr. Phyllis Fox's comments. [341,342]

a. APM AIR-3: Reduce the Amount of the Disturbed Area Where Possible

The DEIR requires that the amount of disturbed area should be reduced "where possible."[343] Valley Fever can only be controlled by eliminating disturbed areas. This is clearly not feasible at an active construction site. Instead, dust suppressants, such as polymer emulsions, should be applied to disturbed areas upon completion of disturbance, e.g., demolition.[344] Further, ground cover should be replaced "as quickly as possible" in disturbed areas.[345]

This mitigation measure violates CEQA. CEQA requires mitigation measures be enforceable through binding conditions. Without determining which disturbed areas can be reduced "where possible", it is impossible to verify that the mitigation is achievable.

CEQA prohibits deferring identification of mitigation measures when there is uncertainty about the efficacy of those measures.[346] An agency may only defer formulation of mitigation measures when there is a clear commitment to mitigation that will be measured against specific performance criteria.[347] Since the proposed

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[341] South Coast Air Quality Management District (SCAQMD), Fugitive Dust, Fugitive Dust Table XI-A; http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust.
[342] Western Governors" Association, WRAP Fugitive Dust Handbook, September 7, 2006 (WRAP Handbook); https://www.wrapair.org/forums/dejf/fdh/.
[343] DEIR, p. 2-93.
[344] SCAQMD, Table XI-A.
[345] SCAQMD, Table XI-A.
[346] 14 C.C.R. § 15126.4(a)(1)(B); *City of Marina v. Board of Trustees of the California State University* (2006) 39 Cal.4th 341, 366; *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 308–309.
[347] 14 C.C.R. § 15126.4(a)(1)(B); *City of Marina v. Board of Trustees of the California State University* (2006) 39 Cal.4th 341, 366; *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 308–309. 56 *POET, LLC v. California Air Res. Bd.* (2013) 218 Cal.App.4th 681, 736, 739–740, as modified on denial of reh'g (Aug. 8, 2013), review denied (Nov. 20, 2013); see also *Preserve Wild Santee v. City of Santee* (2012) 210 Cal.App.4th 260, 281 (EIR deficient for failure to specify performance standards in

measure is not enforceable and lacks specific performance criteria that defines "where possible", or that reduction of disturbed areas is even feasible, this measure violates CEQA and the DEIR fails to support with evidence that impacts will be mitigated below the threshold of significance.

b. APM AIR-3: Use Water Trucks or Sprinkler Systems to Prevent Airborne Dust from Leaving the Site.

This measure requires the "use water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site." This is too general to be implemented and enforced. CEQA requires an EIR identify mitigation measures which are both effective and enforceable. "Effective" means the measures can reasonably be expected to avoid or reduce a potential significant impact.[348] "Enforceable" means the measures are stated as conditions of approval in a permit, agreement or other legally binding document or incorporated into a plan, policy, regulation, or project design.[349]

APM AIR-3 would allow water trucks to drive along roads once a day or less frequently without accessing off-road areas where soil is being disturbed. Dr. Fox explains that this is inadequate to reduce impacts, and recommends that, at a minimum, water should be applied every 4 hours within 100 feet of a structure being demolished, every 3 hours to disturbed areas and to disturbed soils after demolition is completed, and at the end of each day of cleanup.[350] Soil should be wet both before and while digging and workers should stay upwind of digging, when feasible.[351] Sprinkler systems should be specified for areas inaccessible by water trucks. Further, Dr. Fox recommends that watering frequency should be increased when wind speeds exceed levels known to raise dust in the local area, typically around 15 mph at the Project site. An on-site wind measuring station should be required to monitor wind speed.[352]

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plan for active habitat management of open space preserve).
[348] 14 CCR § 15126.4(a)(1)(A).
[349] 14 CCR § 15126.4(a)(1)(A).
[350] Fox Comments, p. 62; SCAQMD, Table XI-A and WRAP Handbook, Table 3-7.
[351] Fox Comments, p. 62; CDPH, Preventing Valley Fever in Construction Workers, pdf 44; https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/CDPH%20Document%20Library/CDPH-VF-Webinar-Slides.pdf.
[352] Fox Comments, p. 62. SCAQMD, Table XI-A.
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This measure does not specify a method to verify that the use of water trucks prevents airborne dust from leaving the site. Dr. Fox recommends that real time monitoring for tiny Valley Fever spores should be required at all construction site boundaries.[353]

This measure also fails to address ground areas that are planned to be reworked at dates more than one month after initial grading. These areas should be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established. All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods.

X. THE DEIR FAILS TO ACCURATELY ANALYZE, QUANTIFY, AND MITIGATE POTENTIALLY SIGNIFICANT IMPACTS FROM GREENHOUSE GAS EMISSIONS

CEQA requires the lead agency to use scientific data to evaluate GHG impacts directly and indirectly associated with a project.[354] The analysis must "reasonably reflect evolving scientific knowledge and state regulatory schemes."[355] In determining the significance of GHG emission impacts, the agency must consider the extent to which the project may increase GHG emissions compared to the existing environmental setting and the "extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions."[356]

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[353] Fox Comments, p. 62.

[354] See 14 C.C.R. § 15064.4(a) (lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project); 14 C.C.R. § 15064(d) (evaluating significance of the environmental effect of a project requires consideration of reasonably foreseeable indirect physical changes caused by the project); 14 C.C.R. § 15358(a)(2) (defining "effects" or "impacts" to include indirect or secondary effects caused by the project and are "later in time or farther removed in distance, but are still reasonably foreseeable" including "effects on air"); CEQA Guidelines, Appendix G, § VIII: Greenhouse Gas Emissions (stating agencies should consider whether the project would "generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.").

[355] 14 C.C.R. § 15064.4(b); see also *Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504 (holding that lead agencies have an obligation to track shifting regulations and to prepare EIRs in a fashion that keeps "in step with evolving scientific knowledge and state regulatory schemes").

[356] 14 C.C.R. § 15064.4(b)(1); (3).

A. The DEIR Fails to Adequately Analyze GHG Impacts

The DEIR concludes that the Project's GHG impacts would be less than significant without mitigation.[357] The DEIR further states the impacts are negligible and substantially lower than the SLOCAPCD's operational significance thresholds.[358] DEIR Table 4.8-1 indicates that the major source of GHG emissions is construction, primarily "ground-based construction" (2,025 MT CO_2e) and helicopter emissions (699 MT CO_2e).[359] A secondary source of operational emissions is sulfur hexafluoride (SF_6) from Project equipment (96 MT CO_2e).[360] Dr. Fox concludes that these emissions are underestimated and exclude the major source of Project GHG emissions, operation of the BESS facilities. The DEIR fails as an informational document by failing to provide accurate modeling of the GHG impacts.

1. *Operational GHG Emissions*

The Project will emit three sources of GHG emissions: (1) sulfur hexafluoride (SF6) used in Project equipment; (2) helicopters used in construction of power lines; (3) charging of BESSs.[361] The DEIR fails to support its analysis of the SF6 emissions and omits the latter two sources of emissions from its analysis. These informational deficiencies violate CEQA.

Dr. Fox and Mr. Marcus determined that the net operational emission increases from the Project are: 60.93 tons of CO2e per year; 0.48 pounds of SO2 per year; and 4.30 pounds of NOx per year.[362] The proposed Project as submitted to the CPUC included provisions for three new distribution circuits with a total load-serving capacity of approximately 28 MW. While the DEIR admits that there will be no need for these circuits through at least 2029, based on the current Paso Robles DPA load forecast,[363] it also says that PG&E anticipates needing new distribution capacity within 15 years. Assuming that there would eventually be 28 MW of new storage built in lieu of the proposed new distribution circuits from the Estrella substation, and assuming that storage would operate comparably to

[357] DEIR, pp. 4.8-6.
[358] DEIR, p. 4.3-18.
[359] DEIR, p. 4.8-4.
[360] DEIR, Table 4.8-1, pdf 407.
[361] Fox Comments, p. 81.
[362] Fox Comments, p 73.
[363] DEIR, p. 2-12, Table 2-5.

existing storage during the great majority of hours when it was not being dispatched to meet local reliability needs, Dr. Fox and Mr. Marcus conclude that the total incremental GHG emissions attributable to the Project would be 28 times the annual emissions of 60.93 tons of CO_2e per MW calculated above, or **1,552 MT CO_2e/yr**.[364] Similarly, they conclude that the NOx emissions attributable to the Project would be 28 times the annual emissions of 4.30 lb/yr calculated above, or **120.4 lb/yr**.[365] These emissions are significant and unmitigated. A revised DEIR must be circulated to disclose these significant GHG emissions and mitigate the impacts from increased emissions.

B. The DEIR Fails to Include Adequate GHG Mitigation Measures

The DEIR fails to adopt all feasible mitigation measures to reduce the Project's significant greenhouse gas ("GHG") impacts to less than significant levels before declaring the impacts "significant and unavoidable." This violates CEQA's requirement that "lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring and reporting, of mitigating the significant effects of greenhouse gas emissions."[366] In *Russel Covington*, the court determined the EIR was deficient due to its conclusory responses to comments proposing specific mitigation measures to address fugitive emissions of Reactive Organic Gas ("ROG") that exceeded the threshold of significance, and because its rejection of those proposed measures was not supported by substantial evidence or reasoned explanation showing they were infeasible.[367]

Before it can approve the Project, the CPUC must certify the Project's Final EIR and make mandatory CEQA findings. Those findings must include (1) that the Final EIR complies with CEQA, (2) that the City has mitigated all significant environmental impacts to the greatest extent feasible, and (3) that any remaining significant environmental impacts are acceptable due to overriding considerations.[368] Where, as here, the Project will have a significant effect on the environment, the CPUC may not approve the Project unless it finds that it has "eliminated or substantially lessened all significant effects on the environment

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[364] Total GHG emissions from operating the BESSs = (60.93 ton/yr/MW)*28 MW*(0.91 MT/ton) = **1,552 MT/yr.**
[365] Fox Comments, p. 86.
[366] 14 CCR § 15126.4(c).
[367] Covington, 43 Cal.App.5th at 867.
[368] 14 CCR sections 15090, 15091.

where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns."[369]

The DEIR estimates that the Project's operational GHG emissions would be negligible and substantially lower than the SLOCAPCD's operational significance thresholds. The DEIR deemed these impacts less than significant.

The DEIR states that like the Project, GHG emissions from Alternatives would be largely one-time, construction-related emissions. The DEIR determined that total construction emissions would be 2,6724 metric tons of carbon dioxide equivalents ("MT CO_2e"). The total annualized emissions would be 187 MT CO_2e. ROG and NO_x emissions would exceed significance thresholds, even with implementation of Mitigation measure AIR-1, and the impact remains significant and unavoidable.

Commenters reviewed the Project's proposed GHG mitigation measures, and concluded that the DEIR fails to require all feasible mitigation available to reduce the Project's GHG impacts.[370]

The DEIR must be revised and recirculated to consider alternative mitigation measures and incorporate all feasible measures identified as binding mitigation for the Project. Only if the Project's GHG impacts remain significant after requiring all such feasible mitigation can the CPUC consider declaring the Project's GHG impacts to be significant and unavoidable.

XI. THE DEIR FAILS TO ADEQUATELY ANALYZE, QUANTIFY AND MITIGATE SIGNIFICANT IMPACTS FROM NOISE

The DEIR deemed impacts from helicopter noise significant and unavoidable. Mitigation measures are insufficient to reduce noise levels to those allowed under the San Luis Obispo County General Plan Noise Element.[371] Unlike construction noise, helicopters noise is not exempt from the County of San Luis Obispo noise regulations.[372]

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[369] PRC § 21081; 14 CCR § 15092(b)(2)(A) & (B).
[370] Fox Comments, p. 87-88.
[371] County of San Luis Obispo General Plan, Noise Element, May 1992, Resolution 92-227.
[372] San Luis Obispo County, CA Noise Ordinance § 23.06.042.

Noise sensitive receptors in proximity to the Project site and distribution line segment include numerous residences and a recreation area, the Hunter Ranch Golf Course.[373] Sensitive receptors within 1,427 feet of helicopter landing zones or pole installation sites would be subjected to noise levels exceeding the FTA's recommended significance threshold.[374] Likewise, all sensitive receptors along or within 1,304 feet of the flight path would be subject to level flight noise in excess of 90 dBA.[375] The most severe impacts associated with helicopter activities would be those along the reconductoring segment, where there are numerous residences in close proximity to the existing 70 kV power line and construction work areas.[376]

There are numerous residences within 50 feet of the potential work areas for the reconductoring segment. There are residences as close as 100 feet to planned helicopter landing zones and helicopters operating above pole installation locations could be as close as about 250 feet to residences.[377] At this distance, helicopter noise levels could be in range of about 83 to 87 dBA.[378] Ground level idling is below 90 dBA at all distances.[379] Helicopter activities may occur approximately 132 days during the 18-month construction period for the substation and the 70 kV power line.[380]

As stated previously, before it can approve the Project, the CPUC must certify the Project's Final EIR and make mandatory CEQA findings. Those findings must include (1) that the Final EIR complies with CEQA, (2) that the City has mitigated all significant environmental impacts to the greatest extent feasible, and (3) that any remaining significant environmental impacts are acceptable due to overriding considerations.[381] Where, as here, the Project will have a significant effect on the environment, the CPUC may not approve the Project unless it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns."[382]

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[373] DEIR, p. 4.13-25.
[374] DEIR, p. 4.13-17.
[375] DEIR, p. 4.13-17.
[376] DEIR, p. 4.13-17.
[377] PEA, 3.12-20.
[378] *Id.*
[379] DEIR, p. 4.13-17.
[380] DEIR, p. 2-78.
[381] 14 CCR sections 15090, 15091.
[382] PRC § 21081; 14 CCR § 15092(b)(2)(A) & (B).

The DEIR did not detail why operating helicopters in close proximity to noise-sensitive receptors is unavoidable. The DEIR merely states that "[n]o other feasible mitigation is available to reduce these impacts" to a less-than-significant level.[383] This statement is conclusory and lacks substantial evidence to support it. The DEIR fails as an informational document because it does not sufficiently analyze, mitigate, or consider alternatives to helicopter use during construction.

XII. THE DEIR FAILS TO ADEQUATELY ANALYZE CUMULATIVE IMPACTS

CEQA requires an EIR's cumulative impacts analysis evaluate the incremental impact of the project in conjunction with, or collectively with, other closely related past, present, and reasonably foreseeable probable future projects.[384] "Cumulative impacts" are defined as "two or more individual effects, which, when considered together, are considerable or which compound or increase other environmental impacts."[385] The purpose of this requirement is to avoid "piecemeal" approval of projects without consideration of the total environmental effects the project would have when taken together.[386] The adequacy of an EIR's discussion of cumulative impacts is determined by standard of practicality and reasonableness.[387]

A. The DEIR Fails to Adequately Analyze Cumulative Agricultural Impacts

The DEIR correctly determines that the Project would have significant cumulative impacts on the loss of important farmland in San Luis Obispo County.[388] However, the cumulative impacts analysis is inadequate because it is too general. "The analysis should not be so general that the potential combined impacts of the project and a key nearby project are not disclosed."[389] In *City of Long Beach v. City of Los Angeles,* the court held that the fact that "CEQA does not require quantified

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[383] DEIR, p. 4.13-18.
[384] 14 CCR § 15355(b); *City of Long Beach v. Los Angeles Unified School Dist.* (2009) 176 Cal.App.4th 889, 905.
[385] 14 CCR § 15355.
[386] Cecily Talbert Barclay and Matthew S. Gray, California Land Use and Planning Law (Solano Press, 37th ed. 2020) p. 180.
[387] *Environmental Protection & Information Center v. California Dept. of Forestry & Fire Protection* (2008) 44 Cal.4th 459, 525; 14 CCR § 15130(b).
[388] DEIR, p. 6-21.
[389] *City of Long Beach v. City of Los Angeles* (2018) 19 Cal.App.5th 465, 490.

analysis does not mean that all meaningful information on a subject can be omitted from an EIR's cumulative impacts analysis."[390] Here, the DEIR is inadequate because it omits meaningful information to determine the cumulative impact on agricultural resources.

The DEIR only includes the Paso Robles Gateway Project. The DEIR fails to list any other projects that might have a cumulative impact on conversion of important farmland. CEQA Guidelines section 15130 require that an adequate cumulative impact analysis include a list of the projects producing related or cumulative impacts, a summary of the expected environmental impacts from those projects and a reasonable analysis of the cumulative impacts of the relevant projects.[391] When using a list approach, the EIR should define the relevant area affected and provide a reasonable explanation for the geographic limitation used.[392] The DEIR does not clarify why projects farther than 0.8 miles away were not included in cumulative impacts, where the loss of agricultural resources in San Luis Obispo County cumulatively impacts the whole County. The DEIR's explanation that only projects within the "Activity Area" were considered is insufficient. "Activity Area" includes the immediate areas in which physical actions that are part of the Proposed Project, reasonably foreseeable distribution components and alternatives would take place. The geographic limitation is not sufficient to explain why the loss of important farmland was not determined to be the entire County of San Luis Obispo. The DEIR should be revised and recirculated to address cumulative impacts with a larger geographic limitation or provide a reasonable explanation for the geographic limitation chosen. The DEIR should be revised in accordance with the California Supreme Court's holding in *Laurel Heights Improvement Association v. Regents of University of California*, that an EIR must be recirculated when the draft EIR was so fundamentally inadequate and conclusory that meaningful public review and comment were precluded.[393]

Further, the DEIR states that the impact from "other changes in the existing environment that, because of their location or nature, could result in conversion of Farmland to nonagricultural use" is less than significant.[394] This statement is not

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[390] *City of Long Beach v. City of Los Angeles* (2018) 19 Cal.App.5th 465, 490.
[391] *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 729.
[392] *Cecily Talbert Barclay and Matthew S. Gray, California Land Use and Planning Law (Solano Press, 37th ed. 2020) p. 181.*
[393] *Id.* at 190; *Laurel Heights Improvement Association v. Regents of University of California* (1992) 6 Cal. 4th 1112, 1114.
[394] DEIR, p. 4.2-15.

supported by substantial evidence. The DEIR further states that "with increasing urbanization and development, there is potential for loss of Farmland to non-agricultural uses."[395] This impact should not be deemed less than significant.

B. The DEIR Fails to Adequately Analyze Cumulative Biological Impacts

The DEIR concludes that "[t]he Proposed Project, reasonably foreseeable distribution components, and alternatives would not make a cumulatively considerable contribution to this significant cumulative impact. The contribution of the Proposed Project, reasonably foreseeable distribution components, and alternatives cumulative impact would be less than significant with mitigation."[396] This statement does not comport with the substantial evidence in the DEIR that provides: 1) the Project would result in significant impacts on a suite of sensitive biological resources;[397] 2) impacts from the Proposed Project (and all alternatives), in combination with impacts from other projects, would result in a significant cumulative impact on biological resources;[398] 3) there is potential for the Project to have a cumulatively considerable incremental contribution to the significant cumulative impact.[399]

The DEIR provides that the Project's significant impacts would be reduced to a less-than-significant level with implementation of the APMs and mitigation measures identified in Section 4.4 of the DEIR and these measures would ensure that impacts on protected species, communities, and habitats are reduced to a level that would protect their continued existence.[400] The APMs and mitigation measures are designed to reduce significant impacts not eliminate the impacts entirely.[401]

Mr. Cashen determined that there would be residual impacts after implementation of all APMs and mitigation measures.[402] For example, because the DEIR's compensatory habitat requirement is limited to impacts to blue oak

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[395] DEIR, p. 4.2-15.
[396] DEIR, p. 6-22.
[397] DEIR, p. 6-22.
[398] DEIR, p. 6-22.
[399] DEIR, Table 6-3.
[400] DEIR, p. 6-22.
[401] Cashen Comments, p. 14.
[402] Cashen Comments, p. 14.

woodland, there would be residual impacts to special-status species associated with grasslands and agricultural lands.[403] Similarly, there may be residual impacts on the golden eagle and other special-status birds because the DEIR does not require compensatory mitigation for fatalities caused by electrocutions and collisions with the new power line facilities.[404] Whereas these residual impacts may not rise to the level of significance at the Project-level, they may be significant at the cumulative level when combined with the residual impacts of other projects.[405] For example, the DEIR notes that the impact on avian fatalities would not be limited to the Project, but rather, that the Project would incrementally increase a fatality risk that already exists in the area.[406] The Project's contribution to this potentially significant cumulative impact is cumulatively considerable because it would place seven miles of new power lines in an area that supports foraging raptors, and that has multiple golden eagle nests.[407]

Mr. Cashen determined that none of the DEIR's biological resource mitigation measures are designed to alleviate the cumulative impact. The APMs and mitigation measures to not address potentially significant cumulative impacts, and CPUC's conclusion that the Project's contribution to those cumulative impacts would be less than cumulatively considerable is not supported by substantial evidence.

XIII. THE DEIR FAILS TO ADEQUATELY ANALYZE SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

A. The DEIR Fails to Adequately Analyze Significant Irreversible Agricultural Impacts

The Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural use is a significant irreversible environmental change. The loss of agricultural land beneath the substation is an irreversible environmental change under Section 15126.2(d) of the CEQA Guidelines. This change "generally commits future generations to similar uses."[408] The Project also involves uses that may cause "irreversible damage…from

[403] *See* DEIR, Table 4.4-1.
[404] Cashen Comments, p. 14.
[405] Cashen Comments, p. 14.
[406] DEIR, p. 4.4-50.
[407] DEIR, Table 4.4-1.
[408] 14 CCR § 15126.2(d).

environmental accidents associated with the project."[409] Significant irreversible changes were not considered in the DEIR with respect to agricultural impacts. The DEIR should be revised and recirculated to include impacts to agricultural resources as a significant irreversible agricultural impact from the Proposed Project, Alternatives PLR-1A, PLR-1C, and SE-PLR-2.

B. The DEIR Fails to Adequately Analyze Significant Irreversible Impact from Hazards

The DEIR fails to adequately analyze impacts from battery handling and transportation accidents and battery disposal. Dr. Fox determined that transportation of batteries could result in crush or puncture damage, possibly leading to the release of electrolyte material along transport routes or in storage.[410] Dr. Fox further determined that such releases would result in significant irreversible changes because irreversible damage could result from a potential environmental accident associated with the Project.[411] The DEIR provides that "significant irreversible changes from accidents are not expected."[412] This statement is not supported by substantial evidence.

CEQA Guidelines Section 15126.2(d) requires discussion of "significant irreversible environmental changes which would be caused by the proposed project should it be implemented."[413] The CEQA Guidelines provide further that "irreversible damage can result from environmental accidents associated with the project."[414]

Lithium-ion batteries are sensitive to damage, especially during handling and transport.[415] They are also sensitive to high ambient temperatures,[416] which will be experienced by the Project's batteries as they will likely have to pass through sensitive biological habitat. Battery accidents frequently occur during handling,

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[409] *Id.*
[410] Fox Comments, p. 60.
[411] 14 CCR § 15126.2(d); DEIR, p. 6-2.
[412] DEIR, p. 6-3.
[413] 14 CCR § 15126.2(d).
[414] 14 CCR § 15126.2(d).
[415] Kjell-Arne Jonsson, The Dangerous Consequences of Taking Shortcuts When Shipping Lithium-Ion Batteries, March 9, 2018; http://info.nefab.com/lib-blog/lithium-ion-batteries-shipping-shortcuts.
[416] Allianz Risk Consulting, Lithium-Ion Batteries, Risk Bulletin, 2017; https://www.agcs.allianz.com/content/dam/onemarketing/agcs/agcs/pdfs-risk-advisory/risk-bulletins/ARC-Lithium-Ion-Batteries.pdf.

loading, and unloading in warehouses and during transportation.[417] The DEIR fails to discuss the risk of accidents during battery storage, handling, and transportation to the site and thus fails as an informational document under CEQA. A revised EIR is necessary to adequately analyze all impacts from battery storage and transportation.

XIV. CONCLUSION

For the reasons discussed above, the DEIR for the Project remains wholly inadequate under CEQA. It must be thoroughly revised to provide legally adequate analysis of, and mitigation for, all of the Project's potentially significant impacts. These revisions will necessarily require that the DEIR be recirculated for public review. Until the DEIR has been revised and recirculated, as described herein, the CPUC may not lawfully approve the Project.

Thank you for your attention to these comments. Please include them in the record of proceedings for the Project.

Sincerely,

Kelilah D. Federman
Associate Attorney

KDF:acp
Attachments

[417] FAA Office of Security and Hazardous Materials Safety, Lithium Batteries & Lithium Battery-Powered Devices, August 1, 2019; https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf.

EXHIBIT A

Comments

on the

Draft Environmental Impact Report for the

Estrella Substation and Paso Robles Area Reinforcement Project

San Luis Obispo County, California

February 22, 2021

Phyllis Fox, PhD, PE

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1. INTRODUCTION

The Estrella Substation and Paso Robles Area Reinforcement Project (Project) is proposed by Horizon West Transmission, LLC (HWT), formerly NextEra Energy Transmission West, LLC, and Pacific Gas and Electric Company (PG&E), together referred to as the Applicants. The purpose of the Project is to mitigate thermal overloads and voltage issues in the Los Padres 70 kV system (specifically in the San Miguel, Paso Robles, Templeton, Atascadero, Cayucos, and San Luis Obispo areas).

The Project involves: (1) the construction and operation of a new 230 kilovolt (kV)/70 kV substation to be operated by HWT; (2) a new 70 kV substation to be operated by PG&E; (3) a new approximately 7-mile-long 230 kV transmission line interconnection and replacement/reconductoring of approximately 3 miles of an existing 70 kV power line to be operated by PG&E; (4) reconductoring and pole replacement of a portion of the existing 70 kV power line to be operated by PG&E; (5) various distribution system components, including three new 21 kV distribution feeders; and (6) battery energy storage systems (BESSs).

I reviewed the Draft Environmental Impact Report (DEIR),[1] the Proponent's Environmental Assessment (PEA),[2] and supporting documents obtained from the Public Utilities Commission (PUC) via Public Record Act (PRA) requests. In my opinion, the DEIR has failed to identify and mitigate all significant environmental impacts, requiring recirculation of the DEIR. Further, because it failed to evaluate an important component of the Project—the BESS—arguing such analysis would be "speculative at this time," a future EIR is required to evaluate the impacts of this critical Project component. My review of the DEIR indicates the following errors, omissions, and unidentified significant impacts:

- The DEIR failed to impose all construction mitigation required by SLOCAPCD CEQA guidelines, including prohibitions on diesel idling and locating staging and queuing areas within 1,000 feet of sensitive receptors;
- The DEIR failed to require Tier 4 Final construction equipment, which was assumed in its estimate of construction emissions. Instead, the

[1] Horizon, Draft Environmental Impact Report, Estrella Substation and Paso Robles Area Reinforcement Project, Prepared for California Public Utilities Commission (CPUC), December 2020; https://www.cpuc.ca.gov/environment/info/horizonh2o/estrella/DEIR.html.

[2] SWCA, Proponent's Environmental Assessment Estrella Substation and Paso Robles Area Reinforcement Project, Prepared for NextEra Energy Transmission West, LLC and Pacific Gas and Electric Company (PEA), January 2017; https://www.cpuc.ca.gov/environment/info/horizonh2o/estrella/docs/PEA_January2017.pdf.

DEIR allows Tier 2 and 3 construction equipment, which have much higher emissions than included in the construction emission calculations;

- The DEIR failed to require BACT, required by SLOCAPCD CEQA guidance, for construction equipment, including SCR, lean NOx catalysts, and exhaust gas recirculation;
- The DEIR failed to require off-site mitigation for significant ROG+NOx construction emissions, required by SLOCAPCD CEQA guidance;
- The DEIR failed to require all SLOCAPCD fugitive dust mitigation measures;
- Construction emissions were underestimated for failing to address unique job site conditions;
- Emissions of fugitive dust were omitted from construction emissions, which are not estimated in the CalEEMod model used to estimate construction emissions, thus significantly underestimating construction PM10 and PM2.5 emissions;
- Construction health risks from diesel particulate matter (PM2.5) were not estimated, even though sensitive receptors are adjacent to construction sites;
- Cancer and acute health risks during construction over a very wide area including hundreds of homes are significant and unmitigated;
- Construction NOx emissions exceed the California 1-hour NOx ambient air quality standard of 339 $\mu g/m^3$, which is both a significant public health impact and a significant ambient air quality impact;
- Valley Fever impacts were not evaluated, are significant, and unmitigated;
- Risk of upset, including fire and explosion, of the battery energy storage facility (BESS) were not evaluated and are significant;
- Impacts from battery handling and transportation accidents and battery disposal were not evaluated and are potentially significant;
- Greenhouse gas emissions from battery charging are significant and unmitigated; and
- Significant aesthetic, biological, and public health impacts of the transmission line can be mitigated by undergrounding the entire length of the transmission line.

The DEIR failed to select the environmentally superior alternative, which should include undergrounding of the transmission line. In sum, the DEIR fails as an informational document under CEQA for omitting critical information, for failing to identify and evaluate all impacts, for failing to mitigate significant impacts, and for

failing to select the environmentally superior alternative. A revised DEIR should be prepared and recirculated for public review. Further, a future EIR should be prepared to evaluate impacts of the battery storage option when it has been selected.

My resume is included in Exhibit 1 to these Comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution control; greenhouse gas (GHG) emission inventory and control; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting; nuisance investigations (odor, noise); health risk assessments; EIRs; and litigation support. I have reviewed and commented on hundreds of CEQA documents and air permit applications, including for tank farms, refineries, solar and wind facilities, geothermal facilities, ethanol plants, oil and gas production, quarries, terminals, ports, battery energy storage systems, and many other industrial facilities. I have MS and PhD degrees in environmental engineering from the University of California at Berkeley. I am a licensed professional engineer (chemical) in California. My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (2001) 111 Cal. Rptr. 2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal. 4th 310 and has supported the record in many other CEQA cases.

2. CONSTRUCTION EMISSIONS ARE UNDERESTIMATED, SIGNIFICANT, AND UNMITIGATED

The Project's construction emissions are generated from two sources: operation of construction equipment and helicopters.[3] The DEIR concluded that some of these emissions were significant but failed to identify all construction emissions and failed to adequately mitigate them.

The DEIR concluded that maximum daily ROG+NOx construction emissions of 275.46 lb/day were significant, exceeding the daily significance threshold of 137 lb/day. Under SLOCAPCD guidance,[4] this requires "Standard Mitigation Measures."[5]

The DEIR also concluded that maximum quarterly construction emissions of ROG+NOx of 9.25 ton/quarter were significant, exceeding the Tier 1 significance

[3] DEIR, pdf 433.

[4] SLOCAPCD, CEQA Air Quality Handbook, April 2012, Table 2-1 and Attachment 1, Clarifications; https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/CEQA_Handbook_2012_v2%20%28Updated%20Map2019%29_LinkedwithMemo.pdf.

[5] Ibid., Attachment 1, Clarifications, pdf 67.

threshold of 2.5 ton/quarter.[6,7] Under SLOCAPCD guidance, this requires "Standard Mitigation Measures and Best Available Control Technology (BACT) for construction equipment. Off-site mitigation may be required if feasible mitigation measures are not implemented, or if no mitigation measures are feasible for the project."[8]

The DEIR also concluded that maximum quarterly construction emissions of ROG+NOx of 9.25 ton/quarter were significant, exceeding the Tier 2 significance threshold of 6.3 ton/quarter.[9] Under SLOCAPCD guidance this requires "Standard Mitigation Measures, BACT, implementation of a Construction Activity Management Plan (CAMP) and off-site mitigation…."[10]

Finally, the DEIR concluded that maximum fugitive dust PM10 emissions of 3.04 ton/quarter were significant, exceeding the Tier 1 significance threshold of 2.5 ton/quarter. Under SLOCAPCD guidance, this requires "Fugitive PM10 Mitigation Measures and may require the implementation of a CAMP."[11] With respect to PM10, the DEIR clarifies that the significant fugitive dust emissions are "mainly related to the helicopter fugitive dust emissions which will primarily occur at the Paso Robles airport."[12] As discussed in Comment 2.7, this is misleading because the DEIR failed to estimate fugitive dust emissions from on-site construction. These emissions are not calculated by the CalEEMod model used to estimate construction emissions and must be separately calculated. The DEIR did not estimate these emissions.

2.1. Construction Mitigation Is Inadequate and Inconsistent with SLOCAPCD Guidance

The DEIR asserts that these significant emissions will be mitigated using Applicant Proposed Measures (APMs) and mitigation measure (MM) AQ-1 as follows:[13]

- AIR-1: Minimize ROG, NOx, and PM Combustion
- AIR-2: Air Quality Best Available Control Technology for Construction Equipment

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[6] DEIR, pdf 433-434, Table 4.3-5.

[7] SLOCAPCD, CEQA Air Quality Handbook, Attachment 1, pdf 67.

[8] Ibid.

[9] The DEIR incorrectly reports the quarterly Tier 2 significance threshold for ROG + NOx as 26.3 ton/quarter. The correct quarterly Tier 2 significance threshold is 6.3 ton/quarter.

[10] Ibid., Attachment 1, pdf 67.

[11] Ibid, p. 2-2.

[12] DEIR, pdf 434.

[13] DEIR, Table ES-1, pdf 46, p. ES-22.

- AIR-3: Minimize Fugitive Dust
- MM AQ-1: Prepare a Construction Activity Management Plan (CAMP) for approval by SLOCAPCD

The construction mitigation plan is included in Appendix F to the DEIR. The DEIR concludes that construction air quality impacts remain significant and unavoidable (SU) after the implementation of these mitigation measures.[14] This conclusion is unsupported because the DEIR has failed to impose the mitigation required by the SLOCAPCD CEQA guidelines, as outlined above. It further has failed to impose all feasible mitigation, which includes measures not addressed in the SLOCAPCD CEQA Guidelines. These issues are discussed below.

2.2. SLOCAPCD Standard Mitigation Measures for Construction Equipment

The SLOCAPCD CEQA guidance requires the implementation of "standard mitigation measures for construction equipment" when construction emissions exceed significance thresholds,[15] as identified in Comment 2.7. Mitigation Measure (MM) APM AIR-1 in the Mitigation Monitoring and Reporting Plan[16] includes some, but not all, of the standard mitigation measures for construction equipment required to comply with the SLOCAPCD CEQA guidelines. The following required mitigation measures were omitted from DEIR Appendix F:

- Diesel idling within 1,000 feet of sensitive receptors is not permitted.
- Staging and queuing areas shall not be located within 1,000 feet of sensitive receptors.

These omissions are of great concern because a significant portion of Project construction will occur within 1,000 feet of sensitive receptors.[17] Diesel particulate matter (DPM) from idling construction equipment and construction equipment staging and queuing in these areas result in significant cancer and acute health impacts and violate the California 1-hour NOx ambient air quality standard. See Comment 2.8. These omitted SLOCAPCD measures must be included as Project mitigation.

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[14] Ibid.

[15] SLOCAPCD, CEQA Air Quality Handbook, pp. 2-6 to 2-7.

[16] DEIR, Appendix F, p. F-14 to F-16.

[17] See, for example, DEIR, Figures 2-8, sheets 3-8 (70 kV power line adjacent to residential neighborhoods); PEA, p. 3.3-19 ("Sensitive receptors have been identified within a 1-mile radius of the site, with the nearest residence located within 265 feet of the substation site.").

Further, the SLOCAPCD CEQA guidance requires the following additional diesel idling restrictions to protect public health and air quality that are omitted from the DEIR's Mitigation Monitoring and Reporting Plan in Appendix F:[18]

- Signs that specify the no-idling requirements must be posted and enforced at the construction site;
- Idling restrictions for on-road vehicles;
- Signs must be posted in the designated queuing areas and job sites to remind drivers of the 5-minute idling limits;
- Off-road diesel equipment shall comply with the 5-minute idling restriction;
- Signs shall be posted in the designated queuing areas and job sites to remind off-road equipment operators of the 5-minute idling limit.

None of these measures is required in the Mitigation Monitoring and Reporting Plan in Appendix F.

2.3. Best Available Control Technology (BACT) for Construction Equipment

The DEIR concluded that construction ROG+NOx emissions are significant.[19] SLOCAPCD CEQA guidance requires BACT for ROG and NOx when construction emissions exceed significance thresholds.[20] The SLOCAPCD CEQA Guidance for BACT specifies:[21]

- Further reducing emissions by expanding use of Tier 3 and Tier 4 off-road and 2010 on-road compliant engines;
- Repowering equipment with the cleanest engines available; and
- Installing California Verified Diesel Emission Control Strategies. These strategies are listed at: http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm

In contrast, the DEIR in APM AIR-2 only requires:[22]

- Reducing emissions by expanding use of Tier 3 off-road and 2010 on-road compliant engines; and
- Installing California Verified Diesel Emission Control Strategies.

[18] SLOCAPCD, CEQA Air Quality Handbook, p. 2-3.

[19] DEIR, Table 4.3-5.

[20] SLOCAPCD, CEQA Air Quality Handbook, pp. 2-6 to 2-7.

[21] SLOCAPCD CEQA Guidance, p. 2-7; see also pp. 4-14 to 4-15.

[22] DEIR, Appendix F, p. F-16, APM AIR-2.

However, the DEIR fails to disclose that the construction emission calculations assumed the use of 100% Tier 4 final engines in its CalEEMod emissions modeling,[23] which have much lower NOx and ROG emissions than Tier 2 or 3 engines. Thus, "expanding the use of Tier 3 engines"[24] is not mitigation and is not BACT. Rather, it allows higher construction emissions than the significant construction emissions estimated in the DEIR and does not mitigate significant impacts.

APM AIR-2 should be modified to state: "All diesel-powered construction equipment shall use Tier 4 Final construction equipment, to be confirmed on site by the on-site construction supervisor during each day of use." If a Tier 4 final engine is not available for select construction equipment, controls shall be installed on the highest tier equipment available to achieve Tier 4 Final standards. Effective controls include diesel particulate filters for PM2.5 (DPM)[25] and selective catalytic reduction (SCR) for NOx.

Tier 4 Final (2015) construction equipment has significantly lower NOx and ROG emissions than either Tier 3 or "transitional Tier 4" (2011) equipment. The Tier 4 Final NOx emission factor, for example, is 0.30 g/bhp-hr while the transitional Tier 4 NOx emission factors for engines of 56 to 130 kW are 1.7 to 2.5 g/bhp-hr and for engines of 130 to 560 kW, the Tier 4 Final NOx emission factor is 1.5 g/bhp-hr.[26] The text of the DEIR does not disclose the NOx emission factor that was used in the CalEEMod analysis for construction equipment. However, Appendix C, which contains the CalEEMod output, does disclose that Tier 4 Final engines were assumed for all construction equipment.[27] Thus, NOx emissions would be 5 to 8 times higher[28] than reported in Table 4.3-5, requiring substantially more mitigation for NOx than disclosed in the DEIR. Thus, APM AIR-2 does not reduce NOx and ROG emissions, but rather allows a significant increase in NOx and ROG emissions, compared to emissions reported in DEIR Table 4.3-5.

There are other recognized and feasible methods to reduce NOx and ROG from construction equipment that satisfy BACT, which should be required if Tier 4 Final

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[23] DEIR, Appendix C, pdf 3: "Construction Off-road Equipment Mitigation—Change to assume all equipment Tier 4 Final." See also Appendix C, pdf 420, 560, 561.

[24] DEIR, Table 2-12, p. 2-93, pdf 173.

[25] See Comment 2.8.1.2.

[26] DieselNet, United States: Nonroad Diesel Engines, "alternative NOx limits" during "phase-in period"; https://dieselnet.com/standards/us/nonroad.php.

[27] DEIR, Appendix C, pdf 3: "Construction Off-road Equipment Mitigation—Change to assume all equipment Tier 4 Final." See also Appendix C, pdf 420, 560, 561.

[28] Increase in NOx emission factor if Tier 4 rather than Tier 4 Final engines are used: for 56-130 kW engines: 2.5/0.3 = **8.3**. For engines 130-560 kW: 1.5/0.3 = **5.0**.

construction equipment is not available for all equipment required to construct the Project. These are discussed in Sections 2.3.1 to 2.3.4.

2.3.1. Selective Catalytic Reduction

NOx emissions from lower-tier construction equipment (i.e., Tiers 1, 2, 3) can be reduced by installing selective catalytic reduction (SCR). An SCR can reduce NOx emissions by 75% to 90%, while simultaneously reducing VOC emissions by up to 80% and PM emissions by 20% to 30%. SCR systems have been successfully demonstrated on off-road vehicles.[29] For example, the City of Houston Diesel Field Demonstration Project has demonstrated an 84% reduction in NOx emissions by using a diesel particulate filter (DPF)/SCR combination on a 1992 MY Cummins Gradall G3WD (5.9L 190 hp). As a result of this field demonstration program, the City of Houston retrofitted 33 rubber tire excavators and a dump truck with SCR systems.[30]

2.3.2. Lean NOx Catalysts

Lean NOx catalyst (LNC) technology can achieve a 10% to 40% reduction in NOx emissions. LNC technology does not require any core engine modifications and can be used to retrofit older engines. This retrofit technology can be combined with DPFs or diesel oxidation catalysts (DOCs) to provide both NOx and PM10 reductions. An LNC added to an exhaust system using a DPF can reduce NOx emissions by 10% to 25%.[31] Lean NOx catalyst technology has been demonstrated and commercialized for a variety of off-road retrofit applications, including heavy-duty earthmoving equipment.[32]

2.3.3. Exhaust Gas Recirculation

Exhaust gas recirculation (EGR) reduces NOx by reducing the temperature at which fuel burns in the combustion chamber. Engines employing EGR recycle a portion of engine exhaust back to the engine air intake. The oxygen-depleted exhaust gas is mixed into the fresh air that enters the combustion chamber, which dilutes the oxygen content of the air in the combustion chamber. This reduction in oxygen reduces the engine burn temperature, and hence reduces NOx emissions.[33] Engine retrofits

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[29] Manufacturers of Emission Controls Association (MECA), Retrofitting Emission Controls on Diesel-Powered Vehicles, pp. 2-3, April 2006; http://www.meca.org. See also MECA 3/6, p. 17.

[30] MECA 03/06, p. 12.

[31] MECA 03/06, p. 14.

[32] MECA 03/06, p. 19.

[33] Diesel Technology Forum, Retrofitting America's Diesel Engines: A Guide to Cleaner Air Through Cleaner Diesel; https://www.dieselforum.org/files/dmfile/Retrofitting-America-s-Diesel-Engines-11-2006.pdf.

with low-pressure EGR in conjunction with a diesel particulate filter can achieve NOx reductions of over 40% and PM reductions of more than 90% and have been successfully demonstrated on off-road equipment.[34]

2.3.4. Other NOx Mitigation Measures

Other mitigation measures that are feasible and have been required elsewhere to reduce NOx from construction equipment include:

- Use alternative fueled equipment (e.g., propane), where available;
- Limit engine idling to 2 minutes for all construction equipment;[35]
- Purchase offsets;
- Employ a construction site manager to verify that engines are properly maintained and to maintain a log.

Further, the SLOCAPCD CEQA Guidance allows the use of off-site mitigation if feasible on-site mitigation measures are not available for the Project.[36] Off-site mitigation is available and feasible. Voluntary Emission Reduction Agreements or VERAs have been used as CEQA mitigation. A VERA would require the Applicant to make a one-time payment for its significant unmitigated emissions in excess of significance thresholds to the SLOCAPCD, which would then use the payment to develop off-site mitigation.

VERAs have been identified as mitigation measures within other CEQA documents.[37] Types of projects that have been funded include electrification of stationary internal combustion engines and replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks. The San Joaquin Valley Air Pollution Control District (SJVAPCD) has repeatedly concluded that a VERA "is a feasible mitigation measure under CEQA, effectively achieving emission reductions necessary to reduce impacts to a less than significant level."[38]

This approach has been found legally sufficient by court rulings in the following cases: *California Building Industry Assn. v. San Joaquin Valley APCD*, Fresno County Case No. 06 CECG 02100 DS13*; National Association of Home Builders v. San Joaquin Valley*

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[34] MECA 04/06, p. 14.

[35] See, for example, SCAQMD, CEQA Air Quality Handbook, April, 1993, Tables 11-2 and 11-3. Further, many states limit idling time to 2 minutes.

[36] SLOCAPCD CEQA Guidance, Attach 1, Clarifications, p. 2, pdf 67 and pp. 17-18.

[37] SJVAPCD, Summary of Comments and Responses to Proposed Revisions to the GAMAQI-2012, May 31, 2012, p. 3; https://www.valleyair.org/transportation/GAMAQIDRAFT-2012/GAMAQIResponsetoComments5-10-12%20.pdf.

[38] SJVAPCD 2017, pp. 5, 9.

Unified Air Pollution Control District; Federal District Court, Eastern District of California, Case No. 1:07-CV-00820-LJO-DLB; and *Center for Biological Diversity et al. v. Kern County*, Fifth Appellate District, Case No. F061908.

2.4. Standard Mitigation Measures for PM10 Emissions from Construction Equipment

The SLOCAPCD CEQA Guidance requires "standard mitigation measures for construction equipment" and may require the implementation of a Construction Activity Management Plan (CAMP)[39] when fugitive dust PM10 emissions exceed 3.04 ton/quarter, as here. For projects with grading areas greater than 4 acres or that are within 1,000 feet of any sensitive receptor, both of which occur for the Project, the SLOCAPCD CEQA Guidance identifies 14 required fugitive dust mitigation measures.[40]

Project fugitive dust mitigation is addressed in APM AIR-3, Minimize Fugitive Dust.[41] The DEIR excludes several required SLOCAPCD standard mitigation measures for fugitive dust, the omission of which would increase fugitive dust. No justification is provided for the omissions, which include:

- SLOCAPCD measure b: "Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible").[42] As discussed in Comment 2.7, wind gusts in excess of 15 mph, up to 25 mph, occur frequently at the site. Figure 1. Thus, the omission of increased watering frequency during high wind events will result in substantially higher PM10 emissions than disclosed in the DEIR.
- SLOCAPCD measure b: The SLOCAPCD expanded this measure in a November 2017 Clarification Memo.[43] It now additionally requires the following, omitted from the DEIR:

> Use of water trucks or sprinkler systems, in sufficient quantities to prevent airborne dust from leaving the site and from exceeding the APCD's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible. Please note that during drought conditions, water use may be a concern and the contractor or builder shall consider the use of an APCD-approved dust suppressant where feasible to reduce the amount of water used for dust control.

[39] Ibid., p. 2-6, Section 2.3.

[40] Ibid., p. 2-9, pdf 21, "Fugitive Dust Mitigation Measures: Expanded List."

[41] DEIR, Appendix F, p. F-16.

[42] SLOCAPCD CEQA Guidance, p. 2-8, 2-9, 4-12, and pdf 68.

[43] SLOCAPCD CEQA Guidance, pdf 66: Memo from SLOCAPCD to All Interested Parties, Re: Clarification Memorandum for the SLOCAPCD's 2012 CEQA Air Quality Handbook.

- SLOCAPCD measure d: "Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible following completion of any soil disturbing activities";
- SLOCAPCD measure e: "Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading should be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established";
- SLOCAPCD measure g: "All roadways, driveways, sidewalks, etc. to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used";
- SLOCAPCD measure j: "Install wheel washers where vehicles enter and exit unpaved roads onto streets, or wash off trucks and equipment leaving the site";
- SLOCAPCD measure j: The SLOCAPCD expanded this measure in the November 2017 Clarification Memo.[44] It now additionally requires the following, omitted from the DEIR:

> "Track-Out" is defined as sand or soil that adheres to and/or agglomerates on the exterior surfaces of motor vehicles and/or equipment (including tires) that may then fall onto any highway or street as described in California Vehicle Code Section 23113 and California Water Code 13304. To prevent Track Out, designate access points and require all employees, subcontractors, and others to use them. Install and operate a "track-out prevention device" where vehicles enter and exit unpaved roads onto paved streets. The track-out prevention device can be any device or combination of devices that are effective at preventing track out, located at the point of intersection of an unpaved area and a paved road. Rumble strips or steel plate devices require periodic cleaning to be effective. If paved roadways accumulate tracked out soils, the track-out prevention device may need to be modified.

- SLOCAPCD measure k: "Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads…." The DEIR modified this measure to limit street sweeping to "soil material extending over 50 feet," thus limiting the amount of street sweeping required.

All of these omissions and modifications of required SLOCAPCD fugitive dust mitigation measures will result in higher fugitive PM10 emissions than allowed by the SLOCAPCD guidance or disclosed in the DEIR.

[44] SLOCAPCD CEQA Guidance, pdf 68.

In sum, construction emissions are significantly underestimated, and the proposed mitigation measures do not mitigate the significant construction impacts to the maximum extent feasible.

2.5. Impact of Job Site Conditions on Emissions

The DEIR used the CalEEMod model to estimate construction emissions. This model uses a lot of default emission assumptions that do not apply to the Project site. It is well known that there are large discrepancies between measured emissions data and theoretical emission models such as CalEEMod. The emissions from construction equipment depend upon the load under which each piece of equipment operates.[45] The equipment load, in turn, depends on soil conditions. The DEIR used default load factors as provided in CalEEMod. However, default load factors are not appropriate for this Project due to the nature of the terrain.

Job site conditions affect the emissions from construction equipment. A recent study reported that:[46]

> The fuel consumption and emissions of equipment inevitably increase in tough working conditions involving hills and slopes on jobsites, or medium to hard underground or ground soil conditions. The amounts of fuel consumptions or emissions can increase up to 2-4 times for heavy duty works, as compared with light duty applications for the same equipment, according to Caterpillar Performance Handbook.

The Project site involves difficult working conditions, including steep hills and slopes and areas subject to subsidence, erosion, and liquefaction.[47] The CalEEMod inputs, on the other hand, are based on default conditions—namely, flat land without the potential for subsidence, erosion, and liquefaction. Thus, actual emissions of GHGs and criteria pollutants from Project construction are higher than disclosed in the DEIR.

2.6. Construction Equipment Emission Factors Underestimated

Emission models, such as the CalEEMod model, use fleet average emission factors that are mostly obtained from steady-state engine dynamometer results, adjusted for various factors. They do not represent real-world duty cycles, a serious issue for this site due to its hilly nature. Dynamometer tests do not capture the episodic

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[45] See, for example, K. Barati and X. Shen, Operational Level Emissions Modelling of On-Road Construction Equipment through Field Data Analysis, *Automation in Construction*, v. 72, pp. 338-346, 2016 ("Emission rates of CO2, CO, HC and NOx were also found to be directly related to changes in engine load. For example, for one specific type of vehicle, CO_2 was around 2 g/s at 20% engine load, which increased almost linearly to 8 g/s at an engine load of 90%."). Exhibit 4.

[46] H. Fan, A Critical Review and Analysis of Construction Equipment Emission Factors, *Procedia Engineering*, v. 196, pp. 351–358, 2017; https://www.sciencedirect.com/science/article/pii/S1877705817330801. Exhibit 19.

[47] DEIR, Section 4.7. See for example, p. 4.7-11 and Figures 4.7-1/3.

nature of fuel use and emissions during real-world duty cycles, such as idling, use of an attachment, movement of a load, and so on. These emission factors should be confirmed for the specific equipment and work conditions in the field by connecting a particulate emissions monitoring system (PEMS) to the vehicle's engine and to its exhaust system to monitor the emissions while the vehicle is in use.[48]

2.7. Fugitive Dust PM10 Emissions Are Omitted

The DEIR concluded that fugitive dust PM10 emissions of 3.04 ton/quarter exceed the significance threshold of 2.5 ton/quarter.[49] The DEIR asserts that these fugitive dust PM10 emissions are "mainly related to the helicopter fugitive dust emissions which will primarily occur at the Paso Robles airport."[50] Table 4.3-5 shows 2.98 ton/quarter for helicopter operations and 0.05 ton/quarter for on-site construction. However, none of the mitigation measures in the Mitigation Monitoring and Reporting Plan in Appendix F addresses fugitive dust emissions at the airport. Thus, these emissions are significant and unmitigated.

Further, the PM10 fugitive dust emissions from Project construction are significantly underestimated because the CalEEMod model used to estimate construction emissions does not include all sources of PM10 and PM2.5 construction emissions, let alone from the unique aspects of this Project. It omits the major source of fugitive PM10 emissions at construction sites—windblown dust from graded areas and storage piles and fugitive dust from off-road travel:[51]

> Fugitive dust associated with grading, demolition, truck loading, and on-road vehicles traveling along paved and unpaved roads. (Fugitive dust from wind blown sources such as storage piles and inactive disturbed areas, as well as fugitive dust from off-road vehicle travel, are not quantified in CalEEMod, which is consistent with approaches taken in other comprehensive models.)

These emissions must be separately calculated using methods in AP-42[52] and added to the CalEEMod PM10 and PM2.5 emissions. Fugitive dust emissions arise from storage piles, grading, truck loading, and inactive disturbed areas. Based on calculations I have made in other cases, these are the major sources of PM10 and PM2.5

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[48] P. Lewis and others, Requirements and Incentives for Reducing Construction Vehicle Emissions and Comparison of Nonroad Diesel Engine Emissions Data Sources, *Journal of Construction Engineering and Management*, v. 135, no. 5, pp. 341-351, 2009. Exhibit 5.

[49] DEIR, Table 4.3-5, pdf 433/444, pp. 4.3-15/16.

[50] DEIR, pdf 434, p. 4.3-16.

[51] CAPCOA 2016, pdf 8. This same language appears in CAPCOA 2017, pdf 7.

[52] U.S. EPA, Compilation of Air Pollutant Emission Factors, Report AP-42; https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emission-factors#Proposed.

emissions from construction projects. Fugitive dust emissions taken alone frequently exceed the PM10 and PM2.5 significance thresholds. Thus, the DEIR, which relied on the CalEEMod emission calculations, fails as an informational document under CEQA.

Windblown dust from Project disturbed soils is a particular concern at this site because high winds occur regularly during spring.[53] The DEIR fails as an informational document under CEQA for failing to include a wind rose for the Project area, which is known for high winds called the Santa Lucia winds.[54] Wind speed data for the Paso Robles Airport for the period September 2012 to December 2020 report an average wind speed of 9 mph.[55] Gusts up to 25 mph occur throughout the year. Figure 1.

Figure 1: Average Wind Speeds for Paso Robles Airport[56]

In comparison, the DEIR's construction emissions assumed an average wind speed of 3.2 m/s (7.2 mph).[57] The higher winds that occur at the Project site can raise significant amounts of dust, even when conventional dust control methods are used. If these winds occurred during grading, cut and fill, or soil movement, from bare graded soil surfaces (even if periodically wetted), significant amounts of PM10 and PM2.5 as well as silica dust would be released. As dust control is not required during nighttime hours when no active construction activity occurs, PM10 and PM2.5 emissions could be even higher than during active construction work. These emissions could result in public health impacts from Valley Fever spores (Comment 3), silica, and/or violations of PM10 and PM2.5 California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). The DEIR did not evaluate these potential impacts, thus failing as an informational document under CEQA.

[53] DEIR, pdf 496, p. 4.4-50; pdf 891, p. 4.2-9.

[54] DEIR, p. 4.20-9, pdf 891.

[55] Windfinder, Paso Robles Airport; https://www.windfinder.com/windstatistics/paso_robles_municipal_airport.

[56] Ibid.

[57] DEIR, Appendix C, pdf 27, 160, 288, 417, 558.

Wind erosion emissions are typically calculated using methods in AP-42,[58] which require detailed information on site topography, wind profiles, and dispersion modeling. This information is not cited or included in the DEIR. Generally, wind erosion ambient air quality impacts are estimated using the AERMOD model. The DEIR does not include any calculations of wind erosion emissions, any of the information required to calculate them, or any estimation of ambient PM10 impacts from wind erosion. Rather, the DEIR tacitly assumes that compliance with conventional construction mitigation measures and regulations constitutes adequate wind erosion control, without any analysis at all or without acknowledging the added risk of high-velocity winds that occur in the area.

Wind erosion emissions depend on the disturbed area. The CalEEMod runs in Appendix C assumed a disturbed area of 119.4 acres.[59] The basis for this disturbed area is not disclosed. The DEIR text reported disturbed areas ranging from 122.7 acres[60] to 163.5 acres (Alternative PLR-1A)[61] to 181.24 acres (Alternative PLR-1C).[62]

The DEIR does not include a construction schedule, required to determine the maximum amount of acreage disturbed during the maximum quarter, thus failing as an informational document under CEQA. I assume the maximum graded area based on the CalEEMod output in Appendix C of 27 acres[63] in my calculations of wind erosion emissions below.

Particulate matter emissions can be estimated from the EPA emission factor for construction activity of 1.2 tons per acre per month of activity.[64] Studies indicate that on average, PM10 accounts for 34% to 52% of the total suspended particulates (TSP) when watering is used for dust control.[65] Thus, earthmoving activities could generate up to

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[58] U.S. EPA, AP-42, Section 13.2.5 Industrial Wind Erosion; https://www3.epa.gov/ttnchie1/ap42/ch13/final/c13s0205.pdf.

[59] DEIR, Appendix C, pdf 27, 160, 288, 417, 558.

[60] DEIR, Table 2-3, pdf 153-154.

[61] DEIR, Table 3-4, pdf 238.

[62] DEIR, Table 3-8, pdf 268.

[63] DEIR, Appendix C, pdf 33, 166, 294, 424.

[64] AP-42, Section 13.2.3 Heavy Construction Operations, pdf 1; https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s02-3.pdf.

[65] Ingrid P. S. Araujo, Dayana B. Costa, and Rita J. B. de Moraes, Identification and Characterization of Particulate Matter Concentrations at Construction Job Sites, *Sustainability*, v. 6, pp. 7666-7688, 2014, Table 5, https://ideas.repec.org/a/gam/jsusta/v6y2014i11p7666-7688d41878.html.

31.2 ton/qtr of PM10,[66] exceeding the significance threshold of 2.5 ton/quarter. These significant PM10 emissions must be mitigated.

There are numerous feasible PM10 control methods that were not required in the Mitigation Monitoring and Reporting Plan that have been required in other CEQA documents and recommended by various air pollution control districts, including the Bay Area Air Quality Management District (BAAQMD)[67] and the South Coast Air Quality Management District (SCAQMD).[68] The following should be required for the Project:

1) Apply water every 4 hours to the area within 100 feet of a structure being demolished, to reduce vehicle trackout.

2) Use a gravel apron, 25 feet long by road width, to reduce mud/dirt trackout from unpaved truck exit routes.

3) Apply dust suppressants (e.g., polymer emulsion) to disturbed areas upon completion of demolition.

4) Apply water to disturbed soils after demolition is completed or at the end of each day of cleanup.

5) Prohibit demolition activities when wind speeds exceed 25 mph.

6) Apply water every 3 hours to disturbed areas within a construction site.

7) Require minimum soil moisture of 12% for earthmoving by use of a moveable sprinkler system or a water truck. Moisture content can be verified by lab sample or moisture probe.

8) Limit on-site vehicle speeds (on unpaved roads) to 15 mph by radar enforcement.

9) Replace ground cover in disturbed areas as quickly as possible.

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[66] Earthmoving TSP emissions = (1.2 ton TSP/acre-mo)(27 acres) = **32.4 ton TSP/mo.** Assuming 32% of the TSP is PM10, PM10 emissions = (32.4 ton TSP/mo)(0.32) = 10.4 ton PM10/mo = **31.2 ton/qtr.**

[67] BAAQMD, CEQA Air Quality Guidelines, May 2017, Tables 8-2 and 8-2; https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en.

[68] SCAQMD, Fugitive Dust Mitigation Measure Tables; http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust.

10) All trucks hauling dirt, sand, soil, or other loose materials are to be tarped with a fabric cover and maintain a freeboard height of 12 inches.[69]

2.8. Construction Health Risks Were Not Evaluated and Are Significant

The DEIR is silent on construction health risks. CEQA requires lead agencies to disclose the health risks posed by toxic air contaminants released during construction and operation. The Office of Environmental Health Hazard Assessment's (OEHHA's) risk assessment guidelines recommend a formal health risk assessment for short-term construction exposures lasting longer than 2 months, and exposures from projects lasting more than 6 months should be evaluated for the duration of the project.[70] The construction of this Project will last for 7 to 34 months, depending upon the alternative.[71] The OEHHA risk assessment guidelines, which are used throughout California for assessing health risks under CEQA, state:

[69] SCAQMD, Fugitive Dust Mitigation Measure Table XI-A, http://www.aqmd.gov/docs/default-source/ceqa/handbook/mitigation-measures-and-control-efficiencies/fugitive-dust/fugitive-dust-table-xi-a.doc?sfvrsn=2.

[70] Office of Environmental Health Hazard Assessment (OEHHA), Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments, February 2015 (OEHHA 2015), Section 8.2.10: Cancer Risk Evaluation of Short Term Projects, pp. 8-17/18; https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0.

[71] DEIR, Table 3-21, pdf 335.

Due to the uncertainty in assessing cancer risk from very short-term exposures, we do not recommend assessing cancer risk for projects lasting less than two months at the MEIR. We recommend that exposure from projects longer than 2 months but less than 6 months be assumed to last 6 months (e.g., a 2-month project would be evaluated as if it lasted 6 months). Exposure from projects lasting more than 6 months should be evaluated for the duration of the project. In all cases, for assessing risk to residential receptors, the exposure should be assumed to start in the third trimester to allow for the use of the ASFs (OEHHA, 2009). Thus, for example, if the District is evaluating a proposed 5-year mitigation project at a hazardous waste site, the cancer risks for the residents would be calculated based on exposures starting in the third trimester through the first five years of life.

For the MEIW, we recommend using the same minimum exposure requirements used for the residential receptor (i.e., no evaluation for projects less than 2 months; projects longer than 2 months but less than 6 months are assumed to last 6 months; projects longer than 6 months would be evaluated for the duration of the project). Although the off-site worker scenario assumes that the workers are 16 years of age or older with an Age-Sensitivity Factor of 1, another risk management consideration for short-term project cancer assessment is whether there are women of child bearing age at the worksite and whether the MEIW receptor has a daycare center. In this case, the Districts may wish to treat the off-site MEIW in the same way as the residential scenario to account for the higher susceptibility during the third trimester of pregnancy, and for higher susceptibility of infants and children.

Finally, the risk manager may want to consider a lower cancer risk threshold for risk management for very short-term projects. Typical District guidelines for evaluating risk management of Hot Spots facilities range around a cancer risk of 1 per 100,000 exposed persons as a trigger for risk management. Permitting thresholds also vary for each District. There is valid scientific concern that the rate of exposure may influence the risk – in other words, a higher exposure to a carcinogen over a short period of time may be a greater risk than the same total exposure spread over a much longer time period. In addition, it is inappropriate from a public health perspective to allow a lifetime acceptable risk to accrue in a short period of time (e.g., a very high exposure to a carcinogen over a short period of time resulting in a 1×10^{-5} cancer risk). Thus, consideration should be given for very short term projects to using a lower cancer risk trigger for permitting decisions.

Health risk assessments are routinely performed for construction projects when there are nearby sensitive receptors, as here. Numerous sensitive receptors are close to Project components. Thus, construction could result in significant public health and other impacts. Nearby sensitive receptors include residences near the substation site and along the reconductoring and new 70 kV powerline segments.

The PEA, for example, contains a list of 575 parcels within 300 feet of the Estrella Substation and the transmission line route.[72] Elsewhere, the PEA contains a list of sensitive receptors in the vicinity of the Project, summarized here as Table 1. See also Figure 2. Of greatest concern is the entry of "numerous residences" closer than 50 feet. The occupants of these residences are at great risk of adverse health impacts from construction emissions.

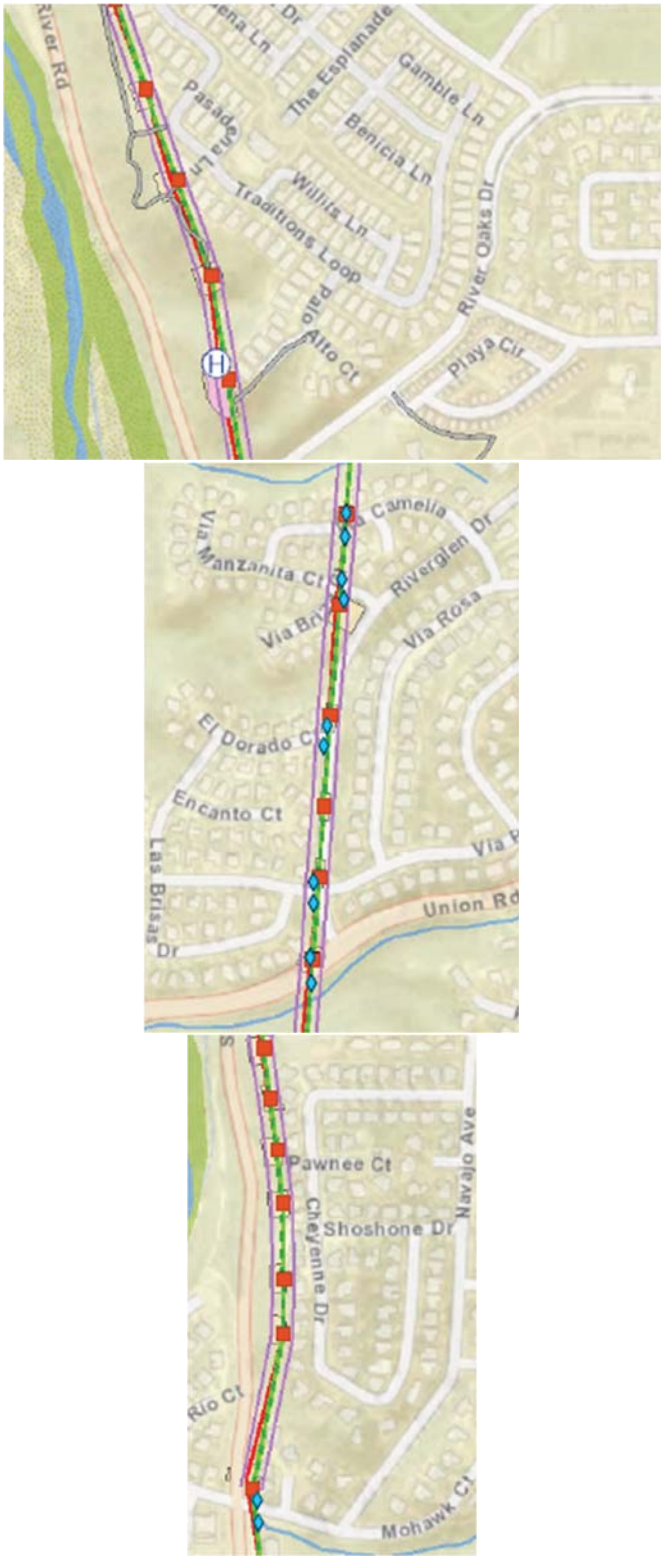
[72] PEA, Appendix A, Affected Properties, p. A-1 to A-19, May 2017.

Table 1: Sensitive Receptors in Vicinity of Project[73]

Type	Distance from Project Area	Direction from Project Area
Residence	Within 265 feet	Southwest of Estrella Substation
Residence	Within 1,320 feet	Southeast of Estrella Substation
2 Residences	Within 2,300 feet	Northwest of Estrella Substation
Residence	1,100 feet	East of Estrella Substation
2 Residences	20 feet	North of the new 70 kV power line segment
2 Residences	100 feet	North of the new 70 kV power line segment
10+ Residences	Within 200 feet	Along the new 70 kV power line segment
10+ Residences	Within 500 feet	Along the new 70 kV power line segment
15+ Residences	Within 1,000 feet	Along the new 70 kV power line segment
10+ Residences	Within 1,500 feet	Along the new 70 kV power line segment
1 Residence	1,600 feet	Along the new 70 kV power line segment
Jehovah's Witnesses Golden Hill	165 feet	South of new 70 kV power line segment in Paso Robles
Paso Robles Swim and Tennis Club	50 feet	North of the new 70 kV power line segment
Barney Schwartz Park	80 feet	Southwest of the new 70 kV power line segment
River Oaks Golf Course	1,320 feet	East of the reconductoring segment
Tots Landing Daycare	265 feet	East of the reconductoring segment
Grace Baptist Church	790 feet	East of the reconductoring segment
Numerous Residences	<50 feet	Along the reconductoring segment (too numerous to pinpoint)

[73] PEA, Table 3.12-6.

Figure 2: Proximity of Homes to Reconductoring[74]



[74] DEIR, Figure 2-7, pdf 113.

Residences, public open space, and recreation areas (e.g., Barney Schwartz Park, Cava Robles RV Resort) are present along the proposed 70 kV power line route. FTM Site 7 is located close to an existing church.[75] FTM Site 4 is near the Paso Robles High School. FTM Site 2 is adjacent to the Woodland Shopping Center II. FTM Site 3 is surrounded by residences.[76]

Diesel particulate matter (DPM) will be emitted from on-road and off-road equipment during Project construction and decommissioning. DPM is a potent human carcinogen.[77] It is also chronically[78] and acutely[79] toxic. California's Office of Environmental Health Hazard Assessment (OEHHA) concluded that "[e]xposure to diesel exhaust can have immediate health effects," which include "inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks."[80] This is particularly critical given the current Covid epidemic.

Thus, a health risk assessment was prepared for Project construction for two cases: (1) DPM emissions as assumed in the DEIR based on the use of all Tier 4 Final construction equipment as assumed in the CalEEMod analysis and (2) DPM emissions assuming the use of Tier 2 construction equipment.

2.8.1. Construction Cancer Risks Are Significant

The following sections present the results of the health risk assessment prepared by Ray Kapahi[81] at Environmental Permitting Specialists, which is included in Exhibit 20 to these comments. This HRA indicates that cancer health risks of Project construction are highly significant, requiring additional construction mitigation. These significant impacts can be mitigated by requiring the use of all Tier 4 final construction

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[75] DEIR, p. 4.3-10, pdf 428. See also Figures 3-15, 3-16, 3-24.

[76] DEIR, Figure 3-16.

[77] OEHHA and the American Lung Association of California, Health Effects of Diesel Exhaust; https://oehha.ca.gov/media/downloads/calenviroscreen/indicators/diesel4-02.pdf. See also: OEHHA, Diesel Exhaust Particulate; https://oehha.ca.gov/chemicals/diesel-exhaust-particulate#:~:text=Cancer%20Potency%20Information&text=Listed%20as%20Particulate%20Emissions%20from,(ug%2Fm3)%2D1.

[78] OEHHA Acute, 8-hour and Chronic Reference Exposure Level (REL) Summary, June 28, 2016; https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary.

[79] Government of Canada, Human Health Risk Assessment for Diesel Exhaust, March 4, 2016; http://publications.gc.ca/collections/collection_2016/sc-hc/H129-60-2016-eng.pdf.

[80] OEHHA and the American Lung Association of California, Health Effects of Diesel Exhaust; https://oehha.ca.gov/media/downloads/calenviroscreen/indicators/diesel4-02.pdf.

[81] Exhibit 21.

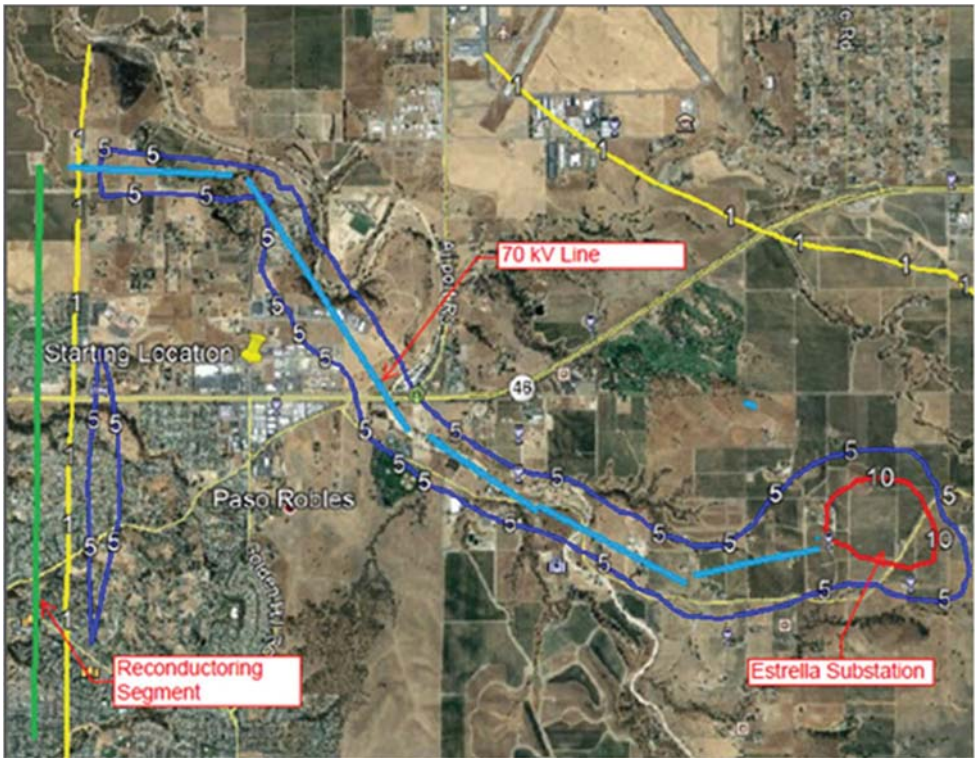
equipment, as assumed in the DEIR's construction emission calculations, but not required in the DEIR's mitigation measures.

2.8.1.1. Scenario 1 Cancer Risks

The cancer risk results for Scenario 1, which used the DEIR's DPM construction emissions based on 100% Tier 4 Final engines, are summarized in Figure 3.[82] The cancer significance threshold is 10 cancer cases in one million exposed, or 10 in one million. The dark blue isopleth line corresponds to a cancer risk of 5 in one million, which is less than the cancer significance threshold.

Cancer risks only equal or exceed the significance threshold (red isopleth in lower right-hand corner of Figure 3 in the vicinity of the Estrella Substation). The PEA reports several residences within this isopleth. Table 1. Thus, if all Tier 4 Final engines are used for construction, cancer risks would only be significant in the vicinity of the Estrella Substation, requiring additional mitigation during construction of the Substation, such as mandating the use of biodiesel fuel in all construction equipment. However, the DEIR does not require all Tier 4 final engines or the use of biodiesel fuel.

Figure 3: Cancer Risk Isopleth Map, Scenario 1 (Tier 4 Final Engines)[83]



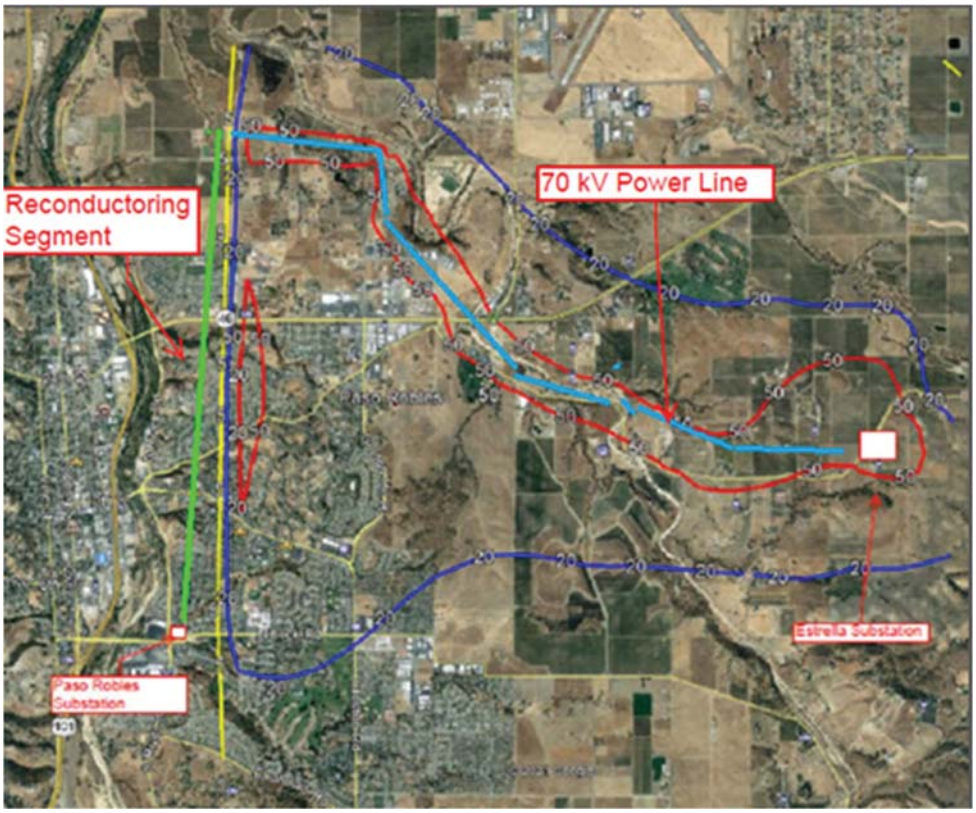
[82] Exhibit --, Figure --.

[83] Exhibit 20, Figure 4-1.

2.8.1.2. Scenario 2 Cancer Risks

The cancer risk results for Scenario 2, which is based on the use of all Tier 2 construction equipment, as allowed by the DEIR (which only encourages an increase in Tier 3 engines, but does not require them), is summarized in Figure 4. The red isopleth line corresponds to a cancer risk of 50 in one million. The dark blue isopleth line corresponds to a cancer risk of 10 in one million. All sensitive receptors within these isopleths will experience significant cancer risks during construction.

Figure 4: Cancer Risk Isopleth Map, Scenario 2 (Tier 2 Engines)[84]



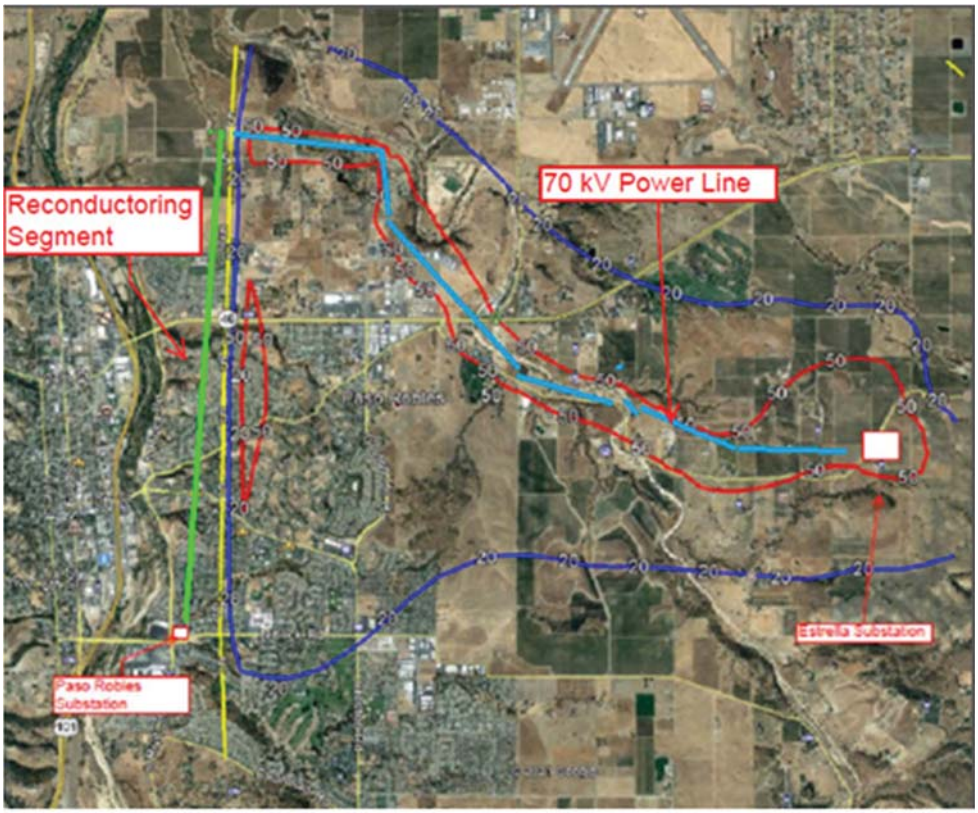
The PEA identifies numerous sensitive receptors in the areas encompassed by these isopleths. Notably, it identifies residences "too numerous to pinpoint" within 50 feet of the reconductoring segment as well as a church, daycare center, golf course, park, and swim and tennis club, among others. Table 1.

Figure 5 shows a close-up view of the area east of the reconductoring segment. This figure shows hundreds of homes within the 20 to 50 cancer cases per million isopleths. These are highly significant cancer risks, two to five times higher than the significance threshold of 10 in one million, requiring mitigation. These risks can be

[84] Exhibit 20, Figure 4-2.

mitigated by requiring the use of all Tier 4 construction equipment and diesel particulate traps (soot filters)[85].

Figure 5: Cancer Risk Isopleths for Scenario 2, Showing Homes East of the Reconductoring Segment[86]



2.8.2. Construction Acute Health Impacts Are Significant

Acute health impacts occur over a 1-hour exposure time. OEHHA has not established an acute reference exposure level (REL) for DPM but other agencies have. The absence of an OEHHA acute risk exposure level does not excuse the Applicant from evaluating acute health risks. In the absence of an OEHHA significance threshold, it is standard practice to conduct a literature search to determine if other authorities have established a threshold. Since OEHHA last evaluated health impacts of DPM in

[85] See, e.g., CARB, A Guide to California's Clean Air Regulations for Heavy-Duty Diesel Vehicles, February 2020, pdf 12; https://ww3.arb.ca.gov/msprog/truckstop/pdfs/truck_bus_booklet.pdf and CARB, Heavy-Duty Diesel Emission Control Strategy Installation and Maintenance, June 28, 2019; https://ww2.arb.ca.gov/resources/fact-sheets/heavy-duty-diesel-emission-control-strategy-installation-and-maintenance.

[86] Exhibit 20, Figure 4-3.

1998,[87] substantial additional research has been conducted on acute health impacts of DPM.[88] Based on this more current research, Canada recently established an acute REL for DPM of 10 μg/m^3 to protect against adverse effects on the respiratory system.[89] There is no regulation or guidance requiring that only OEHHA RELs be used in California health risk assessments.

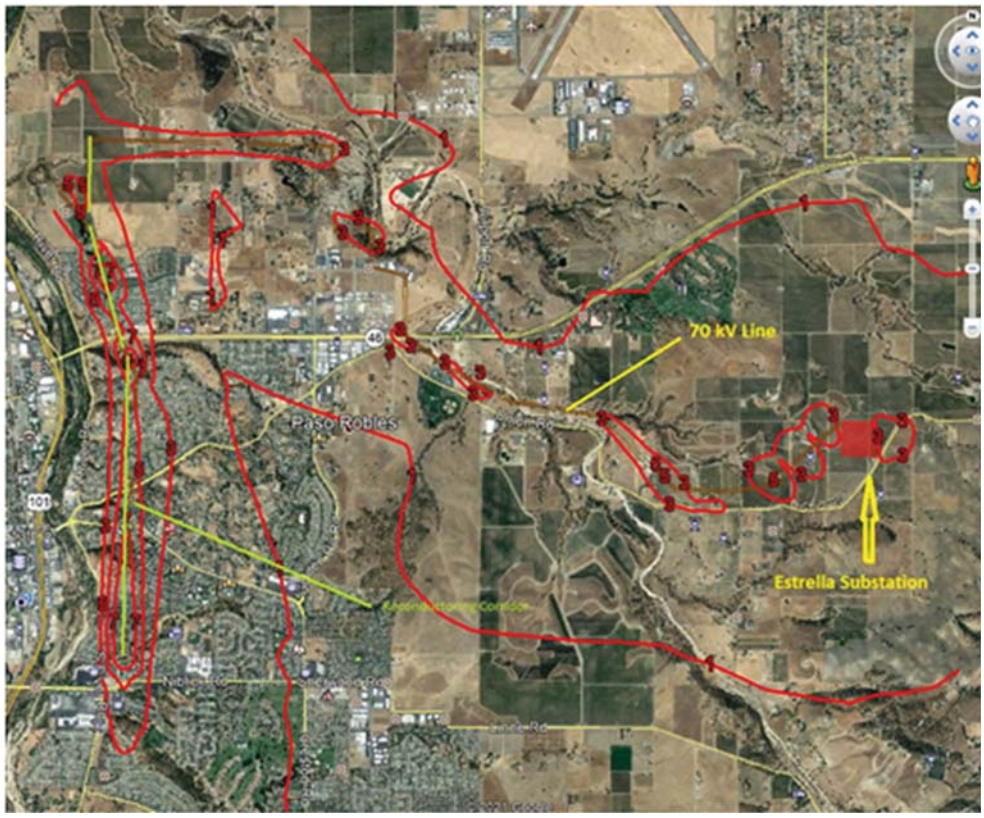
Figures 6 and 7 show isopleths for acute health impacts of DPM emissions during construction for Scenario 1, which assumed all Tier 4 final construction equipment and Scenario 2, which assumed all Tier 2 construction equipment. An acute hazard index greater than 1 is significant. Thus, the isopleths that show acute hazard indices greater than 1, such as those around the Estrella Substation, the 70 kV line, and the reconductoring segment are highly significant in both scenarios. Sensitive receptors in these locations will experience significant respiratory impacts.

[87] Findings of the Scientific Review Panel on the Report on Diesel Exhaust, 1998; https://www.arb.ca.gov/toxics/dieseltac/de-fnds.pdf.

[88] See, e.g., A. A. Mehus and others, Comparison of Acute Health Effects from Exposures to Diesel and Biodiesel Fuel Emissions and references cited therein, *Journal of Occupational and Environmental Medicine*, v. 57, no. 7, pp. 705-712, July 2015; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4479787/.

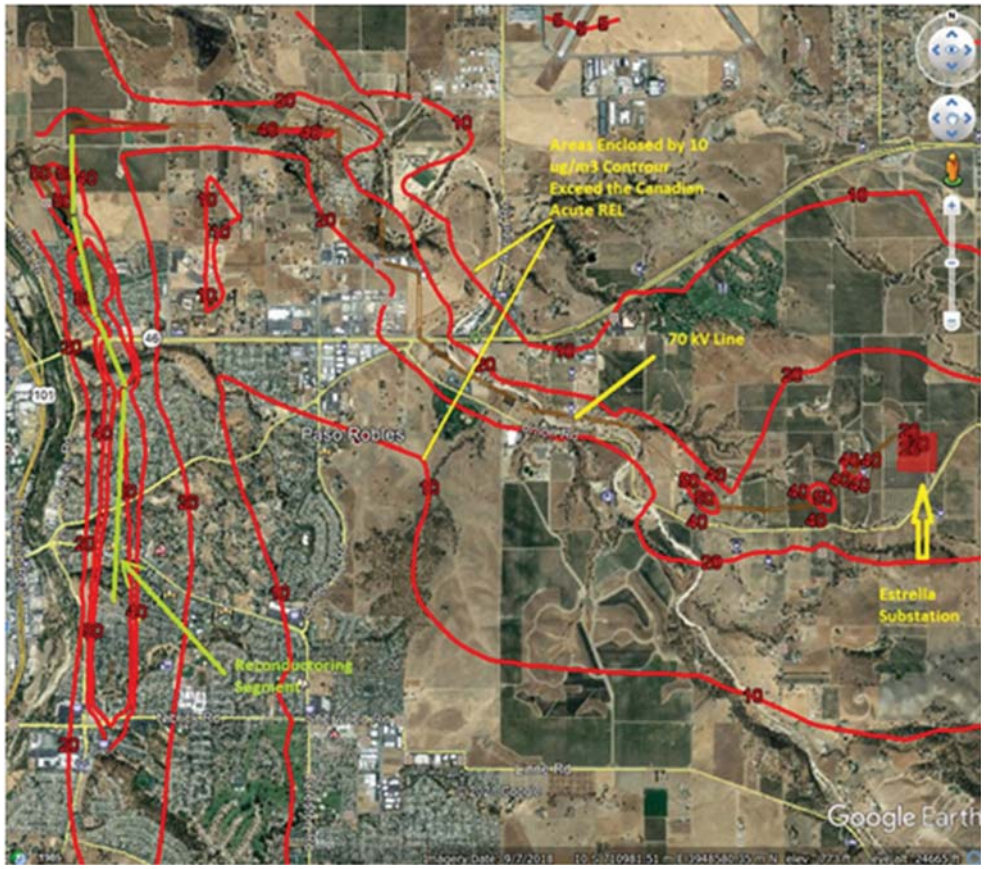
[89] Government of Canada, Human Health Risk Assessment for Diesel Exhaust, March 4, 2016; http://publications.gc.ca/collections/collection_2016/sc-hc/H129-60-2016-eng.pdf.

Figure 6: Acute Health Isopleths for Scenario 1[90]



[90] Exhibit 20, Figure 4-4.

Figure 7: Acute Health Isopleths for Scenario 2[91]



2.9. Construction Ambient NOx Impacts Are Significant

California has established a short-term ambient air quality standard for NOx of 339 µg/m^3. Construction NOx emissions were modeled for two scenarios: (1) NOx emissions estimated in the DEIR, based on 100% Tier 4 final construction equipment and (2) NOx emissions five times higher than estimated in the DEIR, assuming 100% Tier 3 equipment.

The CalEEMod analysis assumed the use of 100% Tier 4 Final engines. As noted in Comment 2.3, the DEIR's mitigation in APM AIR-2 only requires "expanding use of Tier 3 off-road and 2010 on-road compliant engines."[92] Based on my calculations, if all Tier 3 engines were used, NOx emissions would be 5 to 8[93] times higher than estimated

[91] Exhibit 20, Figure 4-5.

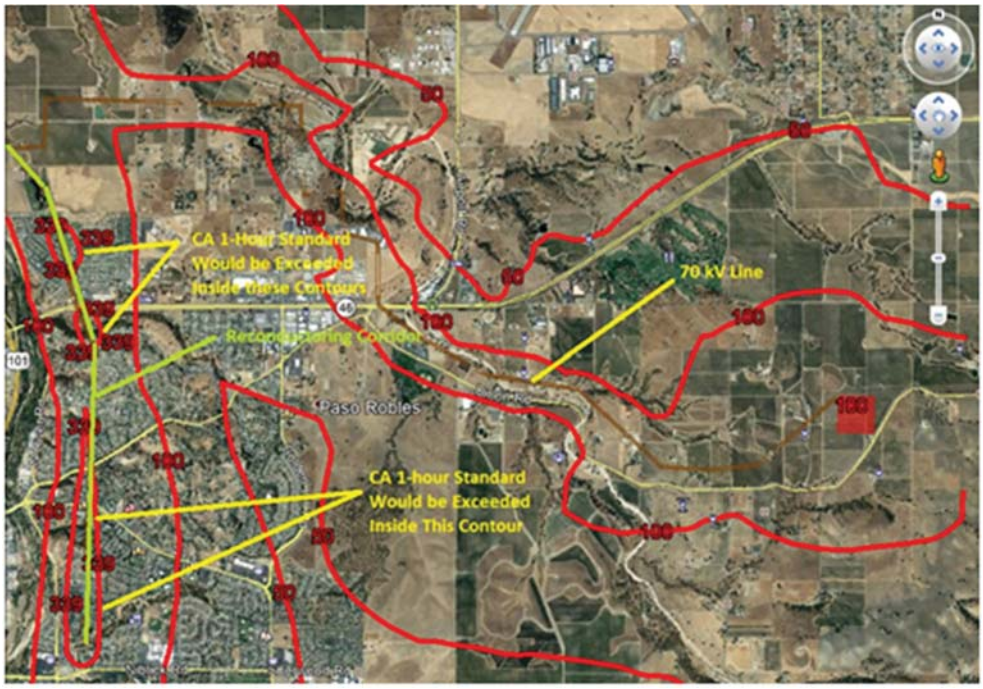
[92] DEIR, Appendix F, p. F-16, APM AIR-2.

[93] Increase in NOx emissions if all Tier 3 engines were used for equipment of 56 to 130 kW: 2.5/0.3 =8.3. Increase in NOx if all Tier 3 engines were used for equipment of 130-560 kW = 1.5/0.3 = 5.0.

in the DEIR, depending upon the kW rating of the engines. We conservatively selected the lower end of this range to model ambient construction NOx concentrations.

The results of modeling the DEIR's construction NOx emissions are shown in Figure 8. This figure indicates that the California 1-hour NOx standard would be exceeded along the reconductoring line. This is both a significant air quality impact (violation of a state ambient air quality standard) and a significant health impact, as the state NOx standard was set to protect public health.

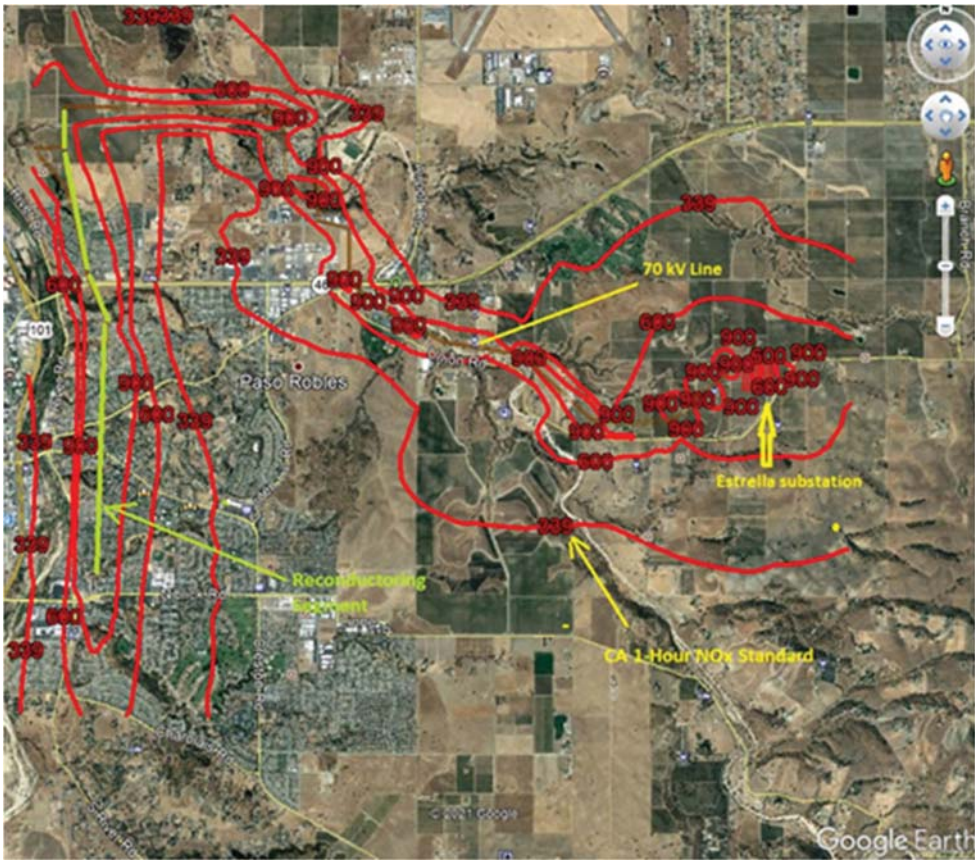
Figure 8: Ambient Construction NOx Concentrations (ug/m^3), Scenario 1[94]



The result of modeling construction NOx emissions assuming the use of all Tier 3 construction equipment are shown in Figure 9. This figure shows that the California 1-hour NOx ambient air quality standard would be reach 900 ug/m^3, nearly a factor 3 higher than the California 1-hour ambient air quality standard, in the vicinity of all Project components in locations with numerous sensitive receptors. This is both a significant air quality impact (violation of a state ambient air quality standard) and a significant health impact, as the state NOx standard was set to protect public health.

[94] Exhibit 20, Figure 4-6.

Figure 9: Ambient Construction NOx Concentrations, Scenario 2[95]



2.10. Significant Construction Health and Ambient NOx Impacts Must Be Mitigated

In sum, our analyses demonstrate significant health and air quality impacts that were not disclosed in the DEIR, as follows:[96]

[95] Exhibit 20, Figure 4-7.

[96] Exhibit 20, Table 5-1.

Summary of Maximum Project Level Health Risks				
Risk Metric	Scenario 1	Scenario 2	Significance Threshold	Significant?
Maximum Residential Cancer Risk	0.5 to 40 cancers per million	5 to 75 cancers/million	10 (per million)	Scenario 1 – Yes Scenario 2 - Yes
Maximum Acute Hazard Index from 1-Hour Exposure to DPM	0.1 to less than 0.5	1 to < 4	1.0	Scenario 1 – No Scenario 2 - Yes
Maximum Acute Impact from Exposure to 1-Hour NOx	100 to 500 ug/m^3	00 to 760 ug/m^3	339 ug/m^3	Scenario 1 – Yes Scenario 2 - Yes

The significant cancer and acute health impacts and wide-spread violations of the California 1-hour NOx ambient air quality standards can and must be mitigated by requiring the following measures: [97,98,99,100]

- Require the use of biodiesel in all construction equipment;
- Require the use of Tier 4 final engines in all construction equipment;
- Install engine particulate filters;[101]
- Install diesel oxidation catalysts;
- Prohibit and/or restrict unnecessary idling or lugging of engines;
- Limit idling to no more than 2 minutes, enforced by an on-site construction monitor;
- Restrict the amount of diesel-powered equipment and total engine horsepower operating in a given area;
- Modify and/or extend the construction schedule to minimize the amount of diesel-powered equipment operating in a given area at the same time;
- Relocate significantly impacted sensitive receptors;

[97] See, e.g., Michael C. Block, Application of Diesel Emissions Reduction Controls for Nonroad Construction Equipment, June 5, 2007 (e.g., CAT/Johnson Matthey (JMI) passive diesel particulate filter, p. 15-17); https://www.cdc.gov/niosh/mining%5C/UserFiles/workshops/dieselelko2007/2c-Block.pdf.

[98] See, e.g., U.S. Department of Labor, Hazard Alert: Diesel Exhaust/Diesel Particulate Matter; https://www.osha.gov/dts/hazardalerts/diesel_exhaust_hazard_alert.html; U.S. EPA, Reducing Emissions from Construction Equipment, January 2006; https://nepis.epa.gov/Exe/tiff2png.exe/P10039SN.PNG?-r+75+-g+7+D%3A%5CZYFILES%5CINDEX%20DATA%5C06THRU10%5CTIFF%5C00000342%5CP10039SN.TIF.

[99] MECA, What Is Retrofit?; http://www.meca.org/diesel-retrofit/what-is-retrofit.

[100] H. Fan, 2017; Exhibit 19.

[101] CARB 2020 in footnote 83.

- Require routine maintenance of construction equipment;
- Hire only highly skilled equipment operators; and
- Retain an on-site construction manager to assure all mitigation is achieved in practice.

3. VALLEY FEVER IMPACTS ARE SIGNIFICANT AND UNMITIGATED

The DEIR discloses that the Project is located in an area designated as "suspected endemic" for Valley Fever and that incidence rates for San Luis Obispo County per year per 100,000 population are among the highest rates in the state during 2011 to 2018. The DEIR also discloses that construction fugitive dust-causing activities have the potential to disperse Valley Fever spores, concluding "the potential for additional Valley Fever infections is high." However, the DEIR erroneously concludes, with no support, that "[m]itigation measures that reduce fugitive dust will also reduce the chances of dispersing CI spores."[102] This unsupported assertion is misleading and wrong.

Valley Fever, "coccidioidomycosis" or "cocci," is an infectious disease caused by inhaling the spores of *Coccidioides ssp*.[103,104] The Project area is not just "suspected endemic" but is endemic for Valley Fever,[105] confirmed with the highest infection rate in the County and one of the highest in California. The San Luis Obispo County Public Health Department reports that "people can get Valley Fever anywhere in San Luis Obispo County. More cases occur in the north and east parts of the county, where conditions are often more dusty and windy."[106] Figure 10A. The Project is located in these highly endemic areas. In fact, the most highly endemic area is zip code 93446, Atascadero (Figure 10B), where most of the sensitive receptors adjacent to construction work are located.[107] Thus, not only construction workers, but also residents near construction work in zip code 93446 are at risk of Valley Fever.

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[102] DEIR, p. 4.3-9, pdf 427.

[103] Two species of *Coccidioides* are known to cause Valley Fever: *C. immitis*, which is typically found in California, and *C. posadasii*, which is typically found outside California. See Centers for Disease Control, Coccidioidomycosis (Valley Fever), Information for Health Professionals; https://www.cdc.gov/fungal/diseases/coccidioidomycosis/health-professionals.html.

[104] D. R. Hospenthal, Coccidioidomycosis and Valley Fever, Medscape, updated August 27, 2019; https://emedicine.medscape.com/article/215978-overview.

[105] California Department of Public Health, Valley Fever Fact Sheet; https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ValleyFeverFactSheet.pdf.

[106] SLO Public Health Department, Valley Fever; https://www.slocleanair.org/air-quality/valleyfever.php.

[107] Sensitive receptors listed in PEA, Appendix A, all with addresses in zip code 93446.

Figure 10A: San Luis Obispo County Valley Fever Rates per 100,000, 2005–2015[108]

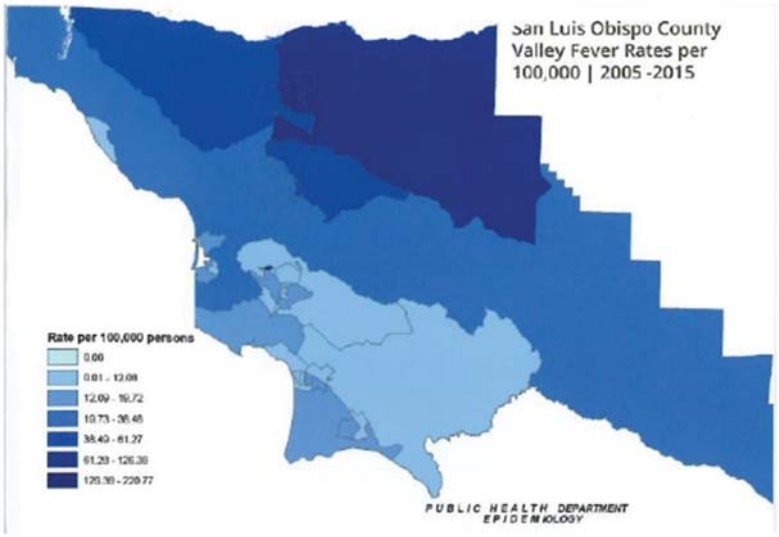
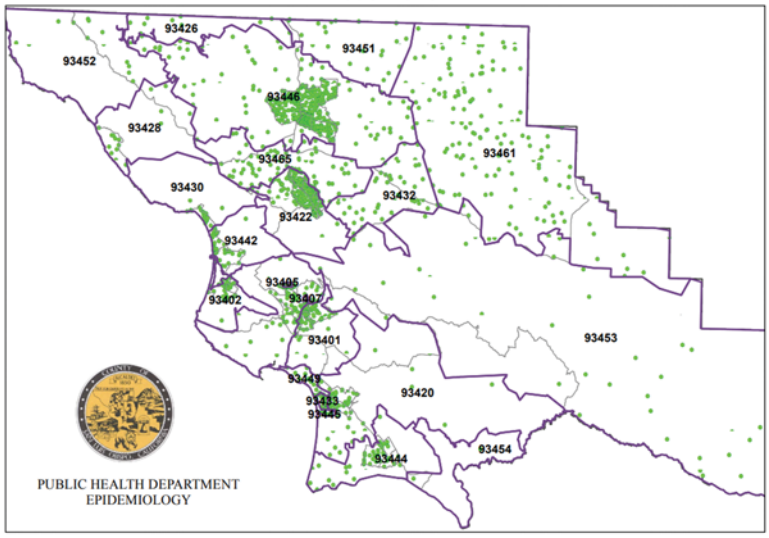


Figure 10B: San Luis Obispo County Valley Fever Cases 2005-2015[109]



San Luis Obispo County had more occupational Valley Fever outbreaks in 2011-2014 than any other county in California. Table 2.[110]

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[108] Ibid.

[109] Valley Fever Incidence Map; https://www.slocounty.ca.gov/Departments/Health-Agency/Public-Health/Forms-Documents/Epidemiology-and-Disease-Surveillance/Valley-Fever-Incidence_MAP_2005-2015.pdf.

[110] Marie A. de Perio et al., Occupational Coccidioidomycosis Surveillance and Recent Outbreaks in California, *Medical Mycology*, v. 57, issue Supplement 1, February 2019, pp. S41-S45; https://academic.oup.com/mmy/article/57/Supplement_1/S41/5300137.

Table 2: Summary of Work-Associated Outbreaks of Coccidioidomycosis—California, 2007–2014

Outbreak	Persons with clinically compatible illness	Laboratory confirmed cases	Hospitalizations	Disseminated disease
San Luis Obispo County, 2007[3,7]	10	8	0	1
Kern County, 2008	9	8	2	2
Ventura County, 2012[10]	10	5	2	1
San Luis Obispo County, 2011–2014[11,12]	133	44	9	2

Clinical manifestations of Valley Fever range from influenza-like illness to progressive pulmonary disease and, in 1% of infections, potentially fatal disseminated disease.[111] When soil containing this fungus is disturbed by activities such as digging, vehicle use, construction, dust storms, or during earthquakes, the fungal spores become airborne.[112,113] Valley Fever outbreaks during construction in California have been widely reported.[114,115,116,117,118,119,120] Spores raised during construction and/or wind

[111] Cummings et al., Point-Source Outbreak of Coccidioidomycosis in Construction Workers, *Epidemiology and Infection*, v. 138, no. 4, 2010, pp. 507-511, 2010 (Exhibit 6).

[112] California Department of Public Health, Valley Fever Fact Sheet, January 2016; https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ValleyFeverFactSheet.pdf. *See also* G. Sondermeyer Cooksey et al., Update on Coccidioidomycosis in California, pp. 20-21, *Medical Board of California Newsletter*, v. 141, Winter 2017; https://www.mbc.ca.gov/Download/Newsletters/newsletter-2017-01.pdf.

[113] Cummings et al. 2010 (Exhibit 6).

[114] Jason A. Wilken et al., Coccidioidomycosis among Workers Constructing Solar Power Farms, California, USA, 2011–2014, *Emerging Infectious Diseases*, v. 21, no. 11, November 2015; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4622237/.

[115] The Associated Press, Valley Fever Hits 28 at Calif. Solar Plant Sites, *The San Diego Union-Tribune*, May 1, 2013; http://www.sandiegouniontribune.com/sdut-valley-fever-hits-28-at-calif-solar-plant-sites-2013may01-story.html.

[116] G. L. Sondermeyer Cooksey et al., Dust Exposure and Coccidioidomycosis Prevention Among Solar Power Farm Construction Workers in California, *American Journal of Public Health*, August 2017 (Exhibit 7).

[117] Rupal Das et al., Occupational Coccidioidomycosis in California, Outbreak Investigation, Respirator Recommendations, and Surveillance Findings, *Journal of Occupational and Environmental Medicine*, May 2012, vol. 54, no. 5, pp. 564-571 (Exhibit 8).

[118] D. Pappagianis and the Coccidioidomycosis Serology Laboratory, Coccidioidomycosis in California State Correctional Institutions, *Annals of the New York Academy of Sciences*, v. 1111, pp. 103-111, 2007 (Exhibit 9).

[119] Cummings et al. 2010 (Exhibit 6).

[120] CDPH, Preventing Work-Related Coccidioidomycosis (Valley Fever), June 2013; https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/HESIS/CDPH%20Document%20Library/CocciFact.pdf.

storms,[121] which are common in the Project area (Figure 11), can result in significant worker and public health impacts. The spores are usually found 2 to 12 inches below the surface. The infectious dose is very low, typically less than 10 spores.[122]

Figure 11: Typical Dust Storm in Project Area[123]

"Workers disturbing soil in areas where Valley Fever is common are at highest risk," with construction workers topping the list.[124] Figure 12 shows an example from the California Department of Public Health (CDPH) website.[125]

Figure 12: Construction Crew Valley Fever

[121] P. L. Williams, D. L. Sable, P. Mendez, and L. T. Smyth, Symptomatic Coccidioidomycosis Following a Severe Natural Dust Storm: An Outbreak at the Naval Air Station, Lemoore, Calif, *Chest*, pp. 566-70, 1979; https://pubmed.ncbi.nlm.nih.gov/498830/.

[122] Jennifer McNary and Mary Deems, Preventing Valley Fever in Construction Workers, March 4, 2020, pdf 10; https://www.safetybayarea.com/media/2020-3A.pdf.

[123] McNary and Deems, 2020, pdf 50.

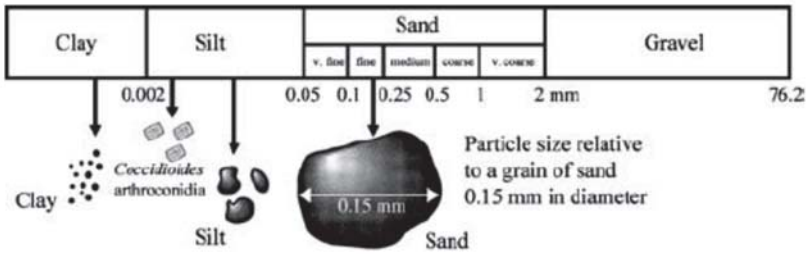
[124] Wilken et al. 2015, pdf 19.

[125] CDPH; http://elcosh.org/document/3684/d001224/preventing+work-related+coccidioidomycosis+(valley+fever).html.

However, the potentially exposed population is much larger than construction workers because the non-selective raising of dust during Project construction will carry the very small spores, 0.002–0.005 millimeters ("mm") (Figure 13), into off-site areas, potentially exposing large non-construction worker populations.[126,127] Many of the Project components, for example, are adjacent to sensitive receptors, including residential areas, schools, and parks. Fugitive dust containing Valley Fever spores from Project construction could result in significant public health impacts due to the proximity of numerous sensitive receptors.[128] Figure 10B. The DEIR failed to identify this significant risk.

Valley Fever spores are 1,250 to 5,000 times smaller than fugitive dust raised during construction.[129] Figure 13. Thus, standard construction dust mitigation measures specified in DEIR Appendix F are not effective at controlling them.

Figure 13: Size of Cocci Spores Compared to Soil Particles (in mm)[130]



Valley Fever spores can be carried on the winds into surrounding areas, exposing farm and vineyard workers, students at nearby schools, and residents adjacent to many of the construction sites. Valley Fever spores, for example, have been documented to travel as far as 500 miles,[131] and thus dust raised during construction could potentially expose a large number of people hundreds of miles away.

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[126] Schmelzer and Tabershaw, 1968, p. 110; Pappagianis and Einstein, 1978 (Exhibit 17).

[127] Pappagianis and Einstein, 1978, p. 527 ("The northern areas were not directly affected by the ground level windstorm that had struck Kern County but the dust was lifted to several thousand feet elevation and, borne on high currents, the soil and arthrospores along with some moisture were gently deposited on sidewalks and automobiles as "a mud storm" that vexed the residents of much of California." The storm originating in Kern County, for example, had major impacts in the San Francisco Bay Area and Sacramento) Exhibit 17.

[128] PEA, Appendix A.

[129] Relative to PM2.5: 2.5 mm/0.002 mm = **1,250**; Relative to PM10 = 10 mm/0.002 mm = **5,000.**

[130] Frederick S. Fisher, Mark W. Bultman, and Demosthenes Pappagianis, Operational Guidelines (version 1.0) for Geological Fieldwork in Areas Endemic for Coccidioidomycosis (Valley Fever), U.S. Geological Survey Open-File Report 00-348, 2000, Figure 3; https://pubs.usgs.gov/of/2000/0348/.

[131] David Filip and Sharon Filip, Valley Fever Epidemic, Golden Phoenix Books, 2008, p. 24 (Exhibit 15).

3.1. A Conventional Dust Control Plan Is Inadequate to Address Potential Health Risks Posed by Exposure to Valley Fever

Conventional dust control measures, such as those included in DEIR Appendix F, are not effective at controlling Valley Fever[132] because they largely focus on visible dust or larger dust particles—the PM10 fraction—not the very fine particles where the Valley Fever spores are found. While dust exposure is one of the primary risk factors for contracting Valley Fever and dust-control measures are an important defense against infection, it is important to note that PM10 and visible dust, the targets of conventional dust control mitigation, are only indicators that *Coccidioides ssp.* spores may be airborne in a given area. Freshly generated dust clouds usually contain a larger proportion of the more visible coarse particles, PM10 (</=0.01 mm), compared to cocci spores (0.002 mm). However, these larger particles settle more rapidly and the remaining fine respirable particles may be difficult to see and are not controlled by conventional dust control measures.

Spores of *Coccidioides ssp.* have slow settling rates in air due to their small size (0.002 mm), low terminal velocity, and possibly also due to their buoyancy, barrel shape, and commonly attached empty hyphae cell fragments.[133] Thus spores, whose size is well below the limits of human vision, may be present in air that appears relatively clear and dust free. Such ambient, airborne spores with their low settling rates can remain aloft for long periods and be carried hundreds of miles from their point of origin. Thus, implementation of conventional dust control measures will not provide sufficient protection for both on-site workers and the general public.

Further, infections by *Coccidioides ssp.* frequently have a seasonal pattern with infection rates that generally spike in the first few weeks of hot dry weather that follow extended milder rainy periods. In California, infection rates are generally higher during the hot summer months, especially if weather patterns bring the usual winter rains between November and April.[134] The majority of cases of Valley Fever accordingly occur during the months of June through December, which are typically periods of peak construction activity.

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[132] *See, e.g.*, Cummings and others, 2010, p. 509 (Exhibit 6); Schneider et al., 1997, p. 908 ("Primary prevention strategies (*e.g.*, dust-control measures) for coccidioidomycosis in endemic areas have limited effectiveness.") Exhibit 16.

[133] Fisher et al. 2007.

[134] Ibid.

3.2. The DEIR Fails to Require Adequate Mitigation for Valley Fever

The risk of Valley Fever at construction sites in California has been known for decades, and is particularly significant in San Luis Obispo County where the Project will be located. Adjacent Ventura County published Valley Fever construction mitigation measures in 2003, to be implemented in addition to conventional construction mitigation, as follows:[135]

1. Restrict employment to persons with positive coccidioidin skin tests (since those with positive tests can be considered immune to reinfection).
2. Hire crews from local populations where possible, since it is more likely that they have been previously exposed to the fungus and are therefore immune.
3. Require crews to use respirators during project clearing, grading, and excavation operations in accordance with California Division of Occupational Safety and Health regulations.
4. Require that the cabs of grading and construction equipment be air-conditioned.
5. Require crews to work upwind from excavation sites.
6. Pave construction roads.
7. Where acceptable to the fire department, control weed growth by mowing instead of discing, thereby leaving the ground undisturbed and with a mulch covering.
8. During rough grading and construction, the access way into the project site from adjoining paved roadways should be paved or treated with environmentally-safe dust control agents.

At two photovoltaic solar energy projects in San Luis Obispo County, Topaz Solar Farm[136] and California Valley Solar Ranch,[137] 44 construction workers contracted Valley Fever, including 13 electricians/linemen/wiremen; 11 equipment operators; 6 laborers; 5 carpenters/ironworkers/millwrights/mechanics; 4 managers/superintendents, and 3 others. Of these, 39% visited an emergency room, 20% were hospitalized, and 77% missed work.[138,139] Exposures included "performing soil-disruptive work, such as digging trenches, and working in a trench. In addition, workers reported working in a dust cloud or dust storm, and operating heavy

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[135] Ventura County Air Quality Assessment Guidelines, October 2003, pp. 7-7 to 7-8; http://www.vcapcd.org/pubs/Planning/VCAQGuidelines.pdf.

[136] U.S. Department of Energy, Final Environmental Impact Statement, Volume 1, Loan Guarantee to Royal Bank of Scotland for Construction and Startup of the Topaz Solar Farm, San Luis Obispo County, California, August 2011; https://www.energy.gov/sites/prod/files/Topaz-FEIS-Volume-I-PDF-Version.pdf.

[137] U.S. Department of Energy, Final Environmental Assessment, Volume 1, Loan Guarantee to High Plains II, LLC for the California Valley Solar Ranch Project in San Luis Obispo County and Kern County, California, August 2011; California Valley Solar Ranch; https://www.energy.gov/sites/prod/files/EA-1840-FEA-vol1-2011.pdf.

[138] McNary and Deems, 2020, pdf 22.

[139] Julie Cart, Officials Study Valley Fever Outbreak at Solar Power Projects, Los Angeles Times, April 30, 2013; https://www.latimes.com/local/la-xpm-2013-apr-30-la-me-solar-fever-20130501-story.html.

equipment without enclosed cabs, closed windows, and air-conditioned with high-efficiency particle (HEPA) filtration."[140]

Both of the EISs for these projects recognized Valley Fever impacts and included mitigation[141] that was much more comprehensive than the short list of conventional PM10 dust mitigation in the DEIR. The EISs for these projects contained no Valley Fever construction mitigation, recommending only conventional fugitive dust control measures. The Topaz Farm EIS, for example, recommended only to "reduce fugitive dust,"[142] concluding (as for the Project) with no analysis at all, that implementation of conventional dust control measures would reduce Valley Fever impacts to less than significant.[143] The California Valley Solar Ranch EIS only required "dust control measures" and provided no information on Valley Fever to workers and nearby residents.[144]

The Topaz Solar Farm EIS recommended the following dust control measures that are much more extensive than the short list in the Project EIR:

[140] de Perio et al., 2019, p. S-43.

[141] Topaz EIS, pp. 2-65/66, MM AQ-1.3 and California Valley Solar Ranch FEIR,, p. 3-126, 3-128 ("Dust control measures and the integration of San Luis Obispo Health Agency Interim Valley Fever Recommendations for Workers into construction operations would reduce exposure to Valley Fever. Therefore, effects on public or occupational health related to disease vectors would be negligible and not significant.").

[142]Topaz EIS, Volume I, March 2011, Table ES-4, AQ-1.3.

[143] Ibid., p. ES-16.

[144] Table 2-1, pdf 34 and 217.

MM AQ-1.3 **Reduce Fugitive Dust. Prior to issuance of construction permits and during construction/ground disturbing activities and decommissioning**, the Proposed Project shall implement the following measures to minimize nuisance impacts and to significantly reduce fugitive dust emissions:

a. The amount of disturbed area shall be reduced where possible;

b. Water trucks or sprinkler systems shall be used in quantities sufficient to prevent airborne dust from leaving the site. Watering frequency shall be increased whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water shall be used whenever possible;

c. All dirt stockpile areas shall be sprayed daily for dust suppression as needed;

d. Permanent dust control measures identified in the approved project revegetation and landscape plans shall be implemented as soon as possible following completion of any soil disturbing activities;

e. Exposed ground areas that are planned to be reworked at dates more than one month after initial grading shall be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established;

f. All disturbed soil areas not subject to revegetation shall be stabilized using approved chemical soil binders (identified in Section 4.3 of the APCD's CEQA Air Quality Handbook), jute netting, or other methods approved in advance by the APCD;

g. Paving for those roadways, driveways, sidewalks, etc., planned to be paved shall be completed as soon as possible. In addition, building pads shall be laid as soon as possible after grading unless seeding or soil binders are used;

~~a.~~h. Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved (i.e., without asphalt) surface at the construction site;

i. All trucks hauling dirt, sand, soil, or other loose materials shall be covered or shall maintain at least 2 feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with CVC Section 23114;

j. Wheel washers shall be installed where vehicles enter or exit unpaved roads from or onto streets, or trucks and equipment leaving the site shall be washed;

k. Streets shall be swept at the end of each day if visible soil material is carried onto adjacent public paved roads. Water sweepers with reclaimed water shall be used where feasible;

l. All of these fugitive dust mitigation measures shall be shown on grading and building plans; and

m. The contractor or builder shall designate a person or persons to monitor the fugitive dust emissions and enhance the implementation of the measures as necessary to minimize dust complaints, reduce visible emissions below 20 percent opacity, and prevent transport of dust offsite. Their duty hours shall include holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons shall be provided to the APCD Compliance Division **prior to the start of any grading, earthwork or demolition.**

In addition, the Applicant shall consult with the County Health Department to develop a Dust Management Plan that addresses management of dust to reduce the potential for exposure to Valley Fever. **Prior to issuance of permits**, the Applicant shall submit the Plan to the County Health Department for review and approval. The Plan shall include a program to evaluate the potential for exposure to Valley Fever from construction activities, and to identify appropriate dust management and safety procedures that shall be implemented, as needed, to minimize personnel and public exposure to potential Valley Fever–containing dust. Measures in the Plan, which shall be implemented as applicable, may include the following:

n. Provide HEP-filtered air-conditioned enclosed cabs on heavy equipment. Train workers on proper use of cabs, such as turning on air conditioning prior to using the equipment.

o. Provide communication methods, such as two-way radios, for use in enclosed cabs.

p. Provide National Institute for Occupational Safety and Health (NIOSH)-approved respirators for workers.

q. Require half-face respirators equipped with N-100 or P-100 filters to be used during digging. Require employees to wear respirators when working near earth-moving machinery.

r. Cause employees to be medically evaluated, fit-tested, and properly trained on the use of the respirators, and implement a full respiratory protection program in accordance with

the applicable Cal/OSHA Respiratory Protection Standard (8 CCR 5144).

s. Provide separate, clean eating areas with hand-washing facilities.

t. Thoroughly clean equipment, vehicles, and other items before they are moved offsite to other work locations.

u. Train workers to recognize the symptoms of Valley Fever, and to promptly report suspected symptoms of work-related Valley Fever to a supervisor.

v. Work with a medical professional to develop a protocol to medically evaluate employees who develop symptoms of Valley Fever.

w. Work with a medical professional, in consultation with the County Health Department, to develop an educational handout for on-site workers and surrounding residents within three miles of the project site, and include the following information on Valley Fever: what are the potential sources/ causes, what are the common symptoms, what are the options or remedies available should someone be experiencing these symptoms, and where testing for exposure is available. **Prior to construction permit issuance**, this handout shall have been created by the Applicant and reviewed by the County. **No less than 30 days prior to any work commencing**, this handout shall be mailed to all existing residences within three miles of the project boundaries.

Reduce Fugitive Dust. Prior to issuance of construction permits and during construction/ground disturbing activities and decommissioning, the Proposed Project shall implement the following measures to minimize nuisance impacts and to significantly reduce fugitive dust emissions:

a. The amount of disturbed area shall be reduced where possible;

b. Water trucks or sprinkler systems shall be used in quantities sufficient to prevent airborne dust from leaving the site. Watering frequency shall be increased whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water shall be used whenever possible;

c. All dirt stockpile areas shall be sprayed daily for dust suppression as needed;

d. Permanent dust control measures identified in the approved project revegetation and landscape plans shall be implemented as soon as possible following completion of any soil

Presumably, these measures, which are far more extensive than the few air quality mitigation measures included in DEIR APM AIR-3, were inadequate and/or not followed.

3.3. Recommended Mitigation to Control Valley Fever

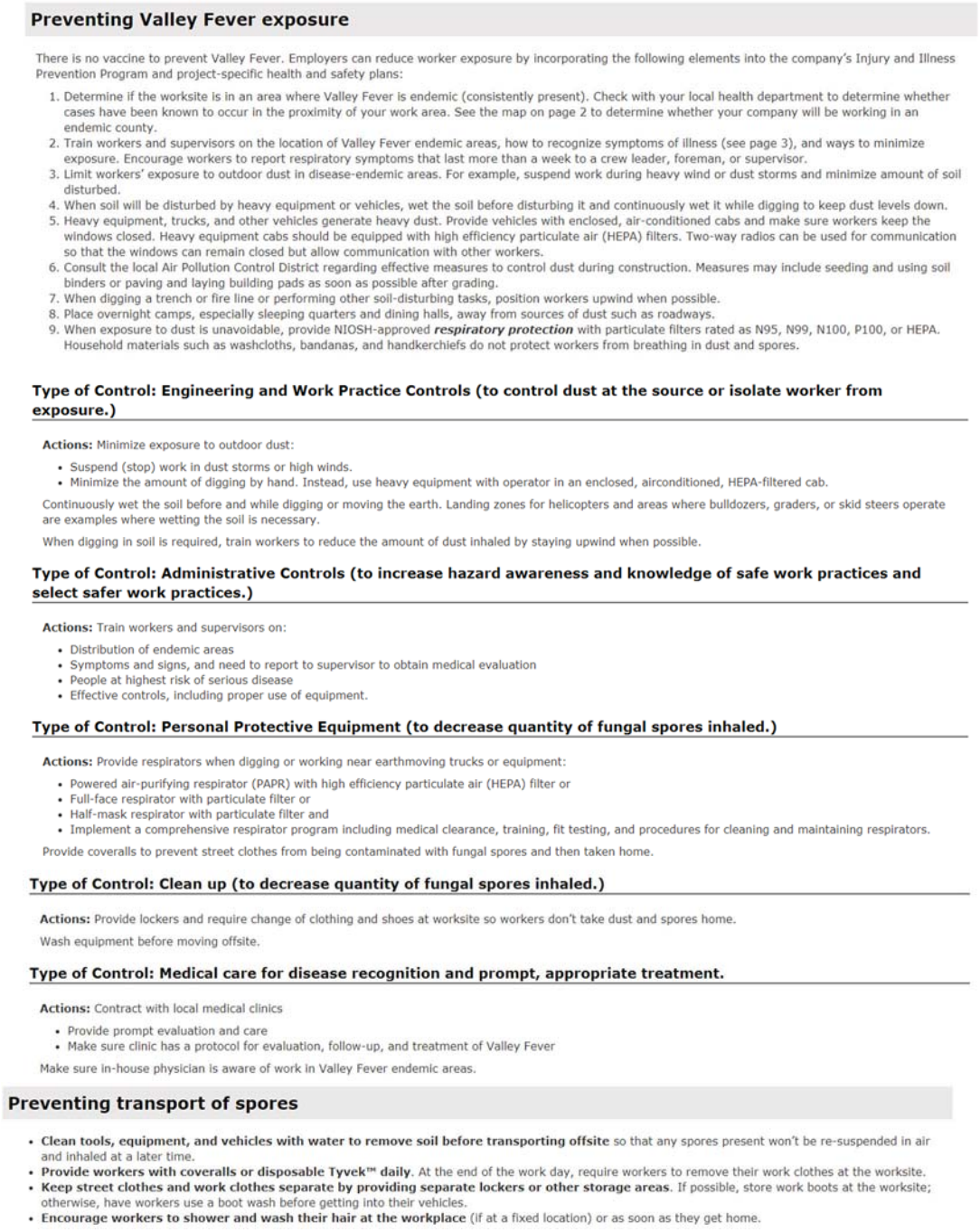
In response to these outbreaks within San Luis Obispo County,[145] its Public Health Department, in conjunction with the California Department of Public Health,[146] developed recommendations to limit exposure to Valley Fever based on scientific information from the published literature. The recommended measures, which failed to control Valley Fever, go far beyond the conventional dust control measures included in the DEIR.[147] Controls recommended to minimize workers' dust exposure and risk of Valley Fever in endemic areas based on the experience at these two solar sites included

[145] McNary and Deems, 2020, pdf 16 *et seq.*

[146] California Department of Public Health, Preventing Work-Related Coccidioidomycosis (Valley Fever), June 2013, pp. 4-7; https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/HESIS/CDPH%20Document%20Library/CocciFact.pdf. See also Wilken et al., 2015, and Sondermeyer Cooksey et al. (Exhibit 7).

[147] DEIR, Appendix F.

the following measures, none of which is required by the DEIR's construction mitigation measures:[148,149]



Preventing Valley Fever exposure

There is no vaccine to prevent Valley Fever. Employers can reduce worker exposure by incorporating the following elements into the company's Injury and Illness Prevention Program and project-specific health and safety plans:

1. Determine if the worksite is in an area where Valley Fever is endemic (consistently present). Check with your local health department to determine whether cases have been known to occur in the proximity of your work area. See the map on page 2 to determine whether your company will be working in an endemic county.
2. Train workers and supervisors on the location of Valley Fever endemic areas, how to recognize symptoms of illness (see page 3), and ways to minimize exposure. Encourage workers to report respiratory symptoms that last more than a week to a crew leader, foreman, or supervisor.
3. Limit workers' exposure to outdoor dust in disease-endemic areas. For example, suspend work during heavy wind or dust storms and minimize amount of soil disturbed.
4. When soil will be disturbed by heavy equipment or vehicles, wet the soil before disturbing it and continuously wet it while digging to keep dust levels down.
5. Heavy equipment, trucks, and other vehicles generate heavy dust. Provide vehicles with enclosed, air-conditioned cabs and make sure workers keep the windows closed. Heavy equipment cabs should be equipped with high efficiency particulate air (HEPA) filters. Two-way radios can be used for communication so that the windows can remain closed but allow communication with other workers.
6. Consult the local Air Pollution Control District regarding effective measures to control dust during construction. Measures may include seeding and using soil binders or paving and laying building pads as soon as possible after grading.
7. When digging a trench or fire line or performing other soil-disturbing tasks, position workers upwind when possible.
8. Place overnight camps, especially sleeping quarters and dining halls, away from sources of dust such as roadways.
9. When exposure to dust is unavoidable, provide NIOSH-approved ***respiratory protection*** with particulate filters rated as N95, N99, N100, P100, or HEPA. Household materials such as washcloths, bandanas, and handkerchiefs do not protect workers from breathing in dust and spores.

Type of Control: Engineering and Work Practice Controls (to control dust at the source or isolate worker from exposure.)

Actions: Minimize exposure to outdoor dust:

- Suspend (stop) work in dust storms or high winds.
- Minimize the amount of digging by hand. Instead, use heavy equipment with operator in an enclosed, airconditioned, HEPA-filtered cab.

Continuously wet the soil before and while digging or moving the earth. Landing zones for helicopters and areas where bulldozers, graders, or skid steers operate are examples where wetting the soil is necessary.

When digging in soil is required, train workers to reduce the amount of dust inhaled by staying upwind when possible.

Type of Control: Administrative Controls (to increase hazard awareness and knowledge of safe work practices and select safer work practices.)

Actions: Train workers and supervisors on:

- Distribution of endemic areas
- Symptoms and signs, and need to report to supervisor to obtain medical evaluation
- People at highest risk of serious disease
- Effective controls, including proper use of equipment.

Type of Control: Personal Protective Equipment (to decrease quantity of fungal spores inhaled.)

Actions: Provide respirators when digging or working near earthmoving trucks or equipment:

- Powered air-purifying respirator (PAPR) with high efficiency particulate air (HEPA) filter or
- Full-face respirator with particulate filter or
- Half-mask respirator with particulate filter and
- Implement a comprehensive respirator program including medical clearance, training, fit testing, and procedures for cleaning and maintaining respirators.

Provide coveralls to prevent street clothes from being contaminated with fungal spores and then taken home.

Type of Control: Clean up (to decrease quantity of fungal spores inhaled.)

Actions: Provide lockers and require change of clothing and shoes at worksite so workers don't take dust and spores home.

Wash equipment before moving offsite.

Type of Control: Medical care for disease recognition and prompt, appropriate treatment.

Actions: Contract with local medical clinics

- Provide prompt evaluation and care
- Make sure clinic has a protocol for evaluation, follow-up, and treatment of Valley Fever

Make sure in-house physician is aware of work in Valley Fever endemic areas.

Preventing transport of spores

- **Clean tools, equipment, and vehicles with water to remove soil before transporting offsite** so that any spores present won't be re-suspended in air and inhaled at a later time.
- **Provide workers with coveralls or disposable Tyvek™ daily**. At the end of the work day, require workers to remove their work clothes at the worksite.
- **Keep street clothes and work clothes separate by providing separate lockers or other storage areas**. If possible, store work boots at the worksite; otherwise, have workers use a boot wash before getting into their vehicles.
- **Encourage workers to shower and wash their hair at the workplace** (if at a fixed location) or as soon as they get home.

[148] CDPH, Preventing Work-Related Coccidioidomycosis (Valley Fever); https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/HESIS/CDPH%20Document%20Library/CocciFact.pdf.

[149] McNary and Deems, 2020, pdf 30-45.

In a more recent Valley Fever outbreak among solar plant construction workers in Monterey County, public health officials conducted a site visit to the solar farm to observe and interview workers and employers about work practices, dust control, and use of protective equipment; review training materials; and discuss prevention strategies. The visit confirmed dust control issues, serious lapses in use of respiratory protection, insufficient Coccidioidomycosis employee training, and no system for tracking or reporting illness. Thus, in November 2017, the CDPH issued prevention recommendations before the start of the second construction phase, which was scheduled to continue through the end of 2018. Recommendations for employers included:[150]

> (1) reducing dust exposure by ensuring ample and efficient water truck capacity to wet soil;
>
> (2) using only heavy equipment with enclosed cabs and temperature-controlled, high efficiency particulate air–filtered air;[151]
>
> (3) providing clean coveralls daily to employees who disturb soil;
>
> (4) implementing a mandatory respiratory protection program (8 CCR §5144, Respiratory Protection: https://www.dir.ca.gov/title8/5144.html) that specifically requires National Institute for Occupational Safety and Health–approved respirators be worn while performing or in the near vicinity of job activities that create airborne dust;
>
> (5) developing effective Valley Fever training for all employees, including ways to reduce exposure, how to recognize symptoms, and where to seek care; and
>
> (6) tracking and reporting of all suspected Valley Fever illnesses that occur at the worksite to the Imperial County Public Health Department.

The study concluded that prevention methods need to be better incorporated into the planning and monitoring of construction projects in areas with endemic *Coccidioides* (e.g., by involving public health practitioners in pre-project reviews). Specifically, the following was recommended: "Outdoor workers in these areas should

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[150] R. L. Laws, G. S. Cooksey, S. Jain and others, Coccidioidomycosis Outbreak Among Workers Constructing a Solar Power Farm—Monterey County, California, 2016–2017, *Morbidity and Mortality Weekly Report*, August 24, 2018, v. 67, no. 33, pp. 931-934; https://www.cdc.gov/mmwr/volumes/67/wr/pdfs/mm6733a4-H.pdf.

[151] De Perio et al.'s (p. S43) analysis of outbreaks at solar farms in San Luis Obispo County concluded that "frequently performing soil-disruptive activities was a risk factor only for employees who did not frequently use respiratory protection."

be trained by employers about the potential for infection, how to limit dust exposure, how to recognize symptoms, where to seek care, and how to ask a health care provider to assess them for coccidioidomycosis. Clinicians should inquire about occupational history and should suspect coccidioidomycosis in patients who are outdoor workers in areas with endemic *Coccidioides* and who have a clinically compatible illness."[152]

Similarly, the California Department of Public Health (CDPH) has summarized recommendations to control Valley Fever on its website.[153] The recommended measures are summarized in Table 3.

Table 3: CDPH Controls to Minimize Worker Dust Exposure

Summary of Controls to Minimize Workers' Dust Exposure and Risk of Valley Fever in Endemic Areas

Type of Control	Actions
Engineering and Work Practice Controls ➤ *to control dust at the source or isolate worker from exposure.*	Minimize exposure to outdoor dust: • Suspend (stop) work in dust storms or high winds. • Minimize the amount of digging by hand. Instead, use heavy equipment with operator in an enclosed, air-conditioned, HEPA-filtered cab. Continuously wet the soil before and while digging or moving the earth. Landing zones for helicopters and areas where bulldozers, graders, or skid steers operate are examples where wetting the soil is necessary. When digging in soil is required, train workers to reduce the amount of dust inhaled by staying upwind when possible.
Administrative Controls ➤ *to increase hazard awareness and knowledge of safe work practices and select safer work practices.*	Train workers and supervisors on: • Distribution of endemic areas • Symptoms and signs, and need to report to supervisor to obtain medical evaluation • People at highest risk of serious disease • Effective controls, including proper use of equipment.
Personal Protective Equipment ➤ *to decrease quantity of fungal spores inhaled.*	Provide respirators when digging or working near earth-moving trucks or equipment: • Powered air-purifying respirator (PAPR) with high efficiency particulate air (HEPA) filter or • Full-face respirator with particulate filter or • Half-mask respirator with particulate filter and • Implement a comprehensive respirator program including medical clearance, training, fit testing, and procedures for cleaning and maintaining respirators. Provide coveralls to prevent street clothes from being contaminated with fungal spores and then taken home.
Clean up ➤ *to decrease quantity of fungal spores inhaled.*	Provide lockers and require change of clothing and shoes at worksite so workers don't take dust and spores home. Wash equipment before moving offsite.
Medical care for disease recognition and prompt, appropriate treatment.	Contract with local medical clinics • Provide prompt evaluation and care • Make sure clinic has a protocol for evaluation, follow-up, and treatment of Valley Fever Make sure in-house physician is aware of work in Valley Fever endemic areas.

More recently, the California legislature has passed Assembly Bill No. 203 (AB 203),[154] which requires construction employers in counties where Valley Fever is highly

[152] Laws et al., p. 934.

[153] CDPH, Preventing Work-Related Coccidioidomycosis (Valley Fever); https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/HESIS/CDPH%20Document%20Library/CocciFact.pdf.

endemic to provide effective awareness training on Valley Fever to all employees annually and before an employee begins work that is reasonably anticipated to cause substantial dust disturbance. Section 6709(a) of this Act applies to construction employers with employees working at worksites in counties where Valley Fever is "highly endemic," which include San Luis Obispo County. The DEIR is silent on this rule. It should be recognized and included as a Project mitigation measure. AB 203 is a step in the right direction but is not adequate mitigation for the Project's Valley Fever construction impacts, which are highly significant as awareness training does not mitigate the impact.

3.4. The DEIR's Fugitive Dust Mitigation Program Will Not Control Valley Fever Spores

The DEIR's fugitive dust control measures proposed in APM AIR-3[155] do not include any of the mitigation measures identified in Comment 3.3 designed to control worker exposure to tiny Valley Fever spores. The only fugitive dust control measures required in the DEIR are:[156]

APM AIR-3. Minimize Fugitive Dust.

Reduce the amount of the disturbed area where possible.

- Use water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site.
- All dirt stockpile areas should be sprayed daily as needed.
- All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by San Luis Obispo Air Pollution Control District (SLOCAPCD).
- Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface.

[154] Assembly Bill No. 203, Chapter 712, Occupational Safety and Health: Valley Fever: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB203.

[155] DEIR, Appendix F, pp. F-16/17.

[156] DEIR, Appendix F, p. F-17/18.

- All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with California Vehicle Code Section 23114.
- Sweep streets at the end of each day if visible soil material extending over 50 feet is carried onto adjacent paved roads. Water sweepers with reclaimed water should be used where possible.

These are all standard construction fugitive dust (PM10) mitigation measures, required when Valley Fever is not anticipated. They include some of the mitigation measures in the EIS for the Topaz Solar Farm, where a major Valley Fever outbreak occurred.[157] However, the Topaz EIS contained even more conventional fugitive dust measures plus some mitigation measures directed specially at Valley Fever.[158] In spite of the Topaz measures, a major outbreak still occurred, indicating the requirement for more aggressive measures and on-site oversight to assure that they are implemented. As discussed below, none of the dust control mitigation measures in the DEIR are adequate to control fugitive dust or to address tiny Valley Fever spores as discussed below.

None of the mitigation measures in APM AIR-3 will significantly control Valley Fever spores,[159,160] which are orders of magnitude smaller than conventional construction dust. Thus, conventional dust control measures are not effective. Compliance with fugitive dust regulations developed by air districts where Valley Fever is an acknowledged issue is a far more effective method to control Valley Fever spores than the control measures in the DEIR. These regulations include Maricopa County Rule 310,[161] SCAQMD Rule 403,[162,163] and SJVAPCD Rule 8021.[164] However,

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[157] Department of Energy, Final Environmental Impact Statement, DOE Loan Guarantee for the Topaz Solar Farm, August 2011, Table 2-10, Conditions of Approval, MM AQ-1.3, pp. 2-64-65; https://www.energy.gov/sites/prod/files/Topaz-FEIS-Volume-I-PDF-Version.pdf.

[158] Table 2-10, MM AQ-1.3; https://www.energy.gov/sites/prod/files/Topaz-FEIS-Volume-I-PDF-Version.pdf.

[159] South Coast Air Quality Management District (SCAQMD), Fugitive Dust, Fugitive Dust Table XI-A; http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust.

[160] Western Governors' Association, WRAP Fugitive Dust Handbook, September 7, 2006 (WRAP Handbook); https://www.wrapair.org/forums/dejf/fdh/. Exhibit 10.

[161] Maricopa County Rule 310, Fugitive Dust from Dust-Generating Operations; https://www.maricopa.gov/DocumentCenter/View/5354/Rule-310---Fugitive-Dust-from-Dust-Generating-Operations-PDF?bidId=.

[162] SCAQMD Rule 403; http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-403.pdf.

even these rules do not go far enough. I recommend the following additional measures, discussed below.

3.4.1. Reduce Disturbed Area

The DEIR requires that the amount of disturbed area should be reduced "where possible." Valley Fever can only be controlled by eliminating disturbed areas. This is clearly not feasible at an active construction site. Instead, dust suppressants, such as polymer emulsions, should be applied to disturbed areas upon completion of disturbance (e.g., demolition).[165] Further, groundcover should be replaced "as quickly as possible" in disturbed areas.[166]

3.4.2. Water Trucks/Sprinkler Systems

This measure requires the use of "water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site." This is too general to be implemented and enforced. It would allow water trucks to drive along roads once a day or less frequently without accessing off-road areas where soil is being disturbed. At a minimum, water should be applied every 4 hours within 100 feet of a structure being demolished, every 3 hours to disturbed areas and to disturbed soils after demolition is completed, and at the end of each day of cleanup.[167] Soil should be wet both before and while digging and workers should stay upwind of digging, when feasible.[168] Sprinkler systems should be specified for areas inaccessible by water trucks. Further, watering frequency should be increased when wind speeds exceed levels known to raise dust in the local area,[169] typically around 15 mph at the Project site. An on-site wind measuring station should be required to monitor wind speed.

This measure fails to specify the minimum soil moisture that will be maintained by water trucks. The SCAQMD and WRAP Handbooks recommend a minimum soil

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[163] SCAQMD Rule 403 Implementation Handbook; http://www.aqmd.gov/docs/default-source/compliance/rule-403-dust-control-forms/rule-403-fugitive-dust-implementation-handbook-0120km-arc.pdf?sfvrsn=6.

[164] SJVAPCD Rule 8031, Bulk Materials; https://www.valleyair.org/rules/currntrules/r8031.pdf.

[165] SCAQMD, Table XI-A.

[166] SCAQMD, Table XI-A.

[167] SCAQMD, Table XI-A and WRAP Handbook, Table 3-7.

[168] CDPH, Preventing Valley Fever in Construction Workers, March 2020, pdf 44; https://www.safetybayarea.com/media/2020-3A.pdf.

[169] SCAQMD, Table XI-A.

moisture of 12% for earthmoving, achieved using a movable sprinkler system or a water truck and verification of moisture content by lab sample or a moisture probe.[170]

This measure does not specify a method to verify that the use of water trucks prevents airborne dust from leaving the site. Real time monitoring for tiny Valley Fever spores should be required at all construction site boundaries.

This measure also fails to address ground areas that are planned to be reworked at dates more than one month after initial grading. These areas should be sown with a fast-germinating, noninvasive grass seed and watered until vegetation is established. All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods.

3.4.3. Stockpile Areas (AIR-3)

This measure requires daily spraying of stockpile areas "as needed." The measure does not identify the spraying agent—for example, water is not efficient for tiny Valley Fever spores. The measure also does not require increased spraying frequency or covering during high wind events. Finally, no guidance is provided for when increased spraying is needed. This is not adequate.

Maricopa Rule 305.5, for example, requires open storage piles to be covered with a tarp, plastic, or other material, or to maintain a soil moisture content of at least 12% or to maintain a visible crust. The SCAQMD recommends five mitigation measures for storage piles, as follows:[171]

[170] SCAQMD, Table XI-A and WRAP Handbook, Table 3-7.

[171] SCAQMD, Table XI-E. Mitigation Measure Examples: Fugitive Dust from Storage Piles; http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust.

Table 4: Storage Pile Fugitive Dust Mitigation Measures

Source Activity	Mitigation Measure[1]
Storage pile wind erosion	Require construction of 3-sided enclosures with 50% porosity.
Storage pile wind erosion	Water the storage pile by hand or apply cover when wind events are declared.
Windblown dust from inactive areas[3]	Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
Windblown dust from disturbed areas[4]	Plant tree windbreaks on the windward perimeter of construction projects if adjacent to open land.
Windblown dust from disturbed areas[4]	Plant vegetative ground cover in disturbed areas as soon as possible.

In addition, the SCAQMD recommends requiring 3-sided enclosures with 50% porosity for storage piles and watering by hand at a rate of 1.4 gallons/hour-yard or covering when wind events occur.[172] All of these measures are feasible and should be required for the Project.

3.4.4. Vehicle Speed (AIR-3)

This measure limits construction vehicle speed to 15 miles per hour but fails to include off-site trucks delivering materials to the site. It also fails to include enforcement of the speed limit. The SCAQMD recommends enforcement of this limit by radar,[173] which should be required for the Project.

3.4.5. Cover Trucks (AIR-3)

This measure requires that trucks hauling dirt, sand, soil, or other loose material be covered **or** maintain at least 2 feet of freeboard. This is not adequate. Trucks should be tarped with a fabric cover **and** maintain a freeboard height of 12 inches to prevent Valley Fever spore blowoff.[174] Freeboard does not prevent blowoff of tiny Valley Fever spores, especially on windy days that are common in the area. Valley Fever spores can also be present on truck wheels and bodies, which are commonly required to be

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[172] SCAQMD, Table XI-B, Mitigation Measure Examples: Fugitive Dust from Materials Handling; http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust.

[173] SCAQMD, Table XI-A.

[174] SCAQMD, Table XI-A.

thoroughly cleaned before leaving the worksite. Further, open-bodied haul trucks should be kept in good repair to prevent spillage from beds, sidewalls, and tailgates.[175] The DEIR does not require vehicle cleaning and/or washing before leaving the site. AIR-3 should be expanded to include this measure.

3.4.6. Sweep Streets (AIR-3)

Sweeping generates fugitive dust that may contain Valley Fever spores that are not visible, so trackout should be limited to the maximum extent feasible. This measure fails to require methods to minimize trackout. The DEIR only requires water street sweeping at the end of each day only if visible soil material extending over 50 feet is carried onto adjacent paved roads. Valley Fever spores are not "visible," so this measure is worthless for controlling Valley Fever.

Trackout should be removed "immediately" out to 50 feet and nightly cleanup of the rest, not controlled after the fact. Access to unprotected routes should be limited and construction roadways should be paved.[176] Grizzly[177]/wheel wash systems should be installed adjacent to entrances to control carryout and trackout. Gravel pads,[178] 30 ft x 50 ft, 6 inches deep should be installed at access points and traffic routed over track-out control devices. Track-out control devices should be installed at all access points to public roads and mud/dirt should be removed from interior paved roads with sufficient frequency. Access must be limited to unprotected areas.[179] The SCAQMD recommends installing pipe-grid trackout-control devices to reduce mud/dirt trackout from unpaved truck exit routes.[180] These measures should be required for the Project.

Any trackout that remains after installing control devices should be immediately cleaned up on deposit to 50 feet and nightly cleanup of the rest. The SCAQMD

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[175] Maricopa Rule 205.12.

[176] WRAP Handbook, Table 3-8.

[177] A grizzly is a device (i.e., rails, pipes, or grates) used to dislodge mud, dirt, and/or debris from the tires and undercarriage of motor vehicles and/or haul trucks prior to leaving the worksite. See Maricopa Rule 310, Section 218, https://www.maricopa.gov/DocumentCenter/View/5354/Rule-310---Fugitive-Dust-from-Dust-Generating-Operations-PDF?bidId.

[178] A gravel pad is a layer of washed gravel, rock, or crushed rock that is at least one inch or larger in diameter that is located at the point of intersection of an area accessible to the public and a work site exit to dislodge mud, dirt, and/or debris from the tires of motor vehicles and/or haul trucks, prior to leaving the work site. These should conform to Maricopa Rule 310, Section 217.

[179] Maricopa County Rule 310.

[180] SCAQMD, Table XI-C, Mitigation Measure Examples: Fugitive Dust from Paved Roads; http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust.

recommends the following trackout measures, which are all feasible and should be required for the Project:[181]

Table 5: SCAQMD Mud/Dirt Trackout Control Measures

Mud/dirt trackout	Install pipe-grid trackout-control device to reduce mud/dirt trackout from unpaved truck exit routes.
Mud/dirt trackout	Install gravel bed trackout apron (3 inches deep, 25 feet long, 12 feet wide per lane and edged by rock berm or row of stakes) to reduce mud/dirt trackout from unpaved truck exit routes.
Mud/dirt trackout	Require paved interior roads to be 100 feet long, 12 feet wide per lane and edged by rock berm or row of stakes, or add 4 foot shoulder for paved roads.

3.5. Omitted Fugitive Dust Mitigation Measures

Many mitigation measures essential to control Valley Fever spores are omitted from the DEIR mitigation plan in APM AIR-3. The engineering firm of Bechtel was retained to develop methods to control Valley Fever at the San Luis Obispo County Solar Ranch Project.[182,183] Bechtel's recommendations and those of other agencies include the following additional mitigation measures that should be required for the Project. All of the measures discussed below shall be shown on grading and building plans. Further, the dust control plan should be available on site in an easily accessible location.

First, APM AIR-3 does not address active disturbance of soils when heavy equipment or vehicles are working an area. The CDPH recommends that "[w]hen soil will be disturbed by heavy equipment or vehicles, wet the soil before disturbing it and continuously wet it while digging to keep dust levels down."[184]

Second, the DEIR's mitigation measures fail to define "airborne dust." Valley Fever spores are orders of magnitude smaller than conventional construction "airborne dust," which is PM2.5 and PM10. Due to their size, Valley Fever spores cannot be effectively controlled using watering trucks. Further, watering trucks themselves generate fugitive dust, which in an endemic area may contain Valley Fever spores. Thus, wetting methods must be used that do not themselves raise dust. Analysis of the

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[181] Ibid.

[182] Bechtel, California Valley Solar Ranch Project, Valley Fever in San Luis Obispo County, 2011; https://slideplayer.com/slide/4441907/#.YATgxeOJBDE.gmail.

[183] Bechtel, Bechtel Environmental, Safety, and Health (BESH), VALLEY FEVER in San Luis Obispo County California Valley Solar Ranch Project 2011, Slide 13; https://slideplayer.com/slide/4441907/.

[184] CDPH, Preventing Work-Related Coccidioidomycosis (Valley Fever), pdf 4.

outbreaks at the San Luis Obispo solar farms concluded, for example, that "frequent wetting of soil before soil-disruptive activities was protective…"[185] The control of "airborne dust" does not assure that Valley Fever spores would be controlled.

Third, planned paving for roadway, driveway, sidewalks, and so forth, shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

Fourth, trucks and equipment leaving the site shall be washed and wheel washers shall be installed where vehicles enter or exit unpaved roads from or onto a street. Bechtel, for example, recommends "[e]quipment, vehicles and other items will be thoroughly cleaned to remove soil particles before they are moved offsite."[186]

Fifth, wherever possible, grading and trenching work should be phased so that earth-moving equipment is working well ahead or downwind of workers on the ground.[187]

Sixth, half-faced respirators equipped with N-100 or P-100 filters should be worn by those digging, grading, trenching, or performing other work involving soil disturbance.[188] Analysis of the outbreaks at the San Luis Obispo solar farms concluded, for example, that "frequently performing soil-disruptive work was a risk factor only for employees who did not frequently use respiratory protection…"[189] The DEIR does not require any respiratory protection.

Seventh, MM AQ-1 should clearly state that all of the fugitive dust mitigation measures apply to the helicopter landing/unloading areas.

Eighth, the contractor shall designate a person or persons to monitor the fugitive dust emissions to assure compliance and to enhance them as necessary to minimize dust and prevent transport of dust offsite. The names and telephone numbers of such persons shall be provided to the SLOCAPCD prior to the start of any grading, earthwork or demolition.

This dust control coordinator shall be present on site during all dust-generating operations, with the authority to stop any operations that create excessive dust. A dust

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[185] De Perio et al, p. S43.

[186] Bechtel, Fugitive Dust Reduction Measures, Slide 13; https://images.slideplayer.com/14/4441907/slides/slide_13.jpg.

[187] Ibid.

[188] Bechtel, Fugitive Dust Reduction Measures, Slide 14; https://images.slideplayer.com/14/4441907/slides/slide_14.jpg.

[189] De Perio et al, p. S43.

control coordinator must always be on site during dust-generating operations for any site that disturbs 5 acres or more.[190]

Ninth, in addition, the following standard measures recommended by public agencies must be added to the DEIR specifically to control Valley Fever spores:

- Suspend work during heavy wind or dust storms.[191] San Luis Obispo Health Agency specifically recommends: [192]
    - skip windy days,
    - postpone activities until wind calms down,
    - do activity in early morning hours when there is less wind,
        - wet down roadways and dampen soil to reduce blowing dust, especially when other workers are present,
        - if other workers are nearby or downwind, delay the activity until they move,
        - use equipment with an enclosed cab and air filtration system,
        - remove and bag coveralls and other dusty clothing when you leave the work site, so you don't bring dust into your car or home.
- Minimize the amount of soil disturbed.
- Require that water trucks and construction equipment have enclosed, air-conditioned cabs equipped with high-efficiency particulate air filters and two-way radios to facilitate communication when windows are closed.[193]
- Position workers upwind when digging trenches or fire lines or performing other soil-disturbing tasks.
- Locate overnight camps away from sources of dust.

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[190] Maricopa County Rule 310; Maricopa County Air Quality Department, Rule 310 Dust Permit, Dust Control Permit Help Sheet; https://www.maricopa.gov/DocumentCenter/View/41942/Rule-310-Dust-Control-Permit-Help-Sheet-PDF.

[191] De Perio et al., p. S43, for example, found that for San Luis Obispo County solar farm workers, "frequently being in a dust storm or dust cloud was associated with increased risk of having clinically compatible coccidioidomycosis, while frequent wetting of soil before soil-disruptive activities was protective…"

[192] County of San Luis Obispo Health Agency, Public Health Department, "For Activities That Stir Up Dirt or Dust"; https://www.slocounty.ca.gov/getattachment/f25735bf-7bcd-42d7-8fcd-de843ce071cc/Brochure-English-Valley-Fever-Building.aspx.

[193] Bechtel, Fugitive Dust Reduction Measure, Slide 14; https://images.slideplayer.com/14/4441907/slides/slide_14.jpg.

- When dust exposure is unavoidable, provide NIOSH-approved respiratory protection with particulate filters rated as N95, N99, N100, P100, or HEPA.[194]
- The WRAP Handbook similarly recommends a gravel apron, 30 ft x 50 ft by 6 inches deep to reduce mud/dirt trackout from unpaved truck exit routes.
- Minimize digging by hand, instead use heavy equipment with enclosed, air-conditioned, HEPA-filtered cabs.
- Use a dust control method that does not raise dust. Calcium chloride or the salt crust process, for example, achieve better control than water alone. Further, fine atomized sprays or mist sprays with droplet diameters of 60 µg, produced by swirl-type pressure nozzles or pneumatic atomizers, should be used on the watering trucks.[195]
- When digging in soil is required, train workers to reduce the amount of dust by staying upwind.

Tenth, basic dust control training should be required for all water truck drivers, all water pull drivers, and superintendents on sites larger than 1 acre.

In addition, the CDPH specifically recommends the following measures to prevent the transport of Valley Fever spores off-site:[196]

- Clean tools, equipment, and vehicles with water to remove soil before transporting offsite.
- Provide workers with coveralls or disposable Tyvek daily.
- Keep street clothes and work clothes separate by providing separate lockers or other storage areas.
- Encourage workers to shower and wash their hair at the workplace or as soon as they get home.
- Provide boot cleaning stations.
- Wet-clean tools and equipment.

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[194] Preventing Work-Related Coccidioidomycosis (Valley Fever), p. 5, item 9: "When exposure to dust is unavoidable, provide NIOSH-approved respiratory protection with particulate filters rated as N95, N99, N100, P100, or HEPA"; https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/HESIS/CDPH%20Document%20Library/CocciFact.pdf.

[195] Amar Solanki, Dust Suppression System, p. 15-19, 25; https://www.slideshare.net/abhi24mining/prevention-suppression-of-dust.

[196] CDPH, Preventing Valley Fever in Construction Workers, pdf 53 and CDPH, Preventing Work-Related Coccidioidomycosis (Valley Fever), June 2013, p. 6; https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/HESIS/CDPH%20Document%20Library/CocciFact.pdf.

Finally, a review of outbreaks in San Luis Obispo County, including interviews with affected workers, concluded that the following administrative controls should be required:[197]

> Administrative controls that promote safer work practice standards might include (1) ensuring that the worksite injury and illness prevention plan recognizes the risk of coccidioidomycosis and has criteria for temporarily suspending work when there is excessive dust or wind; (2) having onsite monitoring personnel who, when inadequate dust control is identified, have the ability to implement additional control measures or stop work; (3) training workers and supervisors about the risks and symptoms of coccidioidomycosis; and (4) encouraging ill workers to report their symptoms to supervisors (examples

In sum, construction mitigation measures in the DEIR are not adequate to control Valley Fever spores raised during Project construction and conventional fugitive PM10 dust. Projects that have implemented similar conventional PM10 dust control measures have experienced fugitive dust issues and reported cases of Valley Fever.[198,199,200] The above-discussed mitigation measures should be required for the Project.

3.6. Monitoring Should Be Required for Valley Fever Spores

Finally, as the proposed Project construction sites have the potential to contain Coccidioidomycosis spores and it is well known that they can easily become airborne when soil is disturbed,[201] the Project construction sites should be tested well in advance of construction to determine if spores are present. Accurate test methods have been developed and used in similar applications.[202,203] A study conducted in the Antelope

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[197] De Perio et al. 2019, p. S43.

[198] Herman K. Trabish, Green Tech Media, Construction Halted at First Solar's 230 MW Antelope Valley Site, April 22, 2013; http://www.greentechmedia.com/articles/read/Construction-Halted-At-First-Solars-230-MW-Antelope-Valley-Site.

[199] Julie Cart, 28 Solar Workers Sickened by Valley Fever in San Luis Obispo County, *Los Angeles Times*, May 1, 2013; http://articles.latimes.com/2013/may/01/local/la-me-ln-valley-fever-solar-sites-20130501.

[200] Topaz EIS, August 2011, Table 2-10, Conditions of Approval.

[201] Colson et al. 2017, p. 451, Exhibit 10 ("A correlation between soil disturbances due to large-scale renewable energy construction projects, agricultural management practices and PM10 fugitive dust emission with increased incidence of coccidioidomycosis was clearly indicated by results of this study."), p. 456 ("One such danger is *Coccidioides spp.* arthroconidia becoming airborne when soil is disturbed and dust mitigation measures are inefficient or absent.").

[202] J. R. Bowers et al., Direct Detection of Coccidioides from Arizona Soils Using CocciENV, a Highly Sensitive and Specific Real-time PCR Assay, *Medical Mycology*, 2018 (Exhibit 11); and Proceedings of the

Valley, slated for six solar ranches of varying sizes, concluded that soil analyses should be conducted before soil disturbance in endemic areas, noting: "Based on the findings of this study, we recommend that EIRs include soil analyses for *Coccidioides spp.* on land destined for construction of any type in endemic areas of the pathogen."[204] An Environmental Assessment for a solar project has required soil testing.[205]

In sum, all of the above health-protective measures recommended by the San Luis Obispo County Public Health Department, Monterey County Health Department, the California Department of Public Health, and others are feasible for the Project and must be required in a dust control plan included in the EIR that evaluates and mitigates the risk to construction workers, off-site workers at nearby vineyards and farms, nearby residents, school children, and passengers in vehicles on public roads from contacting Valley Fever. Many of these measures have been required by the County of Monterey in other EIRs.[206] They are also required in the EIR for the California High-Speed Train.[207] Even if all of the above measures are adopted, the DEIR must analyze whether these measures are adequate to reduce this significant impact to a level below significance. Further, soils at all of the sites proposed to be disturbed should be tested in advance of construction.

4. BATTERY ENERGY STORAGE SYSTEM (BESS) IMPACTS

The DEIR superficially evaluated two BESS alternatives, BS-2 and BS-3, to reduce peak loads during periods when energy use is higher during the summer to relieve pressure on substations and feeders.[208] Alternative BS-2 is a front-of-the-meter (FTM) site and alternative BS-3 is a third party, behind-the-meter solar and battery storage

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60th Annual Coccidioidomycosis Study Group Meeting, April 8–9, 2016, Fresno, CA; http://coccistudygroup.com/wp-content/uploads/2016/10/CSG-60th-Annual.pdf.

[203] Colson et al. 2017, pp. 439–458.

[204] Colson et al. 2017, p. 456.

[205] Final Environmental Assessment for Construction, Operation, and Decommissioning of a Solar Photovoltaic System at Marine Air Ground Task Force Training Command Marine Corps Air Ground Combat Center, Twentynine Palms, California, November 2015, Table ES-1, AQ-17; https://www.29palms.marines.mil/Portals/56/Docs/G4/NREA/Environmental%20Assessment%20Construction%20and%20Operation%20of%20Solar%20Photovoltaic%20System%20at%20MAGTFTC,%20MCAGCC%20(Final)%20November%202015.pdf.

[206] County of Monterey, California Flats Solar Project Final Environmental Impact Report, December 2014; https://www.co.monterey.ca.us/home/showdocument?id=48244.

[207] California High-Speed Rail Authority and U.S. Department of Transportation, California High-Speed Train Project Environmental Impact Report/Environmental Impact Statement, Fresno to Bakersfield, Mitigation Monitoring and Enforcement Program Amendments, September 2015.

[208] DEIR, p. ES-13, pdf 37. See Also Appendix B.

facility.[209] Both of these alternatives assume the BESSs would use lithium-ion batteries because they are the most space-efficient and cost-effective technology currently available.[210] The DEIR is full of unsupported excuses for failing to analyze the most significant impacts of these two alternatives—risk of upset, worker and public health impacts, and increases in emissions due to battery charging. Instead, it analyzes impacts that are not significant—aesthetic impacts and external fires.

These two alternatives have two significant environmental impacts that were not analyzed or even acknowledged in the DEIR: (1) accidents leading to significant on-site (to third party in-home hosts in BS-3) and off-site public health and off-site property damage (Comment 5) and (2) increases in criteria pollutant and greenhouse gas (GHG) emissions (Comment 6).

Rather than disclose the significant risk of upset and resulting significant off-site public health impacts of an accident involving lithium-ion batteries, which are proposed for the BESS alternatives (Comment 5), the DEIR makes the following excuses for declining to analyze these impacts:

- BESS sites "were selected as illustrative examples for the purposes of this CEQA analysis. Need for the reasonably foreseeable distribution components may not occur for up to 15 years… It is not possible to identify with certainty FTM BESS sites that could be selected by PG&E in the future. In addition, energy storage and other distributed alternatives are 15 years out and BESS technology is expected to advance within this timeframe."[211]
- "Because the specific characteristics of Alternatives BS-2 and BS-3 are unknown, these alternatives are evaluated for illustrative purposes in the DEIR. Consistent with CEQA Guidelines section 15145, no significance conclusions are provided for Alternative BS-2 and BS-3 impact discussions."[212] The DEIR also incorrectly asserts that "A full analysis of hypothetical DIDF (Distribution Infrastructure Deferral Framework) outcomes and types of DER (Distributed Energy Resources) solutions would be speculative and outside of the scope of this CEQA analysis."[213]

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[209] DEIR, Figure ES-3, pdf 43.

[210] See, e.g., DEIR, Table 3-18, pdf 321; p. 3-126, pdf 322; p. 3-112, pdf 308.

[211] DEIR, pdf 308.

[212] DEIR, p. 4-3, pdf 339.

[213] DEIR, p. 3-131, pdf 327.

- "Because FTM BESS sites were selected for illustrative purposes only, BESS installations have not been designed and technologies have not been selected, and the specifics of Alternative BS-2 are unknown, project-level determinations cannot be made as impacts are speculative. Therefore, consistent with CEQA Guidelines section 15145, no significance conclusion is provided for any of the significance criteria." [214]
- It is not possible to identify with certainty FTM BESS sites that could be selected by PG&E in the future. In addition, energy storage and other distributed energy resources (DER) technologies (e.g., demand response and energy efficiency) are expected to advance within this timeframe. These technological changes are likely to alter siting requirements. Because site-specific analyses are speculative at this time, this DEIR uses the illustrative sites to demonstrate the feasibility of this alternative, and the relatively small footprint these facilities would occupy throughout the project area."[215]

These excuses for failing to analyze the significant impacts of BESS alternatives are speculative and wrong. The analyses in the DEIR for "illustrative purposes" fail to identify the well-known significant environmental impacts of BESS facilities: accidents causing off-site public health and property damage impacts and increases in criteria pollutant and GHG emissions from BESS charging. Instead, the DEIR only discusses impacts of the BESS alternatives that are not significant—aesthetic impacts[216] and external wildfire impacts,[217] ignoring highly significant on-site and resulting off-site impacts caused by accidents involving the batteries themselves.

The DEIR, for example, only discloses the "potentially elevated fire hazard risk [of lithium-ion batteries] in comparison to other technologies."[218] However, it fails to extend its discussion of fires to on-site and off-site impacts, such as property damage and worker and public health impacts due to the release of hazardous air pollutants (HAPs).

The impacts of the proposed BESS facilities, based on experience with operating BESS facilities, are well known and should have been disclosed. The DEIR itself

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[214] DEIR, p. 4.1-53, pdf 393.

[215] DEIR, 3-112, pdf 308.

[216] DEIR, pdf 392 (Alternative BS-2) to 394 (Alternative BS-3).

[217] DEIR, Section 4.20 Wildfire.

[218] DEIR, 3-126, pdf 322.

proposes lithium-ion batteries at all FTM sites and additionally flow batteries at site #6.[219]

Finally, if it is not possible to analyze the impacts of BESS alternatives, a future EIR is required to analyze these impacts, if and when advances have been made in battery technology.

4.1. Impacts of Operating BESS Facilities Using Lithium-Ion Batteries

The starting point for any analysis is a review of the current state of knowledge regarding BESS impacts. The DEIR is silent on the history of BESS accidents, besides a brief mention of accidents involving batteries in electric vehicles and a fire at a 2 MW BESS in Arizona in 2019.[220] Instead, the DEIR asserts with no support that flow battery technology, which could be used at FTM Site 6, "would have reduced fire risk because the electrolyte material is not flammable."[221] However, reduced risk does not mean the risk is not significant.

Further, the use of flow batteries is severely limited at the available sites due to the large size of these batteries and the limited available space. Thus, the DEIR assumes the use of lithium-ion batteries at all of the potential BESS sites. Regardless, the electrolytes used in any storage battery may have impacts that were not disclosed. Finally, "reduced fire risk" does not mean the impact would not be significant.

The National Fire Protection Association (NFPA) recently published a brochure with the following title:[222]

ENERGY STORAGE SYSTEMS: IS YOUR COMMUNITY READY?

The answer for the communities and/or homes that will host a BESS under this Project is a resounding **NO**, because the DEIR has failed to disclose the risks or mitigate them.

The NFPA identified the follow impacts of energy storage systems, none of which are disclosed in the DEIR:[223]

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[219] DEIR, Table 3-18, pdf 321.

[220] DEIR, p. 4.9-39.

[221] DEIR, pdf 655.

[222] NFPA, Fire & Life Safety Policy Institute, Safety Through Better Public Policy, August 2019; https://www.nfpa.org/News-and-Research/Resources/Emergency-Responders/High-risk-hazards/Energy-Storage-Systems.

[223] NFPA, Energy Storage Systems Safety Fact Sheet, June 2020. Exhibit 18.

- Thermal runaway (rapid uncontrolled release of heat energy, resulting in fire or explosion);
- Shock hazard from stranded energy;
- Release of toxic and flammable gases;
- Deep-seated fires within metal or plastic casing, blocking firefighting agents;
- Mechanical abuse;
- Thermal abuse from exposure to external heat source;
- Electrical abuse from overcharging; and
- Environmental impacts including rodent damage to wiring, extreme heat, and floods.

4.2. Fires at Existing Battery Storage Facilities Demonstrate That Lithium-Ion Battery Fires Pose a Serious Risk to Human Health and the Environment

The NFPA brochure starts with this warning:[224]

> An explosion at a 4 megawatt battery energy storage systems (BESS) facility in April of 2019 is a reminder that this rapidly proliferating technology introduces new hazards into the community. The serious injury of several Arizona firefighters in that explosion highlights the pressing need to educate local officials and first responders on BESS.

The DEIR is silent on the serious risks of the proposed BESS facilities. Instead, it argues battery technologies will improve in the future and declines to evaluate the risks. Thus, a future EIR is required, as discussed below.

Fires at existing battery storage facilities demonstrate the severe risk that lithium-ion battery fires pose to human health and the environment. Fires have occurred at many battery storage facilities around the world, including in the European Union (e.g., Belgium).[225,226] Fires have also occurred at 23 battery storage facilities in South Korea, caused by faulty temperature control, negligence during construction, operational negligence, failure to separate the PCS system and batteries, faulty battery

[224] Ibid.

[225] Jason Deign, Engie Investigates Source of Belgian Battery Blaze, December 18, 2017; https://www.greentechmedia.com/articles/read/engie-investigates-source-of-belgian-battery-blaze#gs.y25569.

[226] Patrice Nigon and others, Battery Storage, IMIA Working Group Paper 112 (19), pdf 55, 58; https://www.imia.com/wp-content/uploads/2020/01/IMIA-WGP-112-19-Battery-Storage.pdf.

management, system control, or battery protection systems.[227] The largest fire loss in Korea was reported at a 47 MW BESS facility, estimated at US $18 million.[228] Figure 14.

Figure 14: Fire Damage at Korean BESS Facilities[229]

Several battery fires have occurred in Hawaii and Arizona. These fires resulted in significant impacts that are not addressed in the DEIR, including significant worker and public health impacts from hazardous air pollutants (HAPs) and damage to the adjacent facilities.

Two fires occurred at First Wind's 30 MW Kahuku project in Hawaii in 2012. The first fire broke out in March 2011. The second fire, on August 3, 2012, was so fierce that firefighters could not enter the building for several hours. They used dry chemicals, which failed. This fire resulted in a $30 million battery loss that closed the wind farm.[230]

In describing firefighting challenges at the Hawaiian 10-MW battery storage system, the Honolulu Fire Department reported: [231,232]

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[227] Andy Colthorpe, Korea's ESS Fires: Batteries Not to Blame But Industry Takes Hit Anyway, *PVTech*, June 19, 2019; https://www.energy-storage.news/news/koreas-ess-fires-batteries-not-to-blame-but-industry-takes-hit-anyway.

[228] Nigon and others, pdf 60.

[229] Ibid.

[230] Nigon and others, pdf 55.

[231] Fire at Kahuku Wind Farm Destroys Crucial Building, *Hawaii News Now*, August 1, 2012; https://www.hawaiinewsnow.com/story/19173811/hfd-battling-kahuku-wind-farm-blaze/.

[232] Michael A. Stosser, What Are the Risks and What Regulations Should We Consider, DOE Energy Storage Safety Meeting, 2014. See also https://www.energy.gov/sites/prod/files/2014/12/f19/OE%20Safety%20Strategic%20Plan%20December%202014.pdf; http://www.hawaiinewsnow.com/story/19173811/hfd-battling-kahuku-wind-farm-blaze/; https://www.scientificamerican.com/article/battery-fires-pose-new-risks-to-firefighters/.

"The risks from scalding heat, poisonous fumes, a collapsing structure and the potential for battery explosions kept firefighters outside the warehouse."[233] Firefighters at this site faced thick smoke, toxic fumes, and other hazards.[234,235] "The August … fire, the third since opening in March 2011, was so fierce that firefighters could not enter the building for seven hours."[236] Other fire departments have reported: "Basically you need to overwhelm it with more water than you think you need."[237]

The typical layout of battery storage facilities consists of rows of batteries with narrow separating aisles. The DEIR contains no information on the layout of batteries in any of the alternatives and thus fails as an informational document under CEQA. The DEIR should have included a diagram showing facility layout, including number of battery storage buildings (one or two?), battery spacing, design of sprinkler system, and location of ancillary facilities.

The fire stations that would respond to the fires are not nearby.[238] In the case of the Hawaii fires discussed above, a recent article in Scientific American reported: "By the time you get enough firefighting forces and the right extinguishing sources, the fire is going to progress quite a bit."[239] It also explained: "One important lesson is to have fire response resources on-site, like dry chemicals and deployment systems." Further,

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[233] Umair Irfan, Battery Fires Pose New Risks to Firefighters, Scientific American, February 27, 2015; available at: https://www.scientificamerican.com/article/battery-fires-pose-new-risks-to-firefighters/.

[234] Ibid.

[235] Ibid.

[236] Ros Davidson, Analysis: First Wind Project Avoids Storage After $30m Fire, *Wind Power*, March 6, 2014; https://www.windpowermonthly.com/article/1284038/analysis-first-wind-project-avoids-storage-30m-fire. See also Eric Wesoff, Battery Room Fire at Kahuku Wind-Energy Storage Farm, Energy Storage, August 3, 2012; https://www.greentechmedia.com/articles/read/battery-room-fire-at-kahuku-wind-energy-storage-farm#gs.xdxv6h and Nigon and others, 2019, pdf 55.

[237] Cameron Polom, Solar Storage Facilities Present Unique Hazard for Firefighters, *West Valley News*, April 21, 2019; https://www.abc15.com/news/region-west-valley/surprise/solar-storage-facilities-present-unique-hazard-for-firefighters.

[238] DEIR, Figure 4.15-1, pdf 785.

[239] Irfan 2015.

in the case of the Project, the facility would be unmanned in a rural location. This means firefighters from a distant location may have to extinguish a blaze without knowing what chemicals to use, where the electrical shutoffs are, or what kind of fire retardant to use.

Firefighters did not enter the building until 7 hours after the flames started due to questions about the toxicity of the 12,000 batteries. Two other fires occurred in the battery storage building, attributed to ECI capacitors in inverters from Dynapower.[240,241]

A fire broke out at a BESS in Wisconsin in 2016. The fire began in a utility-scale energy storage system that was in a partially assembled state that was not in operation and not connected to a power source or load. The fire occurred when a technician from the battery manufacturer was working on the energy storage system and was started in one of the DC power and control compartments adjacent to a battery rack. Once started, it spread to other batteries.[242]

Another major fire in the United States recently occurred on April 19, 2019, in Surprise, Arizona at the APS McMicken Energy Storage Facility, equipped with two 2-MW AES Advancion battery arrays.[243,244] An explosion in the McMicken battery system led to a fire.[245,246] This event injured eight firefighters, one critically.[247] Four firefighters

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[240] Eric Wesoff, Battery Room Fire at Kahuku Wind-Energy Storage Farm, GTM, August 3, 2012; https://www.greentechmedia.com/articles/read/battery-room-fire-at-kahuku-wind-energy-storage-farm#gs.9exghx.

[241] *Hawaii News Now*, August 1, 2012.

[242] Nigon and others, pdf 58.

[243] Ibid.

[244] Jennifer Runyon, APD Battery Energy Storage Facility Explosion Injures Four Firefighters; Industry Investigates, *Renewable Energy World*, April 23, 2019; https://www.renewableenergyworld.com/2019/04/23/aps-battery-energy-storage-facility-explosion-injures-four-firefighters-industry-investigates/.

[245] Arizona Public Service, Equipment Failure at McMicken Battery Facility, April 26, 2019; https://www.aps.com/en/About/Our-Company/Newsroom/Articles/Equipment-failure-at-McMicken-Battery-Facility.

[246] Julian Spector, What We Know and Don't Know About the Fire at an APS Battery Facility, April 23, 2019; https://www.greentechmedia.com/articles/read/what-we-know-and-dont-know-about-the-fire-at-an-aps-battery-facility#gs.9czowd.

[247] Eight AZ Firefighters Hurt, One Critically, in Explosion, Firehouse.Com News, April 20, 2019; https://www.firehouse.com/safety-health/news/21077221/eight-az-firefighters-injured-one-critically-in-a-large-utility-battery-explosion.

were hospitalized for chemical inhalation burns.[248] Of the firefighters injured, three required an extended hospital stay. The most serious injuries included a firefighter who had a "nose fracture, skull fracture, collapsed lung, rib fractures, broken tibia and fibula and an artery cut in his left leg." Others sustained multiple fractures, burns, and concussions.[249]

Firefighters are a significant at-risk population because batteries may rupture when exposed to extreme heat/fire, leaking corrosive materials, and/or emit toxic fumes, regardless of the specific battery technology. Burning batteries may emit acrid smoke, irritating fumes, and toxic fumes of fluoride, resulting in acute and chronic health effects in responding firefighters (and any nearby workers and residents). Acute health hazards include chemical inhalation burns and damage to lungs, eyes, and skin. Cobalt, present in lithium-ion batteries, is a suspected human carcinogen.[250]

The McMicken Facility fire was not the first APS battery fire. Another smaller fire has been reported at another APS system.[251] In November 2012, a 1.5-MW system at the APS Elden Substation near Flagstaff, Arizona, also caught fire.[252] The root cause analysis for this fire identified a near-miss in May 2012 when a battery cell was severely discharged and the cell was continuously charged against its intended design.[253] Arizona Public Service recently shut down two other battery systems following the explosion.[254]

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[248] Julian Spector, What We Know and Don't Know About the Fire at an APS Battery Facility, GTM, April 23, 2019; https://www.greentechmedia.com/articles/read/what-we-know-and-dont-know-about-the-fire-at-an-aps-battery-facility#gs.w82d63.

[249] Chris Dubay, Vice President/Chief Engineer, National Fire Protection Association, ENR Letters, August 21, 2019; https://www.enr.com/articles/47377-letter-battery-storage-fire-risks-need-greater-attention.

[250] Honeywell, Material Safety Data Sheet, Lithium-Ion Battery; https://honeywellaidc.force.com/supportppr/s/article/Lithium-ION-battery-specifications-MSDS-shipping-LI-ION-batteries.

[251] Karl-Erik Stromsta, APS and Fluence Investigating Explosion at Arizona Energy Storage Facility, *GTM*, April 22, 2019; https://www.greentechmedia.com/articles/read/aps-and-fluence-investigating-explosion-at-arizona-energy-storage-facility#gs.9cnh9x.

[252] H. J. Mai, APS Storage Facility Explosion Raises Questions about Battery Safety, *Utility Dive*, April 30, 2019; https://www.utilitydive.com/news/aps-storage-facility-explosion-raises-questions-about-battery-safety/553540/. See also Eckhouse and Chediak, April 24, 2019; Nigon and others 2019, pdf 57; and Colthorpe, June 2019.

[253] Sandra D. Kennedy, Commissioner, Re: In the Matter of the Commission's Inquiry of Arizona Public Service Battery Incident at the McMicken Energy Storage Facility Pursuant to Arizona Administrative Code R14-2-101, Docket No. E-01345A-19-076, August 2, 2019, p. 2; https://docket.images.azcc.gov/E000002248.pdf.

[254] Mai, April 30, 2019.

The Arizona Corporation Commission (ACC) recently reviewed the 2019 APS McMicken Energy Storage Facility and 2012 APS Elden Substation near-miss and concluded that "utility scale lithium-ion batteries using the chemistries in those types of lithium-ion batteries are not prudent and create unacceptable risks, particularly those with chemistries that include compounds that can release hydrogen fluoride in the event of a fire and/or explosion."[255]

Other battery fires have occurred on airplanes, including in a Dreamliner 787 at Heathrow Airport,[256] in-flight on an All Nippon Airways 787 over Japan, forcing an emergency landing, and aboard a Japan Airlines 787 at Boston's Logan International Airport, resulting from the release of flammable electrolytes, heat damage, and smoke on the aircraft.[257]

My review of the limited available information in the DEIR indicates that the proposed BESS options will use batteries with similar chemistries, mostly notably chemicals that include compounds that can release hydrogen fluoride and other toxic chemicals. Tests on a range of battery compositions revealed that they all release toxic chemicals.[258] If other batteries are used, or there are advances in lithium-ion technologies, as suggested in the DEIR, a subsequent DEIR should be prepared to evaluate any new impacts.

The chemical composition of the lithium-ion batteries based on current lithium-ion technology includes cobalt oxide; manganese dioxide; nickel oxide; carbon; unidentified electrolyte; polyvinylidene fluoride; aluminum foil; copper foil; aluminum; and inert materials.[259] However, the DEIR failed to support battery composition with MSDSs from potential battery suppliers, to indicate the relative amounts of each compound present in the battery, or to confirm that no other chemicals were present. A recent letter from Tesla to the Arizona Corporation Commission explained that the term "lithium-ion batteries":[260]

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[255] 8/2/19 APS Report.

[256] AIG, Lithium-ion Battery Energy Storage Systems: The Risks and How to Manage Them; https://www.aig.co.uk/content/dam/aig/emea/united-kingdom/documents/Insights/battery-storage-systems-energy.pdf.

[257] Nigon and others, pdf 55.

[258] Consolidated Edison and NYSERDA, Considerations for ESS Fire Safety, February 9, 2017.

[259] Imperial County Planning and Development Services, Draft Supplemental Environmental Impact Report. Prepared by Burns McDonnell, July 15, 2019, pdf 78, Sec. 2.6.3.9; http://www.icpds.com/?pid=6973.

[260] Letter from Sarah Van Cleve, Manager, US Energy Policy, Tesla, Inc., to Arizona Corporation Commission, Re: Tesla Response to Commissioner Kennedy's August 2nd Letter Regarding Lithium-Ion

> actually encompasses a broad set of storage technologies – there are many different sub-chemistries of lithium-ion batteries, each with their own unique characteristics. Common lithium-ion sub-chemistries for stationary storage include nickel manganese cobalt oxide (NMC) and lithium iron phosphate (LFP) but there are many other sub-chemistries such as lithium manganese oxide (LMO) and nickel cobalt aluminum oxide (NCA). Different types of lithium-ion battery systems have different properties and associated risks.

Polyvinylidene fluoride decomposes into hydrogen fluoride gas in fires.[261] Hydrogen fluoride is an extremely poisonous gas.[262] As there are residences within 500 feet of the facility, a fire in the BESS would likely result in significant health impacts to nearby residents, as well as workers at the adjacent shopping mall in Alternative BS-3. Thus, the DEIR fails as an informational document under CEQA for failing to include an MSDS and other characterization data on the batteries that would be used and for failing to evaluate the health and other impacts of a BESS fire.

Further, the cobalt, nickel, copper, aluminum, and manganese in these batteries could be volatilized at the very high temperatures encountered in battery fires and result in significant environmental impacts, including adverse health impacts to firefighters, workers, and residents; and toxicity to vegetation, including farm crops in surrounding fields. These potential impacts are not disclosed or analyzed in the DEIR.

The 2019 Kennedy analysis of the Arizona fires discloses fires with flame lengths of 10 to 15 feet that grew into flame lengths of 50 to 75 feet. The Flagstaff Fire Department Report for the 2012 incident expressed concerns about "a serious risk of a large-scale explosion." The ACC concluded that "a similar fire event at a very large lithium-ion battery facility (250 MW+) would have very severe and potentially catastrophic consequences, and that responders would have a very difficult time trying to handle such an incident." The 2019 Kennedy report goes on to conclude:

Battery Safety/Docket No. E-01345A-19-0076, August 19, 2019; https://docket.images.azcc.gov/E000002454.pdf.

[261] Craig L. Beyler and Marcelo M. Hirschler, Thermal Decomposition of Polymers, Chapter 7, Table 1-7.1; https://pdfs.semanticscholar.org/d3fa/4a1616fd1457c02d4f477dcbdae706c9667f.pdf; Material Safety Data Sheet, Poly(vinylidene fluoride), ("Combustion products include carbon monoxide (CO), carbon dioxide (CO_2), **hydrogen fluoride**, and other pyrolysis products typical of burning organic material" (emphasis added)), pdf 3; http://datasheets.scbt.com/sc-264080.pdf.

[262] CDC, Facts About Hydrogen Fluoride (Hydrofluoric Acid): "Breathing in hydrogen fluoride at high levels or in combination with skin contact can cause death from an irregular heartbeat or from fluid buildup in the lungs"; https://emergency.cdc.gov/agent/hydrofluoricacid/basics/facts.asp. See also ATSDR, Medical Guidelines for Hydrogen Fluoride; https://www.atsdr.cdc.gov/MMG/MMG.asp?id=1142&tid=250.

To appropriately plan for such a catastrophic event, the large-scale lithium ion battery facility using the same chemistries as the APS Elden Substation (Flagstaff) facility fire and the McMicken facility would need to be built in isolation far from everything else, because an explosion could potentially level buildings at some distance from the battery facility site. The energy stored at a 2 MW battery facility is equivalent to 1.72 tons of TNT. The energy stored at a 250 MW battery facility is equivalent to 215 tons of TNT. Also, large amounts of hydrogen fluoride could be released and dispersed that would affect and harm the public at a substantial distance downwind. There would be concerns also about lingering hydrogen fluoride contamination in the affected areas.

Based on this analysis, an explosion at the proposed BESS alternatives BS-2 and BS-3 would be equivalent to 47 and 103 tons of TNT, respectively.[263] This is sufficient to seriously damage adjacent residential neighborhoods, vineyards, shopping malls, commercial properties, schools, and parks, resulting in significant property damage, mortality, and health impacts to residents, agricultural, vineyard and other workers. The DEIR fails as an informational document under CEQA for failing to disclose and evaluate the risk and consequences of explosions and fires at the proposed BESS alternatives. If these impacts are not analyzed in the FEIR for this Project, a future EIR will be required to analyze them. The NFPA concluded as follows based on the experience in Arizona:[264]

> However, as the Arizona fire illustrates, this technology is not risk free. BESS technologies, which are typically large configurations of chemical batteries, can explode, catch fire, and release toxic gases under certain conditions. They are also subject to the phenomena of thermal runaway, which means they can burn intensely for significant periods of time.
>
> These hazards are dangerous for firefighters and for anyone else nearby an emergency incident. Policymakers must make sure first responders and other officials have the tools necessary to deploy BESS safely.

In contrast to lithium-ion battery hazards, reviewed above, there is no published operating history on flow batteries. These batteries contain electrolytes, including vanadium and zinc, which can be toxic to the environment or to people.[265] Further, their size limits their application to large stationary industrial applications, and their complex system of pumps, sensors, vessels, and so on, provide ample opportunity for upsets with the potential to release electrolytes into the environment.

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[263] The 2 MW battery at the Arizona McMicken facility is equivalent to 1.72 tons of TNT. Thus, Project alternative BS-2 (55 MW) is equivalent to (1.72)(55/2) = **47 tons TNT** and BS-2 (120 MW) is equivalent to (1.72)(120/2) = **103 tons TNT**.

[264] NPFA, August 2019, p. 1.

[265] David Rosewater, First Responder Safety for Grid Energy Storage, Sandia National Laboratories, 2015, pdf 14, 21; https://www.osti.gov/servlets/purl/1334066.

In sum, there is no BESS technology that will not have significant impacts, given the proximity of sensitive receptors to all proposed BESS sites. The EIR must be revised to disclose their impacts, or a future EIR must be prepared to evaluate these impacts when the battery technology is selected.

4.3. Impacts of Flow Batteries

The DEIR suggests that flow batteries would solve the significant impacts of lithium-ion batteries discussed in Comments 4.2 and 5, stating "Flow battery technology, which could be deployed at FTM Site 6, would have reduced fire risk because the electrolyte material is not flammable."[266] However, flow batteries have potentially significant impacts that were not disclosed in the DEIR. A recent report explains:[267]

> Flow batteries have two electrolytes- catholyte for the positive electrode (cathode) and anolyte (anode) for the negative electrode. The terms cathode and anode correspond to reduction and oxidation occurring at positive and negative terminals during discharge. Flow battery electrolytes can be hazardous in several ways including acidity and toxicity. Acidity is measured on the ph scale. Flow battery electrolyte is not especially acidic when compared to lead-acid battery electrolyte (close to ph = 0). If human skin is exposed to electrolyte, it may cause rashes or chemical burns if not treated quickly. Similarly, eye contact may result in irritation, lacrimation, pain, redness, corneal burns, and possible permanent, partial, or complete blindness if not treated quickly. The toxicity of the electrolyte has additional effects if ingested, inhaled, or released to the environment. Large pools from electrolyte spills can generate localized gas clouds that can be hazardous to human health. In an analysis of a hypothetical 500-gallon spill from a specific vanadium redox flow battery, with reasonable assumptions about hydrochloric acid (HCl) concentration in solution, spill volume, ground absorption, and local weather conditions, HCl concentrations in the air could reach potentially lethal exposure levels, after 60 minutes, at a range of 28m from the edge of the spill (using acute exposure guideline levels (AEGL)). Note that vanadium redox electrolyte can also contain sulfuric acid. As high temperatures can reduce vapor pressures significantly, a coincident fire can exasperate the toxicity hazard, however flow battery electrolytes are generally not flammable. While these specific figures do not apply across all technologies, the hazard from chemical off-gassing of large spills should be considered in the design, siting, installation, and emergency response procedures.

Further:[268]

> When the positive and negative charged electrolytes mix at a high state-of-charge, significant heat is generated, with violent release of toxic and/or flammable gases. For a vanadium flow battery, hydrogen and oxygen may be released, for a mixed acid vanadium flow battery, chlorine may also be released. Hence it is critical that the electrolytes that are stored in separate tanks, do not mix. This requires secondary containment for each tank. The secondary containment volume must be sufficiently large to accommodate the electrolyte volume contained in the tank. The electrolyte captured in the secondary containment may not be reused before treatment. Proper procedure for treating this spilled electrolyte before reuse has yet to be standardized and may lead to a delay in restoring system functionality.
>
> The ecological impact of a large spill should also be considered. The material safety data sheet (MSDS) from a large zinc bromide flow battery manufacturer describes that major components of their electrolyte "are considered to be very harmful to aquatic life" [51]. So, proximity to nearby water sources or aquifers should be taken into consideration in siting.

The DEIR fails as an informational document under CEQA for failing to disclose these significant impacts of flow batteries.

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[266] DEIR, pdf 655.

[267] David Rosewater and others, Grid-scale Energy Storage Hazard Analysis & Design Objectives for System Safety, Sandia Report SAND2020-9360, August 2020, p. 31; https://www.sandia.gov/ess-ssl/wp-content/uploads/2020/09/Rosewater-APS.pdf.

[268] Ibid.

4.4. Battery Handling and Transportation Accidents

CEQA Guidelines Section 15126.2(c) requires a discussion of any significant irreversible environmental change that would be caused by a project. A project would result in significant irreversible changes if it involves uses in which irreversible damage could result from any potential environmental accidents associated with the project.[269] The batteries will likely be shipped from warehouses in unknown location(s) and transported to the site from these undisclosed locations by undisclosed means (rail, truck, ship?), over undisclosed routes and roadways. Transportation could result in crush or puncture damage, possibly leading to the release of electrolyte material along transport routes or in storage. These routes could include sensitive habitat that would be irreversibly damaged in the event of a transportation accident. Further, an explosion triggered by a fire during handling and transportation could result in injuries and deaths of workers and motorists.

Lithium-ion batteries are sensitive to damage, especially during handling and transport.[270] They are also sensitive to high ambient temperatures,[271] which will be experienced by the Project's batteries as they will likely have to pass through sensitive biological habitat in desert areas. It is well known that battery accidents occur during handling, loading, and unloading in warehouses and during transportation.[272] The DEIR fails to discuss the risk of accidents during battery storage, handling, and transportation to the site and thus fails as an informational document under CEQA.

5. IMPACTS OF PROPOSED BESS FACILITIES

The DEIR's screening process identified two BESS alternatives that were carried forward for analysis in the DEIR: BS-2, battery storage to address the distribution need; and BS-3, third-party, behind-the-meter solar and battery storage.[273]

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[269] 14 CCR § 15126.2; DSEIR, p. ES-8.

[270] Kjell-Arne Jonsson, The Dangerous Consequences of Taking Shortcuts When Shipping Lithium-Ion Batteries, March 9, 2018; http://info.nefab.com/lib-blog/lithium-ion-batteries-shipping-shortcuts.

[271] Allianz Risk Consulting, Lithium-Ion Batteries, Risk Bulletin, 2017; https://www.agcs.allianz.com/content/dam/onemarketing/agcs/agcs/pdfs-risk-advisory/risk-bulletins/ARC-Lithium-Ion-Batteries.pdf.

[272] FAA Office of Security and Hazardous Materials Safety, Lithium Batteries & Lithium Battery-Powered Devices, August 1, 2019; https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf.

[273] DEIR, Sections 3.3.7 and 3.3.8.

5.1. The DEIR Omits Risk of Upset Analyses

The proposed BESS alternatives are very close to many sensitive receptors, requiring a formal risk of upset analysis to estimate potential public health and property damage risks. The Alternative Screening Report admits that "fire risk is a concern with BESS installations (particularly lithium-ion BESSs)…" and further asserts that "should BESS facilities catch fire, they could potentially pose a hazard to fire fighters and other first responders due to their chemical components. These issues will need to be fully evaluated in the EIR..."[274] This is confirmed by the review in Comment 4.2.

However, the DEIR contains no analysis of these issues for any alternative, which typically requires a formal risk of upset analysis. Thus, the DEIR fails as an informational document under CEQA. Instead, the Alternative Screening Report asserts similar facilities "in other parts of the world ( ) suggest that any fire risk of BESS facilities can be adequately mitigated."[275] However, the Screening Report and DEIR fail to disclose the history of accidents at BESS facilities, therefore failing as an informational document under CEQA. The proximity of sensitive receptors to the proposed BESS alternatives and the history of accidents at these facilities (Comment 4.2) require the preparation of formal risk of upset analyses, which likely will eliminate many potential BESS sites from consideration.

5.1.1. Alternative BS-2

This alternative would reduce peak loads during the summer to relieve pressure on the area substations and feeders. The batteries would discharge stored energy to the grid during peak demand and charge from the grid during hours of low demand (e.g., nighttime).[276]

The potential locations of BS-2 battery sites are shown in DEIR Figures ES-3 and 3-16. Land use designations for these sites are summarized in DEIR Table 3-17. This summary shows that some of these alternatives are located near sensitive receptors. Four potential sites are located within residential land uses (FTM Sites 2, 3, 4, 8); one is located in a "regional commercial" land use, the Woodland Shopping Center (FTM Site 2) and is likewise near residential areas;[277] and one is located adjacent to the CAL FIRE Attack Base, next to the Paso Robles Municipal Airport (FTM Site 5). The other two (FTM Sites 6 and 7) are designated as located within "county other" and unidentified

[274] DEIR, Appendix A, p. 3-73, pdf 109.

[275] Ibid.

[276] DEIR, p. 3-112, pdf 308.

[277] DEIR, Appendix A, pdf 93, Figure 3-13.

"public facilities." The locations of alternatives close to areas where sensitive receptors would be located—in residential and commercial areas—are summarized in Figure 15. In addition, FTM Site 7, not shown on Figure 17, is located close to a church.[278]

Figure 15: BESS Alternatives Located Near Sensitive Receptors[279]

FTM Site 1:

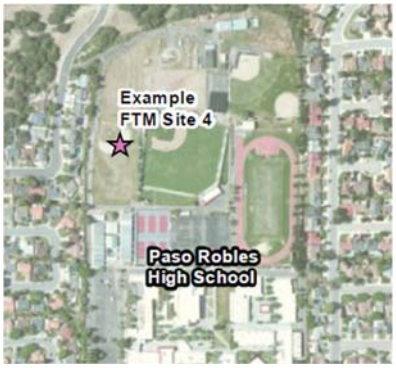
FTM Site 2:

FTM Site 3:

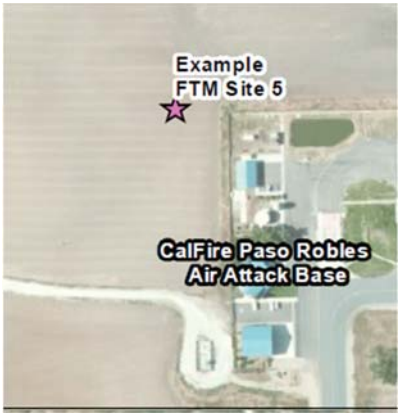
[278] DEIR, p. 4.3-10, pdf 428.

[279] DEIR, Figure 3-16, pdf 309.

FTM Site 4:



FTM Site 5:



Despite the numerous nearby sensitive receptors, the DEIR failed to analyze impacts of accidents. The DEIR indicates that the BESS technology that would be used at these eight sites is lithium ion, with the exception of Site #6, where both lithium-ion and flow batteries[280] are proposed.[281] Lithium-ion batteries were ultimately selected for evaluation due to space requirements of the redox flow batteries[282] and lack of experience with this technology.[283,284]

The DEIR explains that lithium-ion batteries are the most space-efficient and cost-effective technology currently available, particularly at sites such as those with

[280] DEIR, p. 3-126, pdf 322.

[281] DEIR, Table 3-18, pdf 321.

[282] DEIR, Appendix B, p. 3-65, pdf 101 and Table 3-8, p. 3-70, pdf 106.

[283] SDGE, Innovative Battery Storage Technology Connected to the California Grid, April 30, 2019; https://sdgenews.com/article/innovative-battery-storage-technology-connected-california-grid.

[284] Jens Noak and others, Redox Flow Batteries for Renewable Energy Storage, Energy Storage Summit 2021; https://www.energy-storage.news/blogs/redox-flow-batteries-for-renewable-energy-storage.

limited available space (e.g., sites 1-4).[285] The DEIR states that the analysis of these alternatives was based on 2019 Tesla Megapack specifications and redox flow batteries, enclosed in buildings.[286]

The DEIR mentions that lithium-ion BESSs have downsides, "such as potentially elevated fire hazard risk in comparison to other technologies."[287] The DEIR also explains that the alternative to lithium-ion batteries, redox flow batteries, offers "potential advantages, such as long lifecycles, low temperature ranges for operation, and easy scalability…" and "may have reduced fire risk compared to lithium-ion batteries, but they require the use of liquid electrolyte with high concentrations of acid."[288] However, due to the significantly larger footprint of redox flow batteries, they would be best suited to FTM Site #6, where there is ample space.[289] Further, redox flow batteries are not yet commercially available. The DEIR fails to mention the hazards associated with flow batteries, which include large tanks of electrolytes, including vanadium, zinc-bromine, and organic compounds[290]—toxic compounds that would be released into the environment in an accident. Comment 5.1.

The DEIR repeatedly points to the fire risk of the BESS alternatives. The Hazards and Hazardous Material section, for example, explains with respect to Alternative BS-2:[291]

> and 8 would both be within the SRA HFHSZ, and thus would have elevated fire risk. Fire risk is a concern with BESS installations (particularly lithium-ion BESSs) and could pose a hazard to fire fighters and other first responders due to their chemical components. Fires associated with electric vehicles and various consumer electronics have shown that lithium-ion batteries have the potential to catch fire (Business Insider 2019; CNET 2016). Lithium-ion batteries contain a flammable electrolyte and have the potential for "thermal runaway," which is a self-perpetuating cascade process where one compromised battery cell ignites adjacent cells, potentially resulting in a large-scale fire (SP Global 2019). Fires have occurred at utility-scale lithium-ion BESS installations, including one at the 2 MW BESS in Surprise, Arizona in April of 2019; however, utility-scale lithium-ion BESSs have been widely deployed in the U.S. (SP Global 2019; U.S. Energy Information Administration 2019). Improved safety standards are in development and safety certifications have been developed to reduce fire safety risk from lithium-ion BESSs as much as possible (SP Global 2019). Flow battery technology, which could be deployed at FTM Site 6, would have reduced fire risk because the electrolyte material is not flammable.

It also explains with respect to Alternative BS-3:[292]

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[285] DEIR, p. 3-126, pdf 322.

[286] DEIR, Alternative B, p. 3-60, pdf 96.

[287] Ibid.

[288] Ibid.

[289] DEIR, p. 3-127, pdf 323.

[290] Robert F. Service, New Generation of "Flow Batteries" Could Eventually Sustain a Grid Powered by the Sun and Wind, *Science*; https://www.sciencemag.org/news/2018/10/new-generation-flow-batteries-could-eventually-sustain-grid-powered-sun-and-wind.

[291] DEIR, p. 4.9-39, pdf 655.

> Lithium-ion BTM storage facilities could pose a fire safety hazard (see discussion under Alternative BS-2 above), but, when installed properly, this risk can be greatly mitigated. It is assumed that all applicable local codes and requirements would be followed for the permitting, siting, and installation of third-party BTM facilities that may result from procurement via the DIDF.

The Wildfire section of the DEIR similarly recognizes the fire hazards of BESS alternatives BS-2 and BS-3. As to alternative BS-2:[293]

> serve to minimize ignition potential and related wildfire risks. Once constructed, BESSs (in particular, lithium-ion BESSs) may present a fire risk, particularly for FTM sites located within the SRA, such as the illustrative FTM Sites 6 or 8. UL 9540 is a safety standard specifically designed for electrochemical BESSs and includes, among other things, size and separation requirements to prevent a fire originating in one BESS unit from propagating to adjacent units (i.e., thermal runaway) (UL LLC 2020). Implementation of this standard, along with compliance with local laws and regulations for fire safety, would reduce potential impacts from BESSs related to fire risk. Further, FTM BESSs under Alternative BS-2 would be operated remotely and, therefore, these facilities would not expose structures or people to pollutant concentrations from a wildfire, uncontrolled spread of wildfire, and/or expose people or structures to significant downslope or downstream flooding, landslide affects, and post-wildfire-related hazards.

As to Alternative BS-3:[294]

> ignition. As discussed in Section 4.9, "Hazards and Hazardous Materials," BTM solar systems and BESSs do have some potential to increase fire hazard during operation. It is assumed that all applicable local codes and requirements would be followed for the permitting, siting, and installation of third-party BTM installations that may result from procurement via the DIDF. No new or additional infrastructure (e.g., roads, fuel breaks, or emergency water sources) would likely need to be installed or maintained as a result of Alternative BS-3.

The PEA acknowledges these impacts and states that "[t]hese issues will need to be fully evaluated in the EIR…"[295] However, the EIR fails to evaluate these issues, instead just repeating the unsupported assertions in the PEA.

Thus, mitigation relies on "local codes and requirements" to prevent BESS accidents, without ever disclosing what those codes and requirements are or evaluating their potential effectiveness.

First, it is well known that "local codes and requirements" do not prevent accidents, which are often triggered by external events or defective battery cells.[296] A helicopter accident, a traffic accident, a terrorist attack, or an external fire could cause an accident.

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[292] DEIR, p. 4.9-41, pdf 657.

[293] DEIR, p. 4.20-21, pdf 903.

[294] DEIR, p. 4.20-22, pdf 904.

[295] DEIR, Appendix A, pdf 109, p. 3-73.

[296] See, for example, Andy Colthorpe, Arizona Battery Fire's Lessons Can be Learned by Industry to Prevent Further Incidents, DNV GL Says, *Energy Storage*, Summer 2021, July 29, 2020; https://www.energy-storage.news/news/arizona-battery-fires-lessons-can-be-learned-by-industry-to-prevent-further.

However, despite recognizing some of the hazards of the BESSs, the DEIR fails to actually analyze them, which is typically done in a "risk of upset analysis." A risk of upset analysis should have been prepared for favored BESS alternatives BS-2 and BS-3. As shown in Figures 2 and 5, these alternatives are very close to sensitive receptors. Alternative BS-2 is adjacent to a shopping mall and BS-3 is surrounded by dense residential neighborhoods. Thus, an accident at these facilities would result in significant impacts, including potentially property damage, health impacts from toxic chemicals, and even mortality. Thus, the DEIR fails as an informational document under CEQA for failing to disclose and mitigate these risks.

5.2. The DEIR Omits Hazards Associated with the Transportation and Disposal of Batteries

The PEA states that "[o]ther potential impacts of BESSs include hazards associated with recycling and disposal of batteries and materials at the end of their usable life. BESSs contain hazardous materials, which could expose workers, the public, or the environment to risks if not disposed of properly. This is another area that will be evaluated in the EIR…"[297]

The DEIR contains a section on "hazards and hazardous materials"[298] under Impact HAZ-1, "create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials." However, the DEIR fails to address the impacts associated with the transportation of the batteries to the site and their disposal.

The DEIR does not disclose how the batteries will be transported to the site (ship, rail, flatbed truck), the transportation routes, details of on-site storage during construction, where the batteries will be manufactured and recycled, or the routes and means of transport to the recycling center. Accidents can occur during transport, storage, and recycling. Lithium-ion batteries are sensitive to damage, especially during handling and transport.[299] It is well known that battery accidents occur during handling, loading, and unloading in warehouses and during transportation.[300] The DEIR is also silent on the disposal of the batteries at the end of their useful life.

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[297] DEIR, Appendix A, p. 3-73, pdf 109.

[298] DEIR, Section 4.9, pdf 617.

[299] Kjell-Arne Jonsson, The Dangerous Consequences of Taking Shortcuts When Shipping Lithium-Ion Batteries, March 9, 2018; http://info.nefab.com/lib-blog/lithium-ion-batteries-shipping-shortcuts.

[300] FAA Office of Security and Hazardous Materials Safety, Lithium Batteries & Lithium Battery-Powered Devices, August 1, 2019; https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf.

CEQA Guidelines Section 15126.2(c) requires a discussion of any significant irreversible environmental change that would be caused by a project. A project would result in significant irreversible changes if it involves uses in which irreversible damage could result from any potential environmental accidents associated with the project.[301] The batteries will likely be shipped from a factory or warehouses in unknown location(s) and transported to the site from these undisclosed locations by undisclosed means (rail, truck, ship?), over undisclosed routes and roadways. These routes could include sensitive desert habitat that would be irreversibly damaged in the event of a transportation accident. Further, an explosion triggered by a fire during handling and transportation could result in injuries and deaths of workers and motorists and could irreversibly damage the immediately adjacent CSE facility, as well as other nearby solar facilities.

6. OPERATIONAL GREENHOUSE GAS EMISSIONS ARE UNSUPPORTED, UNDERESTIMATED, AND SIGNIFICANT

The DEIR estimated criteria pollutants and greenhouse gas (GHG) emissions from Project operation and concluded they were not significant.[302] However, as discussed below, the DEIR omitted the major sources of these emissions, which when included result in significant GHG impacts.

DEIR Table 4.8-1 indicates that the major source of GHG emissions is construction, primarily "ground-based construction" (2,025 MT CO_2e) and helicopter emissions (699 MT CO_2e). A secondary source of operational emissions is sulfur hexafluoride (SF_6) from Project equipment (96 MT CO_2e/yr).[303] These emissions are underestimated and exclude the major source of Project GHG emissions, operation of the BESS facilities.

6.1. Operational GHG Emissions

The Project is a major source of operational GHG emissions, which arise from three sources: (1) sulfur hexafluoride (SF_6) used in Project equipment; (2) helicopters patrolling power lines;[304] and (3) charging of the BESSs. The DEIR fails to support the SF_6 emissions and omits the latter two sources of emissions.

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[301] 14 CCR § 15126.2; DSEIR, p. ES-8.

[302] DEIR, Section 4.8.

[303] DEIR, Table 4.8-1, pdf 407.

[304] DEIR, p. 2-87, pdf 167.

6.1.1. Sulfur Hexafluoride (SF_6)

The DEIR reports 96 MT CO_2e/yr from sulfur hexafluoride (SF_6) leakage from "gas insulated switches and equipment"[305] and asserts that emission support is in Appendix C.[306] Appendix C to the DEIR does not contain any support for the SF_6 emissions. Instead, the support for these emissions is in Appendix C of the PEA.

6.1.2. CO_2e Emissions from the Use of Helicopters for Facility Inspection

The DEIR indicates that annual inspections of the 70 kV power line segment will be conducted either "from the ground or by helicopter… The inspection process involves routine patrols from existing local staff either on the ground or by helicopter tasked with patrolling the power lines."[307] Elsewhere, "[r]outine maintenance of the power line structures and conductors would require travel overland on access roads or off-road and may require the use of helicopters to access the site."[308] In the discussion of noise: "[t]he use of a helicopter… for routine maintenance inspection was evaluated separately."[309] Further, nesting bird survey will be accomplished by ground surveys and/or by helicopter…"[310] The DEIR does not include any GHG emissions from the use of helicopters for these inspection activities.

6.2. Emissions from Charging the BESSs

The batteries in BESS facilities must be charged with energy from the grid. The generation of this energy emits GHGs and criteria pollutants. Further, a BESS requires electricity to operate its ancillary cooling and control systems, including inverters, transformers, and HVAC units. The DEIR did not include emissions from any of these sources. As demonstrated below, GHG emissions from the Project are significant and unmitigated when battery charging emissions are included.

The emissions from Project operation depend on how many megawatt hours (MWh) of generation are required to charge the Project batteries, which grid sources are

[305] DEIR, Table 4.8-1.

[306] DEIR, p. 4.8-6, pdf 606.

[307] DEIR, pdf 167, 767, 812.

[308] DEIR, pdf 682.

[309] DEIR, pdf 747.

[310] DEIR, pdf 174.

the marginal sources[311] of supply during the hours when Project charging or discharging is occurring, and the emission rates of those grid sources. The number of MWh of charging energy required will in turn depend on the expected Project generation and the Project efficiency (the percentage of charging energy which can be recovered as generation during discharge).

The DEIR contains no information on the net generation of electricity needed to operate the proposed BESS(s). Absent regulatory requirements or mitigation measures to the contrary, battery storage facilities store whatever energy is the cheapest and displace whatever is the most expensive, with no concern for emissions that would result from this exchange.

If the charging energy is from conventional sources, such as gas or coal-fired generation, charging will generate emissions as those sources would not otherwise operate because there would be no market for them. That fraction is likely quite low because only a small fraction of solar generation (and virtually no non-solar renewable generation) is curtailed[312] generation that could be used for battery charging. Thus, if charging occurs in hours when the marginal fuel in the CAISO-controlled grid is a fossil fuel, the facility would increase GHG and criteria pollutant emissions that were not included in the DEIR's analyses.

The DEIR makes no commitment that the batteries will be charged with renewable energy. The DEIR states that the BESSs will "defer the need for additional distribution capacity… to 'shave' peak loads during periods when energy use along these feeders is high (i.e., reduce peak loads during summer) to relieve pressure on the area substations and feeders. BESSs would likely operate on a daily cycle where they would discharge during hours of peak demand and charge during hours of lower demand (e.g., nighttime)."[313]

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[311] The marginal source of supply in a given hour is the source whose output would be increased if demand increases in that hour from the previous hour, or whose output would be decreased in that hour if demand decreases in that hour from the previous hour.

[312] Renewable energy is "curtailed" when it could have been physically produced (e.g., the sun is shining or the wind is blowing), but it was not produced due to economic (e.g., prices too low to be worth generating) or electrical system factors (e.g., the renewable generation would cause a nonrenewable generator to be turned off that is expected to be needed in the near future, without adequate time to restart it if it is turned off, and thus the CAISO orders renewable curtailment to avoid nonrenewable curtailment). The great majority of curtailment in California to date has been economic (over 99% in 2017, in 2018, and in 2019). Comparable data are not currently available for 2020. See http://www.caiso.com/Documents/Wind_SolarReal-TimeDispatchCurtailmentReportDec31_2017.pdf; http://www.caiso.com/Documents/Wind_SolarReal-TimeDispatchCurtailmentReportDec31_2018.pdf; and http://www.caiso.com/Documents/Wind_SolarReal-TimeDispatchCurtailmentReport Dec31_2019.pdf.

[313] DEIR, pdf 37, 308.

The DEIR is silent on the source(s) of the charging energy, a phrase that is absent from the DEIR and how often or how much renewable energy, if any, will be used for charging, let alone renewable energy generated on site. As the facility is a net consumer of electricity (to operate support equipment), operation of the Project will increase GHG and criteria pollutant emissions to operate the BESS and when the batteries are charged with nonrenewable energy sources, which will occur whenever incremental[314] wind and solar are not available to meet incremental charging loads because they are already being fully used.

The DEIR fails to provide the key information required to estimate charging emissions, including the battery storage efficiency and expected energy output of the batteries. The storage capacity of the various BESS options, the amount of energy the batteries can store, is included in Table 3-18 of the DEIR. However, the expected energy output was not provided. This is the number of MWh of generation expected over the course of a typical year, which will be less than the storage capacity x 8,760 hours[315] due to hours when the Project will be either charging or not operating or generating at less than full capacity.

The storage efficiency (sometimes also called "round-trip efficiency") depends on the battery technology used and is relevant to the environmental impacts of the Project because lower efficiency means more grid generation required for each MWh of expected energy output. It is the ratio of energy output per MWh of charging energy (i.e., MWh of battery generation divided by MWh of battery charging energy).

All of this information is required to estimate emissions from Project operation. The DEIR fails as an informational document under CEQA for failing to calculate emissions from BESS battery charging and for failing to include the information required to calculate these emissions.

Because the DEIR does not provide any data on the expected efficiency, capacity factor, or its expected charging energy requirements or energy generation, we used CAISO data for existing energy storage projects. Specifically, we looked at four 2-week periods in each of the four annual seasons (fall 2020, winter 2020–21, spring 2020, and summer 2020).[316] Our analysis is summarized in Exhibits 2A and 2B.[317]

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[314] "Incremental" is analogous to marginal. Incremental wind and solar means solar and wind in addition to what is already generating; incremental charging loads means charging loads in addition to whatever charging loads, if any, are already happening. Marginal can refer to small changes either up or down from the status quo ante, while incremental refers to upward changes only ("decremental" refers to small downward changes).

[315] 8,760 is the number of hours in a year.

[316] See the attached spreadsheet of CAISO storage data, Exhibit 2B.

The CAISO provides data at 5-minute intervals for the net MW of storage generation (positive numbers) or charging (negative numbers). We downloaded the 5-minute data for 56 days over the last year, selected to represent two weeks in each of the four seasons of the year.[318] The use of two full weeks of data for each season accounts for day-of-the-week variation and also for multi-day responses to weather, where generation on one day may reflect charging on the previous day.[319] The use of data from each of the seasons of the year accounts for seasonal variation in insolation and loads.

We aggregated the CAISO 5-minute data by day, by season, and for the full year represented by the data.[320] From the aggregated data, we calculated an overall annual capacity (220 MW), generation capacity factor (4.1%), efficiency (71.2%), and charging energy (131,424 MWh, or 131.4 gigawatt hours (GWh)).[321] Assuming the proposed Project storage components will have the same efficiency and capacity factor as the CAISO storage in operation in 2020–2021, the corresponding expected charging energy requirements for the Project will be 0.5048 GWh per year per project MW.[322] The net increase in energy generation, after taking account of hours when the Project would be discharging, will be 0.1454 GWh per year per Project MW.[323]

The CAISO does not provide any data on the marginal sources of supply for storage charging on its system. Nor does it provide any data on marginal sources of supply for individual time periods, which could be cross-matched with the 5-minute storage charging data to calculate the marginal sources of charging energy. The DEIR also provides no information on the sources of charging energy, other than to suggest that some unspecified fraction will come from renewable energy resources.[324] That fraction is likely quite low because only a small fraction of solar generation (and virtually no non-solar renewable generation) is curtailed generation that could have

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[317] Emission calculations by David Marcus. Calculations based on Otay Mesa Emissions in Exhibit 2A and CAISO storage data in Exhibits 2B; Marcus resume in Exhibit 3.

[318] See Exhibit 2A, Storage Data Spreadsheet, Columns I to KJ. The two-week periods were the most recent available data for the winter season (January 13-26, 2021) and the periods exactly 3 months earlier for each preceding season.

[319] See, e.g., Exhibit 2A, Storage Data Spreadsheet, lines 12, 14, 26, 27, 33, 35, 42, 49 and 65-66), where daily generation exceeded charging. This is only possible if some of the generation relied upon charging in the prior day(s).

[320] See Exhibit 2A, Storage Data Spreadsheet, columns C–G.

[321] See Exhibit 2A, Storage Data Spreadsheet, lines 80-81.

[322] See Exhibit 2A, Storage Data Spreadsheet, line 83, column D.

[323] See Exhibit 2A, Storage Data Spreadsheet, line 86, column D.

[324] DEIR, p. 4.3-28, pdf 446.

been used for battery charging.[325] Thus, the DEIR fails as an informational document under CEQA.

The CAISO grid covers most of California, and because of the Western Energy Imbalance Market,[326] marginal sources of generation outside the CAISO are also available from a wide swath of the Western U.S. grid. Thus, the CAISO's marginal source of generation is likely to be gas-fired generation in the great majority of hours. Therefore, we assumed that the most reasonable approximation to the expected emissions associated with battery charging is the emissions from a modern natural gas-fired combined cycle plant. Such plants are the most efficient gas-fired plants, and gas is the cleanest fossil fuel with the lowest emissions.

Thus, for any hour in which gas (or coal) is the marginal fuel, the emissions from a gas-fired combined cycle plant are a lower-bound emissions estimate. There will be a small number of hours in which solar or wind are the marginal resources, as shown by their being curtailed in the absence of battery charging to absorb their generation. In those hours, assuming a combined cycle plant as the marginal resource will overstate the emissions associated with battery charging. That overstatement is offset by the hours in which the marginal source is a combustion turbine or steam plant, whose emissions are greater than those of a combined cycle plant.

The Project would interconnect to the CAISO-controlled grid. A typical modern combined cycle gas plant connected to CAISO-controlled transmission lines is the Otay Mesa project, which began operation in October 2009. California Energy Commission (CEC) data for five recent years show that the average Otay Mesa heat rate over the 2014–2018 period was 7,183 Btu/kWh.[327] Based on that heat rate, and EIA data on emissions from Otay Mesa for the years 2013–2017,[328] we have calculated emission factors for Otay Mesa of 420 tons of CO_2 per GWh, 3.33 pounds of SO_2 per GWh, and just under 30 pounds of NOx per GWh.[329]

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[325] In 2018, only 1.4% of solar generation and 0.2% of wind generation were curtailed, and no other renewable generation. The corresponding figures for 2019 are 3.1% for solar and 0.3% for wind. The 2020 figures are 4.9% for solar and 0.5% for wind. Source: David Marcus, personal communication, based on tracking of CAISO data for hourly curtailments and daily wind and solar generation. Exhibit 2C.

[326] The Western Energy Imbalance Market is a real-time, wholesale energy trading market that enables participants anywhere in the West to buy and sell energy when needed. See https://www.westerneim.com/pages/default.aspx.

[327] See Exhibit 2B, Otay Mesa Data Spreadsheet, bottom left.

[328] The 5 years of available data (2013–2017) are from https://www.eia.gov/electricity/data/emissions/. Otay Mesa is plant #55345 in the EIA database.

[329] Exhibit 2B, Otay Mesa Data Spreadsheet, bottom left, Excel cells C33-C35.

Assuming 0.145 GWh per year per MW of net charging energy for the Project, as discussed above, and further assuming emission rates for that energy equivalent to those for the Otay Mesa combined cycle project, the net emission increases that would occur to operate the Project are, for each MW of installed capacity:[330]

- 60.93 tons of CO2e per year
- 0.48 pounds of SO2 per year
- 4.30 pounds of NOx per year

The proposed Project as submitted to the CPUC included provisions for three new distribution circuits with a total load-serving capacity of approximately 28 MW. While the DEIR admits that there will be no need for these circuits through at least 2029, based on the current Paso Robles DPA load forecast,[331] it also says that PG&E anticipates needing new distribution capacity within 15 years. Assuming that there would eventually be 28 MW of new storage built in lieu of the proposed new distribution circuits from the Estrella substation, and assuming that storage would operate comparably to existing storage during the great majority of hours when it was not being dispatched to meet local reliability needs, the total incremental GHG emissions attributable to the Project would be 28 times the annual emissions of 60.93 tons of CO_2e per MW calculated above, or **1,552 MT CO_2e/yr**.[332]

Similarly, the NOx emissions attributable to the Project would be 28 times the annual emissions of 4.30 lb/yr calculated above, or **120.4 lb/yr**. The NOx emissions are not significant, based on charging energy from a new natural gas plant. However, if other sources of charging energy, such as an older natural gas plant or a coal plant provided the charging energy, NOx emissions also would be significant.

6.3. GHG Emissions from BESS Charging Are Significant

The DEIR estimated total annualized GHG emissions of 187 MT CO_2e/yr[333] compared to a significance threshold of 10,000 MT/yr[334] and concluded Project GHG

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[330] Exhibit 2B, Otay Mesa Data Spreadsheet, bottom left, Excel cells C40-C42. Note that these emissions are based on net emissions of 0.145 GWh per year per MW, which is the net of the increased generation to provide charging energy and the reduced generation that would be displaced by battery generation. See Exhibit 2A. Storage Data Spreadsheet, lines 83 and 86.

[331] DEIR, p. 2-12, Table 2-5.

[332] Total GHG emissions from operating the BESSs = (60.93 ton/yr/MW)*28 MW*(0.91 MT/ton) = **1,552 MT CO_2e/yr.**

[333] DEIR, Table 4.8-1, pdf 607.

[334] DEIR, p. 607.

emissions are not significant.[335] However, this threshold is for "stationary-source projects" that "would require an APCD permit to operate."[336] This project will not require an APCD permit to operate. Thus, this threshold does not apply. The GHG threshold for "land use development projects" is 1,150 MTCO_2e/yr.[337] Similarly, the BAAQMD's CEQA guidelines establish a GHG significance threshold for projects other than stationary sources that do not require a district permit of 1,100 MT MTCO_2e/yr.[338] The Sacramento Metropolitan Air Quality Management District (SMAQMD) likewise has established a threshold of 1,100 MT CO_2e/yr threshold for "land development and construction projects (all projects)."[339] These GHG significance thresholds are more appropriate for this Project than the 10,000 ton/yr thresholds for stationary sources used in the DEIR.

The total GHG emissions, based on the DEIR's estimate of other sources of GHG in Table 4.8-1 (187 MT CO_2e/yr) is 1,739 MT CO_2e/yr.[340] Actual GHG emissions could be significantly higher as this estimate is based on a new natural gas plant that has much lower emissions than many other sources on the grid that could charge the batteries. Thus, Project GHG emissions are significant (1,739 MT CO_2e/yr > 1,100 MT CO_2e/yr). This is a new significant impact not disclosed in the DEIR. The DEIR must be modified to include GHG mitigation and recirculated for public review.

This significant impact can be mitigated by requiring that the Project's batteries be charged only with renewable sources, including solar and wind. If it is anticipated that adequate solar and wind are not available from the grid, the Project should be required to install solar and/or wind facilities as part of this Project, sufficient to assure adequate charging energy.

6.4. Mitigation for Operational Emissions

The Project should be modified to require no net increase in GHG emissions over the baseline by implementing projects to reduce GHG emissions as follows:

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[335] DEIR, Table 4.8-1 and p. 4.8-7, pdf 607.

[336] SLOCAPCD CEQA Guidelines, p. 3-6.

[337] Ibid.

[338] BAAQMD, California Environmental Quality Act Air Quality Guidelines, Table 2-1, pdf 20; https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en.

[339] SMAQMD, Thresholds of Significance Table; https://files.ceqanet.opr.ca.gov/123569-2/attachment/UL9obk_yjl5aUBxUrjyQ9P3HVyfSLoCEnhvRpgSHGIQmRUgvfjw0ZXCcdqPM73lOOUtFc8Rl7yI_48800.

[340] Total GHG emissions = 187 + 1,552 **= 1,739 CO_2e/yr.**

(1) Project design features/on-site reduction measures;
(2) GHG offsets off-site within San Luis Obispo County;
(3) GHG offsets off-site within the State of California;
(4) GHG offsets off-site within the United States;
(5) GHG offsets off-site internationally;
(6) Charging restrictions that constrain battery charging to hours when CAISO renewable resources would otherwise be curtailed, but the curtailment would be demonstrably avoided by using otherwise curtailed generation as battery-charging energy, or if such demonstrations are not feasible; and
(7) Charging restrictions that constrain battery charging to hours when solar generation is potentially being curtailed, which would at a minimum mean no charging during nighttime hours.

7. THE DEIR FAILS TO MITIGATE THE IMPACTS OF THE TRANSMISSION LINE

The Project includes a new 230 kilovolt (kV)/70 kV substation, a new 70 kV power line, variously reported as 7 to 16.5 miles in length[341] and replacement/ reconductoring of about 3 miles of an existing 70 kV power line.[342] The purpose of the Project is to mitigate thermal overloads and voltage concerns in the Los Padres 70 kV system. The DEIR states that the Project is needed to provide transmission system redundancy and power support in the event of outages, as well as increased distribution capacity to accommodate forecasted electrical load growth in the Paso Robles area.[343] These new facilities, especially the transmission line, will result in several significant impacts, including increased fire risk, public health impacts, aesthetic impacts, and biological impacts that are either not disclosed and/or not adequately mitigated in the DEIR.

The most common scoping comments were on aesthetic impacts, electromagnetic field hazards, fire hazards, noise impacts, and decreased property values due to the overhead transmission line.[344] In fact, the screening report admits that "[o]ne of the

[341] DEIR, Table 5-3, pdf 921.

[342] DEIR, p. ES-1, pdf 25.

[343] DEIR, p. ES-1, pdf 25.

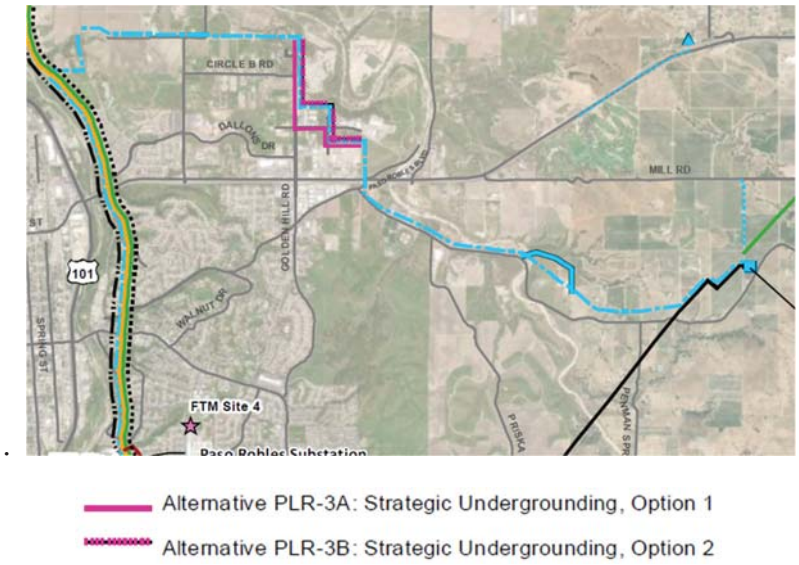
[344] DEIR, Appendix A, Table 2-2, p. 2-4, pdf 30.

most common generalized comments received was that the proposed overhead power lines should be placed underground."[345]

In spite of these comments, the DEIR failed to adopt undergrounding of any portion of the transmission line. While the DEIR developed two undergrounding alternatives, the DEIR failed to evaluate or adopt them, thus failing as an informational document under CEQA.

The DEIR included two alternatives to the aboveground transmission line, Alternative PLR-3A and PLR-3B to underground small portions of it, as shown in Figure 16. However, the DEIR failed to adopt either or explain why they were not adopted as they reduce otherwise highly significant aesthetic, public health, and biological impacts in the area as well as the risk of fire.

Figure 16: Segments of Transmission Line (in blue)
Proposed for Undergrounding (in pink)



The alternative screening analysis in Appendix A to DEIR indicates that both alternatives PLR-3A and PLR-3B meet all project objectives, are feasible, and reduce significant environmental impacts:[346]

Alternative PLR-3: Strategic Undergrounding (*Variations: Alternative PLR-3A and PLR-3B*)	Meets both objectives.	Potentially feasible. Could increase some environmental effects associated with trenching for installation of underground line, but these are unlikely to be significant.	Would reduce aesthetic impacts and could reduce potential impacts to special-status birds.

However, the alternative analysis in the DEIR, Table 5-1, concluded that Alternative Combination #2 "is considered the most advantageous option and is

[345] DEIR, Appendix A, p. 2-5, pdf 31.

[346] DEIR, Appendix A, Table 3-1, p. 3-2, pdf 38 and pp. 3-28/29.

identified as the Environmentally Superior Alternative for this DEIR."[347] This alternative (the Estrella Route) includes Alternative PLR-1A, Alternative BS-2, and Alternative BS-3.[348] It does not include any undergrounding, thus leaving unmitigated significant aesthetic, biology, and public health impacts from above-ground transmission line electromagnetic fields. While this alternative reduces significant aesthetic and biology impacts, it does not eliminate them. Further, it does not mitigate the significant EMF health impacts along the length of the transmission line.

The DEIR further failed to disclose many of the impacts of the aboveground transmission line and failed to adequately mitigate the impacts that it did disclose, fire, aesthetic, and biological impacts. As discussed in Comment 7.2, the entire transmission line should be undergrounded.

7.1. Impacts of the Transmission Line

There are numerous hazards associated with the proposed aboveground transmission line. The DEIR recognized some of them: aesthetic, biological, and fire impacts. These were superficially analyzed and not adequately mitigated. Further, there are other impacts that were not disclosed, including worker accidents,[349] health impacts from electromagnetic radiation, and power outages from high winds, which are common in areas such as the Project and that affect critical services such as hospitals. Thus, the DEIR fails as an informational document under CEQA.

7.1.1. Fire Risks of the Transmission Line

The DEIR admits that the "[o]peration of an electrified substation and new overhead 70 kV power lines in the Paso Robles area would inherently exacerbate the potential for wildfire risk above baseline conditions…"[350] Further, a significant portion of the transmission line is adjacent to a high fire hazard zone.[351] Wildfires are common

[347] DEIR, Section 5.3.2, pdf 917- 918.

[348] DEIR, Table 5-2, pdf 918.

[349] Exhibit 14.

[350] DEIR, pdf 893.

[351] DEIR, Figure 4.9-2; PEA, pdf 435, Figure 3.8-1.

in San Luis Obispo County.[352] In 2020 alone, 16 major fires burned 14,008 acres of land.[353]

Portions of the power line route and reconductoring segment will traverse areas of oak woodlands, grassland, and other flammable habitat types.[354] The DEIR further admits that "[o]peration of an electrified substation and new overhead 70 kV power lines in the Paso Robles area would inherently exacerbate the potential for wildfire risk above baseline conditions."[355] Recently, the U.S. Forest Service completely closed several California national forests due to extreme heat and threat of wildfires, including Los Padres National Forest,[356] close to the Project.

However, despite these conditions, the DEIR asserts that the maintenance of acceptable clearances between the power lines and nearby vegetation would minimize the risk of energized lines igniting wildfires and concludes the impact is less than significant.[357] This is inconsistent with fire history and presents a significant risk of fire in the area serviced by the Project.

The DEIR fails to disclose that recent history shows wildfires triggered by electrical infrastructure have the potential to cause horrible catastrophes and are frequently caused by transmission lines, such as the proposed transmission line.[358] Further, the DEIR fails to disclose that Pacific Gas and Electric (PG&E), one of the applicants of this Project, has experienced significantly more fire incidents than other large utilities in California.[359]

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[352] CAL FIRE/San Luis Obispo County Fire, July 2013; https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Projects/SLO-Watershed-Project/Resources/CAL-FIRE-Unit-Strategic-Fire-Plan.pdf.

[353] Cal Fire, 2020 Incident Archive. The fires were: Wale (312 acres), Placer (53 acres), 3-2 (20 acres), Carriza (183 acres), Pass (280 acres) 166 Fire; Pond (1,962 acres), Branch (3,022), Lake (588 acres), Soda (157 acres), Gage (33 acres), Bend (263 acres), Riata (18 acres), Avila (445 acres), Soda (1,672 acres), Range (5,000 acres). https://www.fire.ca.gov/incidents/2020/.

[354] DEIR, p. 4.20-10, pdf 892.

[355] DEIR, p. 4.20-11, pdf 893.

[356] Lindsey Holden, "Unprecedented and Dangerous" Fire Conditions Close Los Padres National Forest in SLO County, September 7, 2020; https://www.sanluisobispo.com/news/local/article245548775.html.

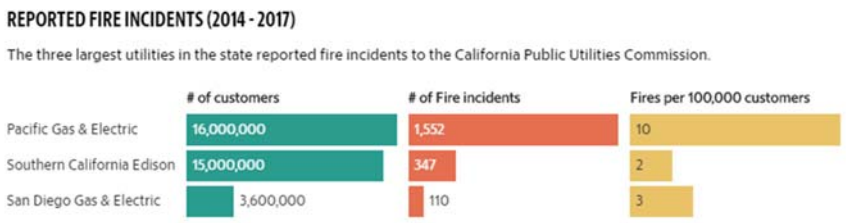
[357] Ibid.

[358] See, e.g., William Atkinson, The Link Between Power Lines and Wildfires, *Electrical Contractor*, November 2018; https://www.ecmag.com/section/systems/link-between-power-lines-and-wildfires.

[359] Michael Finch II, CA Utilities Cause Hundreds of Fires Every Year: Here's Where They Were and How Many, *The Sacramento Bee*, January 15, 2019; https://www.sacbee.com/news/state/california/fires/article221924560.html.

Most power outages are triggered by fires. Strong winds can topple trees or blow branches onto power lines, pulling them down and causing them to arc, sending sparks into dry vegetation. A voltage surge in a line can cause it to arc to a nearby tree, causing a fire. PG&E, for example, reported 1,554 fires caused by its equipment between June 10, 2014, and December 29, 2017, mostly from overhead conductors. Southern California Edison reported 347 fires in that same time. Electrical line malfunctions sparked most of the PG&E fires.[360] Figure 17.

Figure 17: Reported Fire Incidents Triggered by Electrical Line Malfunctions, 2014–2017



The PG&E Fire Incident Data Collection Plan indicates that between June 2014 and December 2017, 1,552 fires were caused by PG&E's electrical infrastructure, affecting 16 million customers.[361] PG&E reported in 2021 that over the last four years, "approximately 35 percent of reportable ignitions in PG&E's HFTD areas have been caused by vegetation contact with electrical equipment and another 33 percent were caused by utility equipment failures; the remaining ignitions were caused by third-party actions, animals, and other causes."[362] The wildfires caused by PG&E's infrastructure have the potential to cause horrible catastrophes and are frequently caused by transmission lines, such as the transmission line proposed for the Project.[363] PG&E will operate the transmission line and other Project components.[364]

A report by the California Department of Forestry and Fire Protection (CalFire), for example, concluded that numerous PG&E-caused fires started when trees and branches came into contact with power lines. One such fire, the Redwood Fire, burned

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[360] Taryn Luna, California Utility Equipment Sparked More Than 2,000 Fires in Over Three Years, *Los Angeles Times*, January 28, 2019; https://www.latimes.com/politics/la-pol-ca-california-utilities-wildfires-regulators-20190128-story.html.

[361] Finch, January 15, 2019.

[362] PG&E, 2021 Wildfire Mitigation Plan Report, Rulemaking 18-10-007, February 5, 2021, p. 11, pdf 34; https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/2021-Wildfire-Safety-Plan.pdf.

[363] See, e.g., William Atkinson, The Link Between Power Lines and Wildfires, *Electrical Contractor*, November 2018; https://www.ecmag.com/section/systems/link-between-power-lines-and-wildfires.

[364] DEIR, Section 2.3, pdf 98.

over 36,000 acres, destroyed 543 structures, and resulted in 9 civilian deaths. Another, the Atlas Fire, burned 52,000 acres, destroyed 781 structures, and resulted in 6 civilian deaths.[365] During the summer of 2018, the Department reported at least 17 more major wildfires that were triggered by power lines. One of these, the Thomas Fire, burned 281,893 acres, destroyed 1,063 buildings[366] and caused a mudslide that killed 22 people.

Five of the 10 most destructive fires in California since 2015 have been linked to PG&E's electrical network.[367] One of the biggest fires started near Sacramento in 2015, when a tree that PG&E failed to maintain hit one of its power lines. The fire covered more than 70,000 acres and two people died. In 2017, four fires erupted in the Napa area when trees hit PG&E power lines in several locations. In total, more than 100,000 acres and 1,475 structures burned.[368] A PG&E transmission line has recently been implicated in the Camp Fire as the "deadliest and most destructive fire in California history." This fire killed 85 people, destroyed 18,804 structures and burned 153,336 acres.[369] CalFire has determined that the Camp Fire was caused by electrical transmission lines owned and operated by PG&E, located in the Pulga area.[370] In response to this tragedy, PG&E has announced that it will rebuild the transmission lines underground.[371]

Many other fires have been caused by PG&E transmission lines and other facilities. The Pythian/Oakmont Fire destroyed 56,556 acres of mixed wildland and 1,272 structures were damaged. "The fire ignited after PG&E re-energized downed powerlines causing the lines to arc in a receptive fuel bed."[372] The Atlas fire burned 51,624 acres, damaged 783 structures, destroyed 120 structures, and caused 6 fatalities.

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[365] CalFire, Top 20 Deadliest California Wildfires; http://calfire.ca.gov/communications/downloads/fact_sheets/Top20_Deadliest.pdf.

[366] CalFire, Top 20 Deadliest California Wildfires.

[367] CalFire, Top 20 Deadliest California Wildfires.

[368] https://www.nytimes.com/interactive/2019/03/18/business/pge-california-wildfires.html?te=1&nl=california-today&emc=edit_ca_20190516.

[369] CalFire, Top 20 Deadliest California Wildfires.

[370] CalFire News Release, CAL FIRE Investigators Determine Cause of the Camp Fire, May 15, 2019; http://calfire.ca.gov/communications/downloads/newsreleases/2019/CampFire_Cause.pdf. See also: Butte County District Attorney, Press Release, CAL Fire Press Release on Camp Fire, May 15, 2019. Exhibit 12.

[371] Dale Kasler, PG&E Says It Will Build Paradise Power Lines Underground, *The Sacramento Bee*, May 22, 2019; https://amp.sacbee.com/latest-news/article230732884.html.

[372] Cal Fire, Investigation Report, Pythian/Oakmont, October 13, 2017; http://s1.q4cdn.com/880135780/files/doc_downloads/2019/06/17CALNU010348-Pythian-Oakmont_Redacted_Redacted.pdf.

It was caused when trees fell, breaking conductors.[373] Other fires caused by PG&E transmission lines are documented in CAL Fire Reports.[374]

PG&E, the largest investor-owned utility in the state, supplying power for 40% of Californians, filed for bankruptcy protection due to these fires.[375] As PG&E is currently burdened with responding to this fire history and will likely be responsible for maintaining the new transmission line and other Project facilities, enforceable mitigation for the Project is required to assure proper maintenance of an aboveground transmission line. A bankrupt utility, such as PG&E, already burdened with correcting historic maintenance failures may be unable to adequately carry out its obligations to mitigate its historic misconduct and adequately maintain the proposed aboveground transmission line and other Project facilities.

In response to this history of fire, the California Legislature passed SB 901 in 2018 to hold utilities responsible for wildfires. SB901 requires utilities to consider several safety measures, including moving power lines underground, insulating wires, and replacing poles. The CPUC recently concluded that the 2019 Wildfire Mitigation Plan filed by Pacific Gas and Electric Company and other utilities contain the elements required under Senate Bill 901.[376] To ensure that the Wildfire Mitigation Plans actually reduce the risk and occurrence of catastrophic wildfires, the CPUC directed electrical corporations to track data and assess outcomes so that future plans reflect experience. However, in spite of these measures, the fires continue.

PG&E's Wildfire Mitigation Plans for 2020,[377] 2021,[378] and future Plans have been developed to comply with California SB 901, AB 1054, and direction from the CPUC outline programs to prevent catastrophic wildfires. The 2020 and 2021 Plans, which

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[373] Cal Fire, Investigation Report, Atlas, October 8, 2017; http://s1.q4cdn.com/880135780/files/doc_downloads/2019/05/Atlas-Fire-LE-80_Redacted.pdf

[374] PG&E Corporation, CAL FIRE Reports, http://investor.pgecorp.com/wildfire-updates/CAL-FIRE-Reports/.

[375] Wildfires and Climate Change: California's Energy Future: A Report from Governor Newsom's Strike Force, April 12, 2019, p. 1, 45-46; https://www.gov.ca.gov/wp-content/uploads/2019/04/Wildfires-and-Climate-Change-California%E2%80%99s-Energy-Future.pdf.

[376] California Public Utilities Commission, CPUC Acts Quickly to Implement Key Wildfire Mitigation Measures, Press Release, https://electricenergyonline.com/article/energy/category/general/90/771184/cpuc-acts-quickly-to-implement-key-wildfire-mitigation-measures.html.

[377] PG&E, 2020 Wildfire Mitigation Plan Report Updated, Rulemaking 18-10-007, February 28, 2020; https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/2020-Wildfire-Safety-Plan.pdf.

[378] PG&E, 2021 Wildfire Mitigation Plan Report, Rulemaking 18-10-007, February 5, 2021; https://www.pge.com/en_US/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan.page?WT.mc_id=Vanity_wildfiremitigationplan.

may reduce the number of wildfires triggered by PG&E facilities, will not eliminate them.[379] The most current Plan should be required as mitigation for this Project and updated as new Plans are published reflecting experience controlling wildfires caused by PG&E's facilities. Undergrounding is one of the mitigations included in these plans.[380]

7.1.2. Worker Impacts

The DEIR fails to recognize worker health impacts of the transmission line. Working with aboveground electrical power lines can be dangerous or even fatal. Aboveground transmission lines are prone to outages, physical deterioration, lack of critical maintenance, and dangers from storms and trees, which result in electrocution and mortality to transmission line workers and others:[381]

> The National Institute for Occupational Safety and Health's (NIOSH) National Traumatic Occupational Fatalities (NTOF) surveillance system identified power line workers as a high-risk occupation group for work-related deaths. According to NTOF data, the average annual fatality rate for power line workers is 56.3 deaths per 100,000 employees.(2) The Bureau of Labor Statistics' (BLS) Census of Fatal Occupational Injuries (CFOI) identified 42 fatalities among electric power installers and repairers in 1993 (38 deaths per 100,000 workers). (3) These rates correspond to a risk of between 17 and 23 deaths per thousand workers over a working lifetime of 45 years. The risk may actually be higher, however, because available data do not provide specific numbers for construction workers.

Electrical powerline installers and repairers are among the top 10 most dangerous jobs in America,[382,383] with a 19.2 fatality rate per 100,000 workers.[384] The leading cause of death among power line tree trimmers, for example, is electrocution.[385] NIOSH reports 160 electrocution cases involving workers in the vicinity of or working on transmission lines.[386] The U.S. Bureau of Labor Statistics reports: "Line installers and

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[379] Ibid., Table 31-2.

[380] PG&E, 2021, pdf 130.

[381] NIOSH, Fatality Assessment and Control Evaluation (FACE) Program; https://wwwn.cdc.gov/NIOSH-FACE/Default.cshtml?Category=0006&Category2=ALL&Submit=Submit.

[382] David Shadle, Electrical Workers Still on Top 10 Most Dangerous Jobs List, T&D World eNewsletters, April 11, 2016; https://www.tdworld.com/grid-innovations/article/20966311/electrical-workers-still-on-top-10-most-dangerous-jobs-list.

[383]Bailey, Javins, and Carter, LC, What is the Death Rate for Power Linemen?, Bailey Javins & Carter, July 22, 2019; https://www.baileyjavinscarter.com/what-is-the-death-rate-for-power-linemen/.

[384] Krysti Shallenberger, Electric Line Workers Listed Among Top 10 Most Dangerous Jobs.

[385] Jeffrey Feldman, Why Aren't Power Lines Buried in the U.S. Like They are in Europe?, August 25, 2016; https://www.electrocuted.com/2016/08/25/bury-power-lines-underground-to-prevent-electrocution-deaths/.

[386] NIOSH, Fatality Assessment and Control Evaluation (FACE) Program; https://www.cdc.gov/niosh/face/default.html.

repairers face dangerous working conditions. In severe cases, these conditions could lead to fatal injuries."[387] Table 6.

Table 6: Number of Fatal Work Injuries and Nonfatal Occupational Injuries and Illnesses Involving Days Away from Work, 2011–2015[388]

Occupation	Fatal injuries					Nonfatal injuries and illnesses				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Line installers and repairers	38	37	42	44	40	5,540	5,000	6,640	6,260	6,250
Electrical power-line installers and repairers	26	27	27	25	26	2,500	2,090	2,310	2,510	2,240

Electrocutions accounted for 3% of fatal occupational injuries overall but caused nearly one-half of the fatal injuries to electrical power-line installers and repairers. The Bureau of Labor Statistics concluded that "[t]he increasing use of underground utility lines and the waning popularity of landlines may ultimately reduce the number of falls."[389] The DEIR fails to disclose the impact of repairing the aboveground transmission line on worker health.

7.1.3. Electric and Magnetic Field Impacts

Overhead transmission lines are a source of two fields: the electric field produced by the voltage and the magnetic field produced by the current. CPUC guidance specifically requires that "[t]he construction of a new transmission line will incorporate no-cost and low-cost magnetic field reduction measures. Magnetic field modeling is required."[390] The DEIR failed to discuss these fields and their impacts on sensitive receptors even though the proposed transmission line is within 50 feet of many homes.[391] It also fails to comply with the CPUC design guidelines.

Contrary to allegations in the PEA,[392] significant public health impacts have been consistently documented from exposure to electromagnetic fields, both extremely low-

[387] BLS, Monthly Labor Review, Workplace Hazards Facing Line Installers and Repairers, February 2018; https://www.bls.gov/opub/mlr/2018/article/pdf/workplace-hazards-facing-line-installers-and-repairers.pdf.

[388] Id., Table 1.

[389] Id., p. 11.

[390] California Public Utility Commission, EMF Design Guidelines for Electrical Facilities, Table 3-1, pdf 9, July 21, 2006; https://www.cpuc.ca.gov/General.aspx?id=4879.

[391] PEA, Appendix A.

[392] PEA, Appendix B. Electric and Magnetic Fields, pdf 23.

frequency ELF-EMF from sources like power lines and radiofrequency radiation (RFR) in refereed journal articles. These include short- and long-term health impacts:[393,394]

Short Term Health Impacts:

- Headaches
- Fatigue
- Anxiety
- Insomnia
- Prickling and/or burning skin
- Rashes
- Muscle Pain

Long Term Health Impacts:

- Impacts on gene and protein expression
- Genotoxic effects, including RFR[395] and ELF DNA damage
- Adverse impacts on stress proteins
- Adverse impacts on immune function
- Adverse impacts on neurology and behavior
- Brain tumors and acoustic neuromas
- Childhood cancers (leukemia)
- Adult cancers (breast cancer promotion)
- Adverse impacts on melatonin leading to Alzheimer's disease and breast cancer
- Changes in nervous system and brain function
- Impacts on DNA
- Impacts on stress proteins
- Impacts on the immune system
- Risk of leukemia
- Risk of neurodegenerative disease
- Risk of miscarriage

These significant public health impacts can be mitigated by undergrounding the transmission line and by adopting the recommendations in CPUC Design Guidelines.[396]

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[393] Cindy Sage and David O. Carpenter (Editors), BioInitiative Report: A Rationale for Biologically Based Exposure Standards for Low-Intensity Electromagnetic Radiation, BioInitiative Working Group, December 31, 2012, Exhibit13.

[394] Jiguparmar, How HV Transmission Lines Affects Humans and Plants; https://electrical-engineering-portal.com/how-hv-transmission-lines-affects-humans-plants.

[395] RFR = radiofrequency radiation; ELF = (extremely low frequency).

At a minimum, Alternative PLR-3, strategic undergrounding, should be adopted, as this segment of the transmission line passes through the Golden Hill Road area north of SR 46, which has the greatest potential for public health, aesthetic, biological, and other environmental impacts. Figure 16.

Undergrounding will not eliminate electric and magnetic fields, but will minimize their impacts.[397] The California PUC, for example, has concluded that "Because underground conductors are insulated, they may be placed within inches of each other. This means that there generally can be greater magnetic field cancellation in an underground circuit than an overhead circuit."[398]

7.2. The Transmission Line Should Be Undergrounded

The adverse impacts of the transmission line can be completely eliminated (fire, aesthetic, biology) or minimized (public health) by undergrounding it. PG&E, for example, recently announced that it will underground 200 miles of the power lines that caused the Camp Fire.[399] Undergrounding is in progress.[400] PG&E is also currently undergrounding power lines through the CPUC's Rule 20A[401] program.[402] Further, there are many other benefits to undergrounding the transmission line.[403,404,405]

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[396] California Public Utility Commission, EMF Design Guidelines for Electrical Facilities, July 21, 2006; https://www.cpuc.ca.gov/General.aspx?id=4879.

[397] See discussion of the impact of undergrounding transmission lines on electric and magnetic fields in: Undergrounding High Voltage Electricity Transmission Lines, Section 9: Electric and Magnetic Fields (EMFs) from Underground Cables, p. 18; https://www.nationalgrid.com/sites/default/files/documents/45349-Undergrounding_high_voltage_electricity_transmission_lines_The_technical_issues_INT.pdf.

[398] California Public Utility Commission, EMF Design Guidelines for Electrical Facilities, July 21, 2006, p. 5, pdf 7, Section 2.2

[399] Dale Kasler, PG&E Say It Will Build Paradise Power Lines Underground, *The Sacramento Bee*, May 22, 2019; https://amp.sacbee.com/latest-news/article230732884.html#referrer=https%3A%2F%2Fwww.google.com&amp_tf=From%20%251%24s.

[400] Kristian Lopez, PG&E Continues Moving Power Lines Underground in Paradise, *Action News Now*, November 5, 2020; https://www.actionnewsnow.com/content/news/PGE-continues-moving-powerlines-underground-in-Paradise-572976261.html.

[401] CPUC Underground Programs: Conversion of Overhead Electric Lines to Underground Facilities and Construction of New Underground Electric Lines; https://www.cpuc.ca.gov/General.aspx?id=4403.

[402] Deanna Contreras, PG&E Undergrounding Power Lines in Santa Rosa, PG&E Currents, July 27, 2020; http://www.pgecurrents.com/2020/07/27/pge-undergrounding-power-lines-in-santa-rosa/.

[403] Vince Curci, Underground Transmission Technical Lead, Blog, Top 5 Reasons to Use Underground Transmission Lines, February 19, 2018; https://www.hdrinc.com/insights/top-5-reasons-use-underground-transmission-lines.

[404] RETA, Burying High Voltage Lines; https://retasite.wordpress.com/burying-high-voltage-lines/.

As noted in a recent article, "Why aren't power lines in the U.S. buried underground like they are in some places in Europe?":[406]

> When utility power lines are above ground, they're prone to outages, physical deterioration and lack of critical maintenance, and dangers from storms and trees. These are what kill most people in electrocution lawsuits. These are the reasons that most power lines fall and kill an unsuspecting homeowner, child or utility worker.
>
> Although we regularly see outages and dangerous power lines that can kill innocent people here in America, we don't see anyone being electrocuted and killed in European countries such as Germany. Why? In Germany, the risk of outages or power-line dangers is greatly reduced, because the power lines are underground, according to an article on Outside the Beltway, "Why can't we just bury all the power lines?"

Most European countries[407] (e.g., UK, Belgium, Germany, Italy, Netherlands,[408] Finland[409]) routinely bury low-voltage transmission lines, such as the Project's 70-kV line, except for those near massive power plants and isolated homes in far-off places. Even in the United States, aboveground power lines are often absent in affluent neighborhoods and major cities, such as Manhattan, Washington DC, San Diego, and Tarzana, a suburb south of Los Angeles. PG&E's most recent Wildfire Mitigation Plan Report notes as follows:[410]

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[405] Leonardo Energy, What are the Main Benefits of Underground Cables, March 28, 2019; https://help.leonardo-energy.org/hc/en-us/articles/202706932-What-are-the-main-benefits-of-underground-cables-.

[406] Jeffrey Feldman, Why Aren't Power Lines Buried in the U.S. Like They Are in Europe?, August 25, 2016; https://www.electrocuted.com/2016/08/25/bury-power-lines-underground-to-prevent-electrocution-deaths/.

[407] Commission of the European Communities, Undergrounding of Electricity Lines in Europe, Background Paper, Tables 1-3, December 10, 2003; https://www.stjornarradid.is/library/01--Frettatengt--myndir-og-skrar/ANR/ANR---Raflinur-i-jord/1-Commission.pdf.

[408] Robert Tarimo, Going Underground: European Transmission Practices, PowerGrid International, October 1, 2011; https://www.power-grid.com/td/going-underground-european-transmission-practices/#gref.

[409] Replacing Overhead Lines with Underground Cables in Finland; https://climate-adapt.eea.europa.eu/metadata/case-studies/replacing-overhead-lines-with-underground-cables-in-finland.

[410] PG&E, 2021, pdf 568, Section 7.3.3.16 Undergrounding of Electric Lines and/or Equipment.

> Undergrounding electric lines and facilities can significantly reduce wildfire risk by eliminating overhead lines which may be prone to wires down events or otherwise prone to potential wildfire ignitions. The installation of underground facilities is considered among a suite of alternatives to mitigate wildfire risk in areas prone to tree failures. PG&E also considers secondary risks such as PSPS impacts, egress/ingress routes to support fire department response times and public safety, past fire history and effects on available fuels, current system condition, environmental risks to reconstruction activities, and general accessibility considerations to enhance employee safety when determining whether specific facilities should be undergrounded.

PG&E has concluded that: "underground construction presents the most reliable method for mitigating the need for PSPS [public safety power shutoff] operations. There will be occasions that undergrounding is chosen even when it does not present the best Risk Spend Efficiency (RSE) of the hardening options because it is the most reasonable alternative to mitigate all risks considered."[411] A 1967 PUC case concluded as to undergrounding:[412]

> The record shows that California electric and communications utilities began installing their facilities underground during the latter part of the 19th century. Undergrounding proceeded at a leisurely pace until about five years ago. Since then, due to a combination of accelerated public interest and technical developments which substantially reduced the cost of undergrounding, a large percentage of new residential developments have been supplied from underground distribution systems. The record indicates that respondent utilities have followed acceptable standards of care based upon past experience and are continuing to improve methods of construction, including joint construction with other utilities, to better serve the public and reduce costs. The evidence further discloses that the present underground electrical and communications systems cannot be considered hazardous and the safety record is good.

The usual argument for declining to bury power lines is cost. However, when assessing the cost of burying power lines, cost must be weighed against the clear benefits. There will be far fewer electrical injuries and electrocution deaths, fewer bird deaths, fewer power outages, and fewer obstructed views from below-grade transmission lines. A price cannot be put on worker injuries and death, bird deaths,

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[411] PG&E, 2021, pdf 574.

[412] CPUC, Rules for Construction of Underground Electric Supply and Communication Systems, General Order Number 128, Rules for Construction of Underground Electric Supply and Communication Systems, Decision No. 73195 and 73462, Case No. 8208, Adopted October 17, 1967; https://docs.cpuc.ca.gov/PUBLISHED/GENERAL_ORDER/52591.htm.

and obstructed views. There are many compelling reasons to underground the transmission line.

First, visual impacts typically top the list of long-term impacts that cannot be mitigated.[413] The DEIR evaluated 23 key visual observation points (KOPs) and concluded that the observation points where the transmission line was visible had moderate to high visual impacts.[414] The DEIR proposed an alternative to undergrounding the portion of the transmission line where visual impacts were most significant, PLR-3, but declined to adopt it.[415]

PUC Section 320, established in 1972, requires both electric and telecommunications utilities to construct all new distribution facilities underground that are proposed to be erected within 1,000 feet from each edge of the right-of-way of designated State Scenic Highways pursuant to Article 2.5 of Chapter 2 of Division 1 of the Streets and Highways Code and which would be visible from such scenic highways if erected above ground.[416,417] Segments of the proposed transmission line are within 1,000 feet of SR 46, which meets these criteria. However, this highway section has not been formally listed, so the DEIR ignored this requirement and erroneously concluded aesthetic impacts in this area were not significant.[418]

Second, undergrounding eliminates electrocution and collision hazards for people, rodents, squirrels, and birds, and eliminates fire risk from arcing lines during windy conditions.[419] High winds, locally known as Santa Lucia winds, are common at the Project site.

Third, underground transmission lines are more reliable as they are not impacted by atmospheric conditions (e.g., high winds, ice storms, and lightning) that may result

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[413] Curci, February 19, 2018: "While aesthetic impact isn't the only transmission line concern, it tops the list of long-term impacts that can't be mitigated."

[414] DEIR, Table 4.1-1, pdf 367-374. (KOP-1 to KOP-6, KOP-10, KOP-16 to KOP-19).

[415] DEIR, Chapter 5.

[416] PUC Code, Division 1, Chapter 2, Section 320; https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=320.&lawCode=PUC.

[417] CPUC, Electric Tariff Rules 15 and 16 – Electric Distribution Line Extensions and Service Line Extensions; https://www.cpuc.ca.gov/General.aspx?id=6442465113. See also Section IX; https://www.cpuc.ca.gov/General.aspx?id=4403.

[418] DEIR, Figure 4.1-1, pdf 349 and pdf 384.

[419] See, e.g., Vince Curci, Top 5 Reasons to Use Underground Transmission Lines, February 19, 2018; https://www.hdrinc.com/insights/top-5-reasons-use-underground-transmission-lines; and Peter H. Larsen, A Method to Estimate the Costs and Benefits of Undergrounding Electricity Transmission and Distribution Lines, *Energy Economics*, vol. 60, November 2016, p. 47–61, https://www.sciencedirect.com/science/article/pii/S0140988316302493.

in outages or cause wildfires. High winds are common in the Project area. Underground lines are also more reliable due to reduced exposure to outages caused by trees during adverse weather and other conditions. The average outage duration on an underground line is typically more than 90% lower than on overhead lines.

Fourth, underground transmission lines provide better voltage support, have lower transmission losses, and can absorb emergency power loads.

Fifth, undergrounding reduces operating costs by: (1) reducing tree trimming costs; (2) reducing the number of maintenance repairs; (3) reducing maintenance time, by maintaining the system at ground level, rather than from poles and bucket trucks; (4) reducing maintenance cost because underground lines are not subject to tornadoes and other high wind storms, ice storms, general weather deterioration, birds colliding with lines and knocking out the power, and so forth; (5) reducing costs of transmission loss and feeder energy losses; (6) avoiding power outage costs due to less frequent outages; (7) reducing the thousands of outages of aboveground facilities caused every year by animals (mainly squirrels); (8) avoiding ecosystem-related restoration costs; and (9) reducing transmission loss (electricity to heat) costs by 50% to 67%. Recent experience indicates that transmission lines can be buried for almost the same capital cost as overhead lines.[420] In addition, exposure of overhead lines to weather conditions causes them to corrode and age faster than underground lines.[421]

Sixth, undergrounding eliminates the risk from human activities, such as vandalism and terrorism, and minimizes the risk from natural disasters, including earthquakes, landslides, and floods, thus improving system reliability.[422]

Seventh, underground transmission lines are inherently safe because cables are insulated, electrically shielded, and out of the way. Underground lines are not affected by fires and do not cause fires. They also decrease the need to shut down the line during a wildfire.

Eighth, underground lines do not lower adjacent property values.

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[420] RETA, Burying High Voltage Lines: Benefits of Underground Lines; https://retasite.wordpress.com/burying-high-voltage-lines/

[421] Victor Glass, PG&E Case Study: Burying Lines to Prevent Wildfires is Cost Effective, T&D World, April 1, 2020; https://www.tdworld.com/wildfire/article/21127664/pge-case-study-burying-lines-to-prevent-wildfires-is-cost-effective.

[422] Kenneth L. Hall, Out of Sight, Out of Mind 2012: An Updated Study on the Undergrounding of Overhead Power Lines, Prepared for: Edison Electric Institute, January 2013; https://www.eei.org/issuesandpolicy/electricreliability/undergrounding/Documents/UndergroundReport.pdf.

Ninth, undergrounding reduces the area required around the line by about a factor of three, reducing construction impacts, biological impacts, and GHG emissions by reducing permanently disturbed surface vegetation.[423]

Tenth, undergrounding reduces concerns regarding the use of fire retardants on overhead transmission lines.

Undergrounding is clearly feasible and cost effective because California currently has 72,000 miles of underground distribution lines as well as a program to encourage undergrounding[424] (e.g., PUC Rule 20[425]). San Diego Gas & Electric reports that 60% of its distribution lines are now underground, including rural lines running through areas that are prone to wildfires, like the Project location.[426] Plans are underway to convert 20 miles of overhead wires to underground in a high fire-risk area around Cuyamaca Rancho State Park and the town of Campo and SDG&E is exploring dozens of other areas for potential future undergrounding for fire safety reasons.[427] PG&E is evaluating undergrounding its line along the Bohemian Highway in Sonoma County, where thousands live among densely wooded hillsides. Utilities now often underground power lines in newer urban developments[428] and elsewhere to avoid permitting delays and environmental impacts. Direct Connect Development Company (DC DevCo) has proposed a 349-mile, 2.1 GH, high-voltage direct current transmission line to bring renewable energy from the wind-rich West (starting in Mason City, Iowa) into wholesale power markets of the Upper Midwest to avoid permitting delays.[429]

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[423] Siemens, Power Transmission Lines: Forward-looking Solutions for Electricity Transmission; https://new.siemens.com/global/en/products/energy/high-voltage/power-transmission-lines.html.

[424] CPUC, Overhead to Underground Conversion Programs, p. 9; https://www.cpuc.ca.gov/General.aspx?id=4403.

[425] See, e.g., PG&E, Electric Undergrounding Program; https://www.pge.com/mybusiness/customerservice/energystatus/streetconstruction/rule20/index.shtml.

[426] Atkinson, The Link Between Power Lines and Wildfires, November 2018. See also PUC, Rulemaking 17-05-010, February 13, 2020, Figure 1, pdf 16; https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M327/K199/327199859.PDF.

[427] J. Harry Jones, Power Lines and Poles to be Replaced in National Forest, *The San Diego Union-Tribune*, September 28, 2016; https://www.sandiegouniontribune.com/communities/north-county/sd-no-forest-power-20160927-story.html.

[428] Tony Bizjak, Sophia Bollag, and Dale Kasler, Power Lines Keep Sparking Wildfires: Why Don't California Utility Companies Bury Them, November 29, 2018, *The Sacramento Bee*; https://www.sacbee.com/news/business/article221707650.html.

[429] Michelle Froese, Proposed New Transmission Project Would Deliver Renewables Between PJM & MISO, WindPower, March 11, 2019; https://www.windpowerengineering.com/business-news-projects/uncategorized/proposed-new-transmission-project-would-deliver-renewables-between-pjm-miso/; Julia Gheorghiu, Independent Developer Proposes $2.5B Underground Transmission Line, to Bring Iowa Wind to PJM, MISO, *Utility Dive*, March 13, 2019; https://www.utilitydive.com/news/

In sum, undergrounding the entire transmission line is feasible and should be required. The DEIR lacks any substantial evidence that undergrounding of the transmission line is not feasible. Rather, as discussed above, undergrounding mitigates significant Project impacts including public health, biological, and aesthetic.

However, undergrounding in the selected location would increase significant public health impacts identified in Comment 2.8. These significant impacts can be mitigated by relocating the transmission line and/or implementing mitigation identified in Comment 2.8. If the transmission line is not relocated, it should be undergrounded to mitigate significant electromagnetic public health, biology, and aesthetic impacts. The significant public health and air quality impacts identified in Comment 2.8.1 to 2.8.3 during construction can be mitigated by using the mitigation measures in Comment 2.8.3 and extending construction duration to minimize the amount of equipment operating in a given area simultaneously.

independent-developer-proposes-25b-underground-transmission-line-adding/550399/. See also: https://www.desmoinesregister.com/story/money/business/2019/03/11/underground-transmission-line-would-take-wind-power-iowa-chicago/3128357002/ and https://www.chicagotribune.com/business/ct-biz-iowa-wind-power-to-chicago-20190312-story.html.

Phyllis Fox, Ph.D, PE
Environmental Management
[redacted]

Dr. Fox has over 40 years of experience in the field of environmental engineering, including air pollution control (BACT, BART, MACT, LAER, RACT), greenhouse gas emissions and control, cost effectiveness analyses, water quality and water supply investigations, hydrology, hazardous waste investigations, environmental permitting, nuisance investigations (odor, noise), environmental impact reports, CEQA/NEPA documentation, risk assessments, and litigation support.

EDUCATION

Ph.D. Environmental/Civil Engineering, University of California, Berkeley, 1980.
M.S. Environmental/Civil Engineering, University of California, Berkeley, 1975.
B.S. Physics (with high honors), University of Florida, Gainesville, 1971.

REGISTRATION

Registered Professional Engineer: Arizona (2001-2014: #36701; retired), California (2002-present; CH 6058), Florida (2001-2016; #57886; retired), Georgia (2002-2014; #PE027643; retired), Washington (2002-2014; #38692; retired), Wisconsin (2005-2014; #37595-006; retired)
Board Certified Environmental Engineer, American Academy of Environmental Engineers, Certified in Air Pollution Control (DEE #01-20014), 2002-2014; retired)
Qualified Environmental Professional (QEP), Institute of Professional Environmental Practice (QEP #02-010007, 2001-2015: retired).

PROFESSIONAL HISTORY

Environmental Management, Principal, 1981-present
Lawrence Berkeley National Laboratory, Principal Investigator, 1977-1981
University of California, Berkeley, Program Manager, 1976-1977
Bechtel, Inc., Engineer, 1971-1976, 1964-1966

PROFESSIONAL AFFILIATIONS

American Chemical Society (1981-2010)
Phi Beta Kappa (1970-present)
Sigma Pi Sigma (1970-present)
Who's Who Environmental Registry, PH Publishing, Fort Collins, CO, 1992.
Who's Who in the World, Marquis Who's Who, Inc., Chicago, IL, 11th Ed., p. 371, 1993-present.

Who's Who of American Women, Marquis Who's Who, Inc., Chicago, IL, 13th Ed., p. 264, 1984-present.
Who's Who in Science and Engineering, Marquis Who's Who, Inc., New Providence, NJ, 5th Ed., p. 414, 1999-present.
Who's Who in America, Marquis Who's Who, Inc., 59th Ed., 2005.
Guide to Specialists on Toxic Substances, World Environment Center, New York, NY, p. 80, 1980.
National Research Council Committee on Irrigation-Induced Water Quality Problems (Selenium), Subcommittee on Quality Control/Quality Assurance (1985-1990).
National Research Council Committee on Surface Mining and Reclamation, Subcommittee on Oil Shale (1978-80)

REPRESENTATIVE EXPERIENCE

Performed environmental and engineering investigations, as outlined below, for a wide range of industrial and commercial facilities including: petroleum refineries and upgrades thereto; reformulated fuels projects; refinery upgrades to process heavy sour crudes, including tar sands and light sweet crudes from the Eagle Ford and Bakken Formations; petroleum, gasoline and ethanol distribution terminals; coal, coke, and ore/mineral export terminals; LNG export, import, and storage terminals; crude-by-rail projects; shale oil plants; crude oil/condensate marine and rail terminals; coal gasification and liquefaction plants; oil and gas production, including conventional, thermally enhanced, hydraulic fracking, and acid stimulation techniques; underground storage tanks; pipelines; compressor stations; gasoline stations; landfills; railyards; hazardous waste treatment facilities; nuclear, hydroelectric, geothermal, wood, biomass, waste, tire-derived fuel, gas, oil, coke and coal-fired power plants; wind farms; solar energy facilities; battery storage facilities; transmission lines; airports; hydrogen plants; petroleum coke calcining plants; coke plants; activated carbon manufacturing facilities; asphalt plants; cement plants; incinerators; flares; manufacturing facilities (e.g., semiconductors, electronic assembly, aerospace components, printed circuit boards, amusement park rides); lanthanide processing plants; ammonia plants; nitric acid plants; urea plants; food processing plants; wineries; almond hulling facilities; composting facilities; grain processing facilities; grain elevators; ethanol production facilities; soy bean oil extraction plants; biodiesel plants; paint formulation plants; wastewater treatment plants; marine terminals and ports; gas processing plants; steel mills; iron nugget production facilities; pig iron plant, based on blast furnace technology; direct reduced iron plant; acid regeneration facilities; railcar refinishing facility; battery manufacturing plants; pesticide manufacturing and repackaging facilities; pulp and paper mills; olefin plants; methanol plants; ethylene crackers; alumina plants, desalination plants; battery storage facilities; data centers; covered lagoon anaerobic digesters with biogas generators and upgrading equipment to produce renewable natural gas and electricity; selective catalytic reduction (SCR) systems; selective noncatalytic reduction (SNCR) systems; halogen acid furnaces; contaminated property

redevelopment projects (e.g., Mission Bay, Southern Pacific Railyards, Moscone Center expansion, San Diego Padres Ballpark); residential developments; commercial office parks, campuses, and shopping centers; server farms; transportation plans; and a wide range of mines including sand and gravel, hard rock, limestone, nacholite, coal, molybdenum, gold, zinc, and oil shale.

EXPERT WITNESS/LITIGATION SUPPORT

- For plaintiffs-intervenors (Sierra Club), in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications at Rush Island Units 1 and 2 and Labadie Energy Center, assist counsel in evaluating best available control technology (BACT) to reduce SO2 emissions, including wet and dry scrubbing, sorbent injection, and offsets. Case settled. *U.S. and Sierra Club vs. Ameren Missouri*, Case No. 4-11 CV 77 RWS, U.S. District Court, Eastern District of Missouri, Eastern Division, September 30, 2019.
- For the California Attorney General, assist in determining compliance with probation terms in the matter of People v. Chevron USA.
- For plaintiffs, assist in developing Petitioners' proof brief for National Parks Conservation Association et al v. U.S. EPA, Petition for Review of Final Administrative Action of the U.S. EPA, In the U.S. Court of Appeals for the Third Circuit, Docket No. 14-3147.
- For plaintiffs, expert witness in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1997-2000) at the Cemex cement plant in Lyons, Colorado. Reviewed produced documents, prepared expert and rebuttal reports on PSD applicability based on NOx emission calculations for a collection of changes considered both individually and collectively. Deposed August 2011. *United States v. Cemex, Inc.*, In U.S. District Court for the District of Colorado (Civil Action No. 09-cv-00019-MSK-MEH). Case settled June 13, 2013.
- For plaintiffs, in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1988 – 2000) at James De Young Units 3, 4, and 5. Reviewed produced documents, analyzed CEMS and EIA data, and prepared netting and BACT analyses for NOx, SO2, and PM10 (PSD case). Expert report February 24, 2010 and affidavit February 20, 2010. *Sierra Club v. City of Holland, et al.*, U.S. District Court, Western District of Michigan (Civil Action 1:08-cv-1183). Case settled. Consent Decree 1/19/14.
- For plaintiffs, in civil action alleging failure to obtain MACT permit, expert on potential to emit hydrogen chloride (HCl) from a new coal-fired boiler. Reviewed record, estimated HCl emissions, wrote expert report June 2010 and March 2013 (Cost to Install a Scrubber at the Lamar Repowering Project Pursuant to Case-by-Case MACT), deposed August 2010 and

March 2013. *Wildearth Guardian et al. v. Lamar Utilities Board,* Civil Action No. 09-cv-02974, U.S. District Court, District of Colorado. Case settled August 2013.

- For plaintiffs, expert witness on permitting, emission calculations, and wastewater treatment for coal-to-gasoline plant. Reviewed produced documents. Assisted in preparation of comments on draft minor source permit. Wrote two affidavits on key issues in case. Presented direct and rebuttal testimony 10/27 - 10/28/10 on permit enforceability and failure to properly calculate potential to emit, including underestimate of flaring emissions and omission of VOC and CO emissions from wastewater treatment, cooling tower, tank roof landings, and malfunctions. *Sierra Club, Ohio Valley Environmental Coalition, Coal River Mountain Watch, West Virginia Highlands Conservancy v. John Benedict, Director, Division of Air Quality, West Virginia Department of Environmental Protection and TransGas Development System, LLC*, Appeal No. 10-01-AQB. Virginia Air Quality Board remanded the permit on March 28, 2011 ordering reconsideration of potential to emit calculations, including: (1) support for assumed flare efficiency; (2) inclusion of startup, shutdown and malfunction emissions; and (3) inclusion of wastewater treatment emissions in potential to emit calculations.
- For plaintiffs, expert on BACT emission limits for gas-fired combined cycle power plant. Prepared declaration in support of CBE's Opposition to the United States' Motion for Entry of Proposed Amended Consent Decree. Assisted in settlement discussions. *U.S. EPA, Plaintiff, Communities for a Better Environment, Intervenor Plaintiff, v. Pacific Gas & Electric Company, et al.*, U.S. District Court, Northern District of California, San Francisco Division, Case No. C-09-4503 SI.
- Technical expert in confidential settlement discussions with large coal-fired utility on BACT control technology and emission limits for NOx, SO2, PM, PM2.5, and CO for new natural gas fired combined cycle and simple cycle turbines with oil backup. (July 2010). Case settled.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1998-99) at Gallagher Units 1 and 3. Reviewed produced documents, prepared expert and rebuttal reports on historic and current-day BACT for SO2, control costs, and excess emissions of SO2. Deposed 11/18/09. *United States et al. v. Cinergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Settled 12/22/09.
- For plaintiffs, expert witness on MACT, BACT for NOx, and enforceability in an administrative appeal of draft state air permit issued for four 300-MW pet-coke-fired CFBs. Reviewed produced documents and prepared prefiled testimony. Deposed 10/8/09 and 11/9/09. Testified 11/10/09. *Application of Las Brisas Energy Center, LLC for State Air Quality Permit*; before the State Office of Administrative Hearings, Texas. Permit remanded 3/29/10 as LBEC failed to meet burden of proof on a number of issues including MACT.

Texas Court of Appeals dismissed an appeal to reinstate the permit. The Texas Commission on Environmental Quality and Las Brisas Energy Center, LLC sought to overturn the Court of Appeals decision but moved to have their appeal dismissed in August 2013.

- For defense, expert witness in unlawful detainer case involving a gasoline station, minimart, and residential property with contamination from leaking underground storage tanks. Reviewed agency files and inspected site. Presented expert testimony on July 6, 2009, on causes of, nature and extent of subsurface contamination. *A. Singh v. S. Assaedi,* in Contra Costa County Superior Court, CA. Settled August 2009.
- For plaintiffs, expert witness on netting and enforceability for refinery being upgraded to process tar sands crude. Reviewed produced documents. Prepared expert and rebuttal reports addressing use of emission factors for baseline, omitted sources including coker, flares, tank landings and cleaning, and enforceability. Deposed. *In the Matter of Objection to the Issuance of Significant Source Modification Permit No. 089-25484-00453 to BP Products North America Inc., Whiting Business Unit, Save the Dunes Council, Inc., Sierra Club., Inc., Hoosier Environmental Council et al., Petitioners, B. P. Products North American, Respondents/Permittee,* before the Indiana Office of Environmental Adjudication. Case settled.
- For plaintiffs, expert witness on BACT, MACT, and enforceability in appeal of Title V permit issued to 600 MW coal-fired power plant burning Powder River Basin coal. Prepared technical comments on draft air permit. Reviewed record on appeal, drafted BACT, MACT, and enforceability pre-filed testimony. Drafted MACT and enforceability pre-filed rebuttal testimony. Deposed March 24, 2009. Testified June 10, 2009. *In Re: Southwestern Electric Power Company*, Arkansas Pollution Control and Ecology Commission, Consolidated Docket No. 08-006-P. Recommended Decision issued December 9, 2009 upholding issued permit. Commission adopted Recommended Decision January 22, 2010.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1989-1992) at Wabash Units 2, 3 and 5. Reviewed produced documents, prepared expert and rebuttal report on historic and current-day BACT for NOx and SO2, control costs, and excess emissions of NOx, SO2, and mercury. Deposed 10/21/08. *United States et al. v. Cinergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Testified 2/3/09. Memorandum Opinion & Order 5-29-09 requiring shutdown of Wabash River Units 2, 3, 5 by September 30, 2009, run at baseline until shutdown, and permanently surrender SO2 emission allowances.
- For plaintiffs, expert witness in liability phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for three historic modifications (1997-2001) at two portland cement plants involving three cement kilns. Reviewed produced documents, analyzed CEMS data covering subject period, prepared netting analysis for NOx, SO_2 and CO, and prepared expert and rebuttal reports. *United States v. Cemex California*

Cement, In U.S. District Court for the Central District of California, Eastern Division, Case No. ED CV 07-00223-GW (JCRx). Settled 1/15/09.

- For intervenors Clean Wisconsin and Citizens Utility Board, prepared data requests, reviewed discovery and expert report. Prepared prefiled direct, rebuttal and surrebuttal testimony on cost to extend life of existing Oak Creek Units 5-8 and cost to address future regulatory requirements to determine whether to control or shutdown one or more of the units. Oral testimony 2/5/08. Application for a Certificate of Authority to Install Wet Flue Gas Desulfurization and Selective Catalytic Reduction Facilities and Associated Equipment for Control of Sulfur Dioxide and Nitrogen Oxide Emissions at Oak Creek Power Plant Units 5, 6, 7 and 8, WPSC Docket No. 6630-CE-299.
- For plaintiffs, expert witness on alternatives analysis and BACT for NOx, SO2, total PM10, and sulfuric acid mist in appeal of PSD permit issued to 1200 MW coal fired power plant burning Powder River Basin and/or Central Appalachian coal (Longleaf). Assisted in drafting technical comments on NOx on draft permit. Prepared expert disclosure. Presented 8+ days of direct and rebuttal expert testimony. Attended all 21 days of evidentiary hearing from 9/5/07 – 10/30/07 assisting in all aspects of hearing. *Friends of the Chatahooche and Sierra Club v. Dr. Carol Couch, Director, Environmental Protection Division of Natural Resources Department, Respondent, and Longleaf Energy Associates, Intervener*. ALJ Final Decision 1/11/08 denying petition. ALJ Order vacated & remanded for further proceedings, Fulton County Superior Court, 6/30/08. Court of Appeals of GA remanded the case with directions that the ALJ's final decision be vacated to consider the evidence under the correct standard of review, July 9, 2009. The ALJ issued an opinion April 2, 2010 in favor of the applicant. Final permit issued April 2010.
- For plaintiffs, expert witness on diesel exhaust in inverse condemnation case in which Port expanded maritime operations into residential neighborhoods, subjecting plaintiffs to noise, light, and diesel fumes. Measured real-time diesel particulate concentrations from marine vessels and tug boats on plaintiffs' property. Reviewed documents, depositions, DVDs, and photographs provided by counsel. Deposed. Testified October 24, 2006. *Ann Chargin, Richard Hackett, Carolyn Hackett, et al. v. Stockton Port District*, Superior Court of California, County of San Joaquin, Stockton Branch, No. CV021015. Judge ruled for plaintiffs.
- For plaintiffs, expert witness on NOx emissions and BACT in case alleging failure to obtain necessary permits and install controls on gas-fired combined-cycle turbines. Prepared and reviewed (applicant analyses) of NOx emissions, BACT analyses (water injection, SCR, ultra low NOx burners), and cost-effectiveness analyses based on site visit, plant operating records, stack tests, CEMS data, and turbine and catalyst vendor design information. Participated in negotiations to scope out consent order. *United States v. Nevada Power.* Case settled June 2007, resulting in installation of dry low NOx burners (5 ppm NOx averaged over 1 hr) on four units and a separate solar array at a local business.

- For plaintiffs, expert witness in appeal of PSD permit issued to 850 MW coal fired boiler burning Powder River Basin coal (Iatan Unit 2) on BACT for particulate matter, sulfuric acid mist and opacity and emission calculations for alleged historic violations of PSD. Assisted in drafting technical comments, petition for review, discovery requests, and responses to discovery requests. Reviewed produced documents. Prepared expert report on BACT for particulate matter. Assisted with expert depositions. Deposed February 7, 8, 27, and 28, 2007. *In Re PSD Construction Permit Issued to Great Plains Energy, Kansas City Power & Light – Iatan Generating Station, Sierra Club v. Missouri Department of Natural Resources, Great Plains Energy, and Kansas City Power & Light.* Case settled March 27, 2007, providing offsets for over 6 million ton/yr of CO2 and lower NOx and SO_2 emission limits.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications of coal-fired boilers and associated equipment. Reviewed produced documents, prepared expert report on cost to retrofit 24 coal-fired power plants with scrubbers designed to remove 99% of the sulfur dioxide from flue gases. Prepared supplemental and expert report on cost estimates and BACT for SO2 for these 24 complaint units. Deposed 1/30/07 and 3/14/07. *United States and State of New York et al. v. American Electric Power*, In U.S. District Court for the Southern District of Ohio, Eastern Division, Consolidated Civil Action Nos. C2-99-1182 and C2-99-1250. Settlement announced 10/9/07.
- For plaintiffs, expert witness on BACT, enforceability, and alternatives analysis in appeal of PSD permit issued for a 270-MW pulverized coal fired boiler burning Powder River Basin coal (City Utilities Springfield Unit 2). Reviewed permitting file and assisted counsel draft petition and prepare and respond to interrogatories and document requests. Reviewed interrogatory responses and produced documents. Assisted with expert depositions. Deposed August 2005. Evidentiary hearings October 2005. *In the Matter of Linda Chipperfield and Sierra Club v. Missouri Department of Natural Resources.* Missouri Supreme Court denied review of adverse lower court rulings August 2007.
- For plaintiffs, expert witness in civil action relating to plume touchdowns at AEP's Gavin coal-fired power plant. Assisted counsel draft interrogatories and document requests. Reviewed responses to interrogatories and produced documents. Prepared expert report "Releases of Sulfuric Acid Mist from the Gavin Power Station." The report evaluates sulfuric acid mist releases to determine if AEP complied with the requirements of CERCLA Section 103(a) and EPCRA Section 304. This report also discusses the formation, chemistry, release characteristics, and abatement of sulfuric acid mist in support of the claim that these releases present an imminent and substantial endangerment to public health under Section 7002(a)(1)(B) of the Resource Conservation and Recovery Act ("RCRA"). *Citizens Against Pollution v. Ohio Power Company*, In the U.S. District Court for the Southern District of Ohio, Eastern Division, Civil Action No. 2-04-cv-371. Case settled 12-8-06.

- For petitioners, expert witness in contested case hearing on BACT, enforceability, and emission estimates for an air permit issued to a 500-MW supercritical Power River Basin coal-fired boiler (Weston Unit 4). Assisted counsel prepare comments on draft air permit and respond to and draft discovery. Reviewed produced file, deposed (7/05), and prepared expert report on BACT and enforceability. Evidentiary hearings September 2005. *In the Matter of an Air Pollution Control Construction Permit Issued to Wisconsin Public Service Corporation for the Construction and Operation of a 500 MW Pulverized Coal-fired Power Plant Known as Weston Unit 4 in Marathon County, Wisconsin*, Case No. IH-04-21. The Final Order, issued 2/10/06, lowered the NOx BACT limit from 0.07 lb/MMBtu to 0.06 lb/MMBtu based on a 30-day average, added a BACT SO2 control efficiency, and required a 0.0005% high efficiency drift eliminator as BACT for the cooling tower. The modified permit, including these provisions, was issued 3/28/07. Additional appeals in progress.
- For plaintiffs, adviser on technical issues related to Citizen Suit against U.S. EPA regarding failure to update New Source Performance Standards for petroleum refineries, 40 CFR 60, Subparts J, VV, and GGG. *Our Children's Earth Foundation and Sierra Club v. U.S. EPA et al.* Case settled July 2005. CD No. C 05-00094 CW, U.S. District Court, Northern District of California – Oakland Division. Proposed revisions to standards of performance for petroleum refineries published 72 FR 27178 (5/14/07).
- For interveners, reviewed proposed Consent Decree settling Clean Air Act violations due to historic modifications of boilers and associated equipment at two coal-fired power plants. In response to stay order, reviewed the record, selected one representative activity at each of seven generating units, and analyzed to identify CAA violations. Identified NSPS and NSR violations for NOx, SO_2, PM/PM10, and sulfuric acid mist. Summarized results in an expert report. *United States of America, and Michael A. Cox, Attorney General of the State of Michigan, ex rel. Michigan Department of Environmental Quality, Plaintiffs, and Clean Wisconsin, Sierra Club, and Citizens' Utility Board, Intervenors, v. Wisconsin Electric Power Company, Defendant*, U.S. District Court for the Eastern District of Wisconsin, Civil Action No. 2:03-CV-00371-CNC. Order issued 10-1-07 denying petition.
- For a coalition of Nevada labor organizations (ACE), reviewed preliminary determination to issue a Class I Air Quality Operating Permit to Construct and supporting files for a 250-MW pulverized coal-fired boiler (Newmont). Prepared about 100 pages of technical analyses and comments on BACT, MACT, emission calculations, and enforceability. Assisted counsel draft petition and reply brief appealing PSD permit to U.S. EPA Environmental Appeals Board (EAB). Order denying review issued 12/21/05. *In re Newmont Nevada Energy Investment, LLC, TS Power Plant*, PSD Appeal No. 05-04 (EAB 2005).
- For petitioners and plaintiffs, reviewed and prepared comments on air quality and hazardous waste based on negative declaration for refinery ultra low sulfur diesel project located in SCAQMD. Reviewed responses to comments and prepared responses. Prepared declaration and presented oral testimony before SCAQMD Hearing Board on exempt sources (cooling towers) and calculation of potential to emit under NSR. Petition for writ of mandate filed

March 2005. Case remanded by Court of Appeals to trial court to direct SCAQMD to re-evaluate the potential environmental significance of NOx emissions resulting from the project in accordance with court's opinion. California Court of Appeals, Second Appellate Division, on December 18, 2007, affirmed in part (as to baseline) and denied in part. *Communities for a Better Environment v. South Coast Air Quality Management District and ConocoPhillips and Carlos Valdez et al v. South Coast Air Quality Management District and ConocoPhillips.* Certified for partial publication 1/16/08. Appellate Court opinion upheld by CA Supreme Court 3/15/10. *(2010) 48 Cal.4th 310*.

- For amici seeking to amend a proposed Consent Decree to settle alleged NSR violations at Chevron refineries, reviewed proposed settlement, related files, subject modifications, and emission calculations. Prepared declaration on emission reductions, identification of NSR and NSPS violations, and BACT/LAER for FCCUs, heaters and boilers, flares, and sulfur recovery plants. *U.S. et al. v. Chevron U.S.A.*, Northern District of California, Case No. C 03-04650. Memorandum and Order Entering Consent Decree issued June 2005. Case No. C 03-4650 CRB.
- For petitioners, prepared declaration on enforceability of periodic monitoring requirements, in response to EPA's revised interpretation of 40 CFR 70.6(c)(1). This revision limited additional monitoring required in Title V permits. 69 FR 3203 (Jan. 22, 2004). *Environmental Integrity Project et al. v. EPA* (U.S. Court of Appeals for the District of Columbia). Court ruled the Act requires all Title V permits to contain monitoring requirements to assure compliance. *Sierra Club v. EPA*, 536 F.3d 673 (D.C. Cir. 2008).
- For interveners in application for authority to construct a 500 MW supercritical coal-fired generating unit before the Wisconsin Public Service Commission, prepared pre-filed written direct and rebuttal testimony with oral cross examination and rebuttal on BACT and MACT (Weston 4). Prepared written comments on BACT, MACT, and enforceability on draft air permit for same facility.
- For property owners in Nevada, evaluated the environmental impacts of a 1,450-MW coal-fired power plant proposed in a rural area adjacent to the Black Rock Desert and Granite Range, including emission calculations, air quality modeling, comments on proposed use permit to collect preconstruction monitoring data, and coordination with agencies and other interested parties. Project cancelled.
- For environmental organizations, reviewed draft PSD permit for a 600-MW coal-fired power plant in West Virginia (Longview). Prepared comments on permit enforceability; coal washing; BACT for SO_2 and PM10; Hg MACT; and MACT for HCl, HF, non-Hg metallic HAPs, and enforceability. Assist plaintiffs draft petition appealing air permit. Retained as expert to develop testimony on MACT, BACT, offsets, enforceability. Participate in settlement discussions. Case settled July 2004.
- For petitioners, reviewed record produced in discovery and prepared affidavit on emissions of carbon monoxide and volatile organic compounds during startup of GE 7FA combustion

turbines to successfully establish plaintiff standing. *Sierra Club et al. v. Georgia Power Company* (Northern District of Georgia).

- For building trades, reviewed air quality permitting action for 1500-MW coal-fired power plant before the Kentucky Department for Environmental Protection (Thoroughbred).
- For petitioners, expert witness in administrative appeal of the PSD/Title V permit issued to a 1500-MW coal-fired power plant. Reviewed over 60,000 pages of produced documents, prepared discovery index, identified and assembled plaintiff exhibits. Deposed. Assisted counsel in drafting discovery requests, with over 30 depositions, witness cross examination, and brief drafting. Presented over 20 days of direct testimony, rebuttal and sur-rebuttal, with cross examination on BACT for NOx, SO_2, and PM/PM10; MACT for Hg and non-Hg metallic HAPs; emission estimates for purposes of Class I and II air modeling; risk assessment; and enforceability of permit limits. Evidentiary hearings from November 2003 to June 2004. *Sierra Club et al. v. Natural Resources & Environmental Protection Cabinet, Division of Air Quality and Thoroughbred Generating Company et al.* Hearing Officer Decision issued August 9, 2005 finding in favor of plaintiffs on counts as to risk, BACT (IGCC/CFB, NOx, SO_2, Hg, Be), single source, enforceability, and errors and omissions. Assist counsel draft exceptions. Cabinet Secretary issued Order April 11, 2006 denying Hearing Offer's report, except as to NOx BACT, Hg, 99% SO2 control and certain errors and omissions.
- For citizens group in Massachusetts, reviewed, commented on, and participated in permitting of pollution control retrofits of coal-fired power plant (Salem Harbor).
- Assisted citizens group and labor union challenge issuance of conditional use permit for a 317,000 ft^2 discount store in Honolulu without any environmental review. In support of a motion for preliminary injunction, prepared 7-page declaration addressing public health impacts of diesel exhaust from vehicles serving the Project. In preparation for trial, prepared 20-page preliminary expert report summarizing results of diesel exhaust and noise measurements at two big box retail stores in Honolulu, estimated diesel PM10 concentrations for Project using ISCST, prepared a cancer health risk assessment based on these analyses, and evaluated noise impacts.
- Assisted environmental organizations to challenge the DOE Finding of No Significant Impact (FONSI) for the Baja California Power and Sempra Energy Resources Cross-Border Transmissions Lines in the U.S. and four associated power plants located in Mexico (DOE EA-1391). Prepared 20-page declaration in support of motion for summary judgment addressing emissions, including CO_2 and NH_3, offsets, BACT, cumulative air quality impacts, alternative cooling systems, and water use and water quality impacts. Plaintiff's motion for summary judgment granted in part. U.S. District Court, Southern District decision concluded that the Environmental Assessment and FONSI violated NEPA and the APA due to their inadequate analysis of the potential controversy surrounding the project, water impacts, impacts from NH_3 and CO_2, alternatives, and cumulative impacts. *Border Power Plant Working Group v. Department of Energy and Bureau of Land Management*, Case No. 02-CV-513-lEG (POR) (May 2, 2003).

- For Sacramento school, reviewed draft air permit issued for diesel generator located across from playfield. Prepared comments on emission estimates, enforceability, BACT, and health impacts of diesel exhaust. Case settled. BUG trap installed on the diesel generator.
- Assisted unions in appeal of Title V permit issued by BAAQMD to carbon plant that manufactured coke. Reviewed District files, identified historic modifications that should have triggered PSD review, and prepared technical comments on Title V permit. Reviewed responses to comments and assisted counsel draft appeal to BAAQMD hearing board, opening brief, motion to strike, and rebuttal brief. Case settled.
- Assisted California Central Coast city obtain controls on a proposed new city that would straddle the Ventura-Los Angeles County boundary. Reviewed several environmental impact reports, prepared an air quality analysis, a diesel exhaust health risk assessment, and detailed review comments. Governor intervened and State dedicated the land for conservation purposes April 2004.
- Assisted Central California city to obtain controls on large alluvial sand quarry and asphalt plant proposing a modernization. Prepared comments on Negative Declaration on air quality, public health, noise, and traffic. Evaluated process flow diagrams and engineering reports to determine whether proposed changes increased plant capacity or substantially modified plant operations. Prepared comments on application for categorical exemption from CEQA. Presented testimony to County Board of Supervisors. Developed controls to mitigate impacts. Assisted counsel draft Petition for Writ. Case settled June 2002. Substantial improvements in plant operations were obtained including cap on throughput, dust control measures, asphalt plant loadout enclosure, and restrictions on truck routes.
- Assisted oil companies on the California Central Coast in defending class action citizen's lawsuit alleging health effects due to emissions from gas processing plant and leaking underground storage tanks. Reviewed regulatory and other files and advised counsel on merits of case. Case settled November 2001.
- Assisted oil company on the California Central Coast in defending property damage claims arising out of a historic oil spill. Reviewed site investigation reports, pump tests, leachability studies, and health risk assessments, participated in design of additional site characterization studies to assess health impacts, and advised counsel on merits of case. Prepare health risk assessment.
- Assisted unions in appeal of Initial Study/Negative Declaration ("IS/ND") for an MTBE phaseout project at a Bay Area refinery. Reviewed IS/ND and supporting agency permitting files and prepared technical comments on air quality, groundwater, and public health impacts. Reviewed responses to comments and final IS/ND and ATC permits and assisted counsel to draft petitions and briefs appealing decision to Air District Hearing Board. Presented sworn direct and rebuttal testimony with cross examination on groundwater impacts of ethanol spills on hydrocarbon contamination at refinery. Hearing Board ruled 5 to 0 in favor of appellants, remanding ATC to district to prepare an EIR.

- Assisted Florida cities in challenging the use of diesel and proposed BACT determinations in prevention of significant deterioration (PSD) permits issued to two 510-MW simple cycle peaking electric generating facilities and one 1,080-MW simple cycle/combined cycle facility. Reviewed permit applications, draft permits, and FDEP engineering evaluations, assisted counsel in drafting petitions and responding to discovery. Participated in settlement discussions. Cases settled or applications withdrawn.
- Assisted large California city in federal lawsuit alleging peaker power plant was violating its federal permit. Reviewed permit file and applicant's engineering and cost feasibility study to reduce emissions through retrofit controls. Advised counsel on feasible and cost-effective NOx, SOx, and PM10 controls for several 1960s diesel-fired Pratt and Whitney peaker turbines. Case settled.
- Assisted coalition of Georgia environmental groups in evaluating BACT determinations and permit conditions in PSD permits issued to several large natural gas-fired simple cycle and combined-cycle power plants. Prepared technical comments on draft PSD permits on BACT, enforceability of limits, and toxic emissions. Reviewed responses to comments, advised counsel on merits of cases, participated in settlement discussions, presented oral and written testimony in adjudicatory hearings, and provided technical assistance as required. Cases settled or won at trial.
- Assisted construction unions in review of air quality permitting actions before the Indiana Department of Environmental Management ("IDEM") for several natural gas-fired simple cycle peaker and combined cycle power plants.
- Assisted coalition of towns and environmental groups in challenging air permits issued to 523 MW dual fuel (natural gas and distillate) combined-cycle power plant in Connecticut. Prepared technical comments on draft permits and 60 pages of written testimony addressing emission estimates, startup/shutdown issues, BACT/LAER analyses, and toxic air emissions. Presented testimony in adjudicatory administrative hearings before the Connecticut Department of Environmental Protection in June 2001 and December 2001.
- Assisted various coalitions of unions, citizens groups, cities, public agencies, and developers in licensing and permitting of over 110 coal, gas, oil, biomass, and pet coke-fired power plants generating over 75,000 MW of electricity. These included base-load, combined cycle, simple cycle, and peaker power plants in Alaska, Arizona, Arkansas, California, Colorado, Georgia, Florida, Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, Oklahoma, Oregon, Texas, West Virginia, Wisconsin, and elsewhere. Prepared analyses of and comments on applications for certification, preliminary and final staff assessments, and various air, water, wastewater, and solid waste permits issued by local agencies. Presented written and oral testimony before various administrative bodies on hazards of ammonia use and transportation, health effects of air emissions, contaminated property issues, BACT/LAER issues related to SCR and SCONOx, criteria and toxic pollutant emission estimates, MACT analyses, air quality modeling, water supply and water quality issues, and methods to reduce

water use, including dry cooling, parallel dry-wet cooling, hybrid cooling, and zero liquid discharge systems.

- Assisted unions, cities, and neighborhood associations in challenging an EIR issued for the proposed expansion of the Oakland Airport. Reviewed two draft EIRs and prepared a health risk assessment and extensive technical comments on air quality and public health impacts. The California Court of Appeals, First Appellate District, ruled in favor of appellants and plaintiffs, concluding that the EIR "2) erred in using outdated information in assessing the emission of toxic air contaminants (TACs) from jet aircraft; 3) failed to support its decision not to evaluate the health risks associated with the emission of TACs with meaningful analysis," thus accepting my technical arguments and requiring the Port to prepare a new EIR. See *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (August 30, 2001) 111 Cal.Rptr.2d 598.
- Assisted lessor of former gas station with leaking underground storage tanks and TCE contamination from adjacent property. Lessor held option to purchase, which was forfeited based on misrepresentation by remediation contractor as to nature and extent of contamination. Remediation contractor purchased property. Reviewed regulatory agency files and advised counsel on merits of case. Case not filed.
- Advised counsel on merits of several pending actions, including a Proposition 65 case involving groundwater contamination at an explosives manufacturing firm and two former gas stations with leaking underground storage tanks.
- Assisted defendant foundry in Oakland in a lawsuit brought by neighbors alleging property contamination, nuisance, trespass, smoke, and health effects from foundry operation. Inspected and sampled plaintiff's property. Advised counsel on merits of case. Case settled.
- Assisted business owner facing eminent domain eviction. Prepared technical comments on a negative declaration for soil contamination and public health risks from air emissions from a proposed redevelopment project in San Francisco in support of a CEQA lawsuit. Case settled.
- Assisted neighborhood association representing residents living downwind of a Berkeley asphalt plant in separate nuisance and CEQA lawsuits. Prepared technical comments on air quality, odor, and noise impacts, presented testimony at commission and council meetings, participated in community workshops, and participated in settlement discussions. Cases settled. Asphalt plant was upgraded to include air emission and noise controls, including vapor collection system at truck loading station, enclosures for noisy equipment, and improved housekeeping.
- Assisted a Fortune 500 residential home builder in claims alleging health effects from faulty installation of gas appliances. Conducted indoor air quality study, advised counsel on merits of case, and participated in discussions with plaintiffs. Case settled.

- Assisted property owners in Silicon Valley in lawsuit to recover remediation costs from insurer for large TCE plume originating from a manufacturing facility. Conducted investigations to demonstrate sudden and accidental release of TCE, including groundwater modeling, development of method to date spill, preparation of chemical inventory, investigation of historical waste disposal practices and standards, and on-site sewer and storm drainage inspections and sampling. Prepared declaration in opposition to motion for summary judgment. Case settled.
- Assisted residents in east Oakland downwind of a former battery plant in class action lawsuit alleging property contamination from lead emissions. Conducted historical research and dry deposition modeling that substantiated claim. Participated in mediation at JAMS. Case settled.
- Assisted property owners in West Oakland who purchased a former gas station that had leaking underground storage tanks and groundwater contamination. Reviewed agency files and advised counsel on merits of case. Prepared declaration in opposition to summary judgment. Prepared cost estimate to remediate site. Participated in settlement discussions. Case settled.
- Consultant to counsel representing plaintiffs in two Clean Water Act lawsuits involving selenium discharges into San Francisco Bay from refineries. Reviewed files and advised counsel on merits of case. Prepared interrogatory and discovery questions, assisted in deposing opposing experts, and reviewed and interpreted treatability and other technical studies. Judge ruled in favor of plaintiffs.
- Assisted oil company in a complaint filed by a resident of a small California beach community alleging that discharges of tank farm rinse water into the sanitary sewer system caused hydrogen sulfide gas to infiltrate residence, sending occupants to hospital. Inspected accident site, interviewed parties to the event, and reviewed extensive agency files related to incident. Used chemical analysis, field simulations, mass balance calculations, sewer hydraulic simulations with SWMM44, atmospheric dispersion modeling with SCREEN3, odor analyses, and risk assessment calculations to demonstrate that the incident was caused by a faulty drain trap and inadequate slope of sewer lateral on resident's property. Prepared a detailed technical report summarizing these studies. Case settled.
- Assisted large West Coast city in suit alleging that leaking underground storage tanks on city property had damaged the waterproofing on downgradient building, causing leaks in an underground parking structure. Reviewed subsurface hydrogeologic investigations and evaluated studies conducted by others documenting leakage from underground diesel and gasoline tanks. Inspected, tested, and evaluated waterproofing on subsurface parking structure. Waterproofing was substandard. Case settled.
- Assisted residents downwind of gravel mine and asphalt plant in Siskiyou County, California, in suit to obtain CEQA review of air permitting action. Prepared two declarations analyzing

air quality and public health impacts. Judge ruled in favor of plaintiffs, closing mine and asphalt plant.

- Assisted defendant oil company on the California Central Coast in class action lawsuit alleging property damage and health effects from subsurface petroleum contamination. Reviewed documents, prepared risk calculations, and advised counsel on merits of case. Participated in settlement discussions. Case settled.
- Assisted defendant oil company in class action lawsuit alleging health impacts from remediation of petroleum contaminated site on California Central Coast. Reviewed documents, designed and conducted monitoring program, and participated in settlement discussions. Case settled.
- Consultant to attorneys representing irrigation districts and municipal water districts to evaluate a potential challenge of USFWS actions under CVPIA section 3406(b)(2). Reviewed agency files and collected and analyzed hydrology, water quality, and fishery data. Advised counsel on merits of case. Case not filed.
- Assisted residents downwind of a Carson refinery in class action lawsuit involving soil and groundwater contamination, nuisance, property damage, and health effects from air emissions. Reviewed files and provided advice on contaminated soil and groundwater, toxic emissions, and health risks. Prepared declaration on refinery fugitive emissions. Prepared deposition questions and reviewed deposition transcripts on air quality, soil contamination, odors, and health impacts. Case settled.
- Assisted residents downwind of a Contra Costa refinery who were affected by an accidental release of naphtha. Characterized spilled naphtha, estimated emissions, and modeled ambient concentrations of hydrocarbons and sulfur compounds. Deposed. Presented testimony in binding arbitration at JAMS. Judge found in favor of plaintiffs.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects from several large accidents as well as routine operations. Reviewed files and prepared analyses of environmental impacts. Prepared declarations, deposed, and presented testimony before jury in one trial and judge in second. Case settled.
- Assisted business owner claiming damages from dust, noise, and vibration during a sewer construction project in San Francisco. Reviewed agency files and PM10 monitoring data and advised counsel on merits of case. Case settled.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects. Prepared declaration in opposition to summary judgment, deposed, and presented expert testimony on accidental releases, odor, and nuisance before jury. Case thrown out by judge, but reversed on appeal and not retried.

- Presented testimony in small claims court on behalf of residents claiming health effects from hydrogen sulfide from flaring emissions triggered by a power outage at a Contra Costa County refinery. Analyzed meteorological and air quality data and evaluated potential health risks of exposure to low concentrations of hydrogen sulfide. Judge awarded damages to plaintiffs.
- Assisted construction unions in challenging PSD permit for an Indiana steel mill. Prepared technical comments on draft PSD permit, drafted 70-page appeal of agency permit action to the Environmental Appeals Board challenging permit based on faulty BACT analysis for electric arc furnace and reheat furnace and faulty permit conditions, among others, and drafted briefs responding to four parties. EPA Region V and the EPA General Counsel intervened as amici, supporting petitioners. EAB ruled in favor of petitioners, remanding permit to IDEM on three key issues, including BACT for the reheat furnace and lead emissions from the EAF. Drafted motion to reconsider three issues. Prepared 69 pages of technical comments on revised draft PSD permit. Drafted second EAB appeal addressing lead emissions from the EAF and BACT for reheat furnace based on European experience with SCR/SNCR. Case settled. Permit was substantially improved. See *In re: Steel Dynamics, Inc.*, PSD Appeal Nos. 99-4 & 99-5 (EAB June 22, 2000).
- Assisted defendant urea manufacturer in Alaska in negotiations with USEPA to seek relief from penalties for alleged violations of the Clean Air Act. Reviewed and evaluated regulatory files and monitoring data, prepared technical analysis demonstrating that permit limits were not violated, and participated in negotiations with EPA to dismiss action. Fines were substantially reduced and case closed.
- Assisted construction unions in challenging PSD permitting action for an Indiana grain mill. Prepared technical comments on draft PSD permit and assisted counsel draft appeal of agency permit action to the Environmental Appeals Board challenging permit based on faulty BACT analyses for heaters and boilers and faulty permit conditions, among others. Case settled.
- As part of a consent decree settling a CEQA lawsuit, assisted neighbors of a large west coast port in negotiations with port authority to secure mitigation for air quality impacts. Prepared technical comments on mobile source air quality impacts and mitigation and negotiated a $9 million CEQA mitigation package. Represented neighbors on technical advisory committee established by port to implement the air quality mitigation program. Program successfully implemented.
- Assisted construction unions in challenging permitting action for a California hazardous waste incinerator. Prepared technical comments on draft permit, assisted counsel prepare appeal of EPA permit to the Environmental Appeals Board. Participated in settlement discussions on technical issues with applicant and EPA Region 9. Case settled.

- Assisted environmental group in challenging DTSC Negative Declaration on a hazardous waste treatment facility. Prepared technical comments on risk of upset, water, and health risks. Writ of mandamus issued.
- Assisted several neighborhood associations and cities impacted by quarries, asphalt plants, and cement plants in Alameda, Shasta, Sonoma, and Mendocino counties in obtaining mitigations for dust, air quality, public health, traffic, and noise impacts from facility operations and proposed expansions.
- For over 100 industrial facilities, commercial/campus, and redevelopment projects, developed the record in preparation for CEQA and NEPA lawsuits. Prepared technical comments on hazardous materials, solid wastes, public utilities, noise, worker safety, air quality, public health, water resources, water quality, traffic, and risk of upset sections of EIRs, EISs, FONSIs, initial studies, and negative declarations. Assisted counsel in drafting petitions and briefs and prepared declarations.
- For several large commercial development projects and airports, assisted applicant and counsel prepare defensible CEQA documents, respond to comments, and identify and evaluate "all feasible" mitigation to avoid CEQA challenges. This work included developing mitigation programs to reduce traffic-related air quality impacts based on energy conservation programs, solar, low-emission vehicles, alternative fuels, exhaust treatments, and transportation management associations.

SITE INVESTIGATION/REMEDIATION/CLOSURE

- Technical manager and principal engineer for characterization, remediation, and closure of waste management units at former Colorado oil shale plant. Constituents of concern included BTEX, As, 1,1,1-TCA, and TPH. Completed groundwater monitoring programs, site assessments, work plans, and closure plans for seven process water holding ponds, a refinery sewer system, and processed shale disposal area. Managed design and construction of groundwater treatment system and removal actions and obtained clean closure.
- Principal engineer for characterization, remediation, and closure of process water ponds at a former lanthanide processing plant in Colorado. Designed and implemented groundwater monitoring program and site assessments and prepared closure plan.
- Advised the city of Sacramento on redevelopment of two former railyards. Reviewed work plans, site investigations, risk assessment, RAPS, RI/FSs, and CEQA documents. Participated in the development of mitigation strategies to protect construction and utility workers and the public during remediation, redevelopment, and use of the site, including buffer zones, subslab venting, rail berm containment structure, and an environmental oversight plan.

- Provided technical support for the investigation of a former sanitary landfill that was redeveloped as single family homes. Reviewed and/or prepared portions of numerous documents, including health risk assessments, preliminary endangerment assessments, site investigation reports, work plans, and RI/FSs. Historical research to identify historic waste disposal practices to prepare a preliminary endangerment assessment. Acquired, reviewed, and analyzed the files of 18 federal, state, and local agencies, three sets of construction field notes, analyzed 21 aerial photographs and interviewed 14 individuals associated with operation of former landfill. Assisted counsel in defending lawsuit brought by residents alleging health impacts and diminution of property value due to residual contamination. Prepared summary reports.
- Technical oversight of characterization and remediation of a nitrate plume at an explosives manufacturing facility in Lincoln, CA. Provided interface between owners and consultants. Reviewed site assessments, work plans, closure plans, and RI/FSs.
- Consultant to owner of large western molybdenum mine proposed for NPL listing. Participated in negotiations to scope out consent order and develop scope of work. Participated in studies to determine premining groundwater background to evaluate applicability of water quality standards. Served on technical committees to develop alternatives to mitigate impacts and close the facility, including resloping and grading, various thickness and types of covers, and reclamation. This work included developing and evaluating methods to control surface runoff and erosion, mitigate impacts of acid rock drainage on surface and ground waters, and stabilize nine waste rock piles containing 328 million tons of pyrite-rich, mixed volcanic waste rock (andesites, rhyolite, tuff). Evaluated stability of waste rock piles. Represented client in hearings and meetings with state and federal oversight agencies.

REGULATORY (PARTIAL LIST)

- In December 2020, researched and wrote 23 pages of comments on the Draft Supplemental Recirculated Environmental Impact Report for Revisions to the Kern County Zoning Ordinance – 2020 A, Focused on Oil and Gas Local Permitting on: (a) significant and unmitigated construction emissions; (b) significant and unmitigated operational emissions; (c) public health and biological impacts of criteria pollutants emissions and ozone; (d) offsets not valid CEQA mitigation.
- In October and December 2020, researched and wrote 46 pages of comments on underestimated and unsupported construction emissions, omitted construction emission sources, failure to consider unique site geotechnical conditions; revised construction emissions; significant construction and operational GHG emissions; GHG mitigation; construction and operational health risks; risk of upset; and cumulative impacts for a facility proposed to upgrade landfill gas to pipeline quality natural gas.

- In October and November 2020, researched and wrote 37 pages of comments on significant construction impacts, significant operational VOC emissions, and significant public health impacts of new internal floating roof storage tanks at a marine terminal at the Port of Long Beach.
- In September to November 2020, review proposed permit amendment to add HCN emissions from the FCCU to Title V permit for a Houston Refinery and research and write report on methods to measure HCN from FCCUs in situ and remotely.
- In September and October 2020, researched and wrote 14 pages of comments on proposed Leak Detection and Repair (LDAR) program for controlling VOC emissions from a geothermal power plant.
- In August to October 2020, researched and wrote comments on grid-based impacts of San Francisco's proposed building code mandating that new construction be all electric.
- In July and August 2020, researched and wrote comments on groundwater impacts of sea level rise for Final SEIR on crude oil trucking proposal.
- In June to August 2020, researched and wrote 69 pages of comments on inadequate project description, construction impacts, operational air quality impacts, cumulative air quality impacts, public health impacts, valley fever, hazards, geologic impacts, water use, CEC licensing, and extended lifetime impacts for the repower of a geothermal power plant in Imperial County.
- In June 2020, review revised quarry reclamation plan and draft 27 pages of comments on proposed modification.
- In June and July 2020, researched and wrote 23 pages of comments on cement terminal at Port of Stockton on construction impacts, emission baseline, operational emissions, and greenhouse gas mitigation.
- In May to June 2020, review reclamation plan amendment for quarry and research and write 17 page report on hydrology and water quality impacts of proposed amendment.
- In May 2020, researched and wrote 10 pages of comments on FEIR for a new apartment project in Contra Costa County on GHG emissions from vegetation removal, mobile sources, and water use and mitigation for same.
- In March/April 2020, researched and wrote 50 pages of comments on IS/MND for battery energy storage project in San Jose (Hummingbird) on inadequate project description, criteria pollutant and GHG emissions, significant and unmitigated energy impacts, cumulative impacts, construction impacts, public health impacts from BESS accidents, and battery handling and transportation accidents. Wrote 15 pages of responses to comments on vendor specifications, battery composition, cumulative impacts, construction impacts, fire control methods, and battery accidents.

- In April 2020, researched and wrote 47 pages of comments on IS/MND for data center in Santa Clara (SV1) on operational NOx emissions; out-of-district emissions; interbasin pollutant transport; omitted emission sources; GHG compliance with plans, policies and regulations; indirect GHG emissions; air quality impacts; construction emissions; cumulative impacts; and risk of upset from battery accidents.
- In March 2020, researched and wrote 30 pages of comments on IS/MND for data center in San Jose (Hummingbird) on operational GHG and criteria pollutant emissions, cumulative impacts, and public health risks. Research and write responses to comments.
- In February-March 2020, researched and wrote 30 pages on an IS/MND for a data center in San Jose (Stack) on operational NOx and GHG emissions, cumulative impacts, heath risks, and odor.
- In February 2020, researched and wrote 33 pages of comments on Initial Study for a battery storage facility in Ventura County (Orni) on criteria pollutant and GHG emissions, worker and public health impacts, cumulative impacts, valley fever, and consistency with general plan.
- In February 2020, researched and wrote 20 pages of comments on valley fever in response to applicant's global response to comments on Valley Fever for a wind project in San Diego County.
- In January 2020, researched and wrote 32 pages of comments on the Orni battery storage facility (BESS) on incomplete project description, cumulative GHG and NOx impacts, BESS accidents, and health impacts, including soil contamination and valley fever.
- In January 2020, research and wrote 41 pages of comments on the DEIR for the NuStar Port of Stockton Liquid Bulk Terminal on operational emission calculations, significant NOx emissions, significant GHG emissions. GHG mitigation, and cumulative impacts.
- In December 2019, researched and wrote 3 pages of comments on the Silverstrand Grid battery storage facility on greenhouse gas emissions.
- In December 2019, researched and wrote 15 pages of comments on the Initial Study for the K2 Pure – Chlorine Rail Transportation Curtailment Project, including on air quality baseline, project description, emissions, cancer risks, risk of upset.
- In November 2019, reviewed agency files and researched and wrote 42 pages of comments on the Belridge Solar Project on compliance with local zoning ordinances, water quality impacts, air quality impacts, and worker and public health impacts due to soil contamination and valley fever.
- In October 2019, researched and wrote 49 pages of comments on IS/MND for data center in Santa Clara, CA on operational criteria pollutants (mobile sources, off-site electricity

generation, emergency generators), ambient air quality impacts, greenhouse gas emissions and mitigation, and cumulative impacts.

- In October 2019, researched and wrote 9 pages of comments on the Application, Statement of Basis and draft Permit to Construct and Temporary Permit to Operate for proposed changes at the Paramount Refinery to facilitate refining of biomass-based feedstock to produce renewable fuels.
- In September 2019, reviewed City of Sunnyvale's file on Google's proposed Central Utility Plant and researched and wrote 34 pages of comments on construction and operational air quality impacts, cumulative impacts, and battery fire and explosion impacts. In October 2019, researched and wrote 15 pages of responses to comments.
- In August 2019, research and wrote 37 pages of comments on the DSEIR for the Le Conte Battery Energy Storage System on GHG emissions, hazards and hazardous material impacts, and health impacts.
- In August 2019, researched and wrote 38 pages of comments on IS/MND for the Hanford-Lakeside Dairy digester Project, Kings County, on project description (piecemealing), cumulative impacts, construction impacts, air quality impacts, valley fever and risk of upset.
- In July 2019, researched and wrote 48 pages of comments on IS/MND for the Five Points Pipeline Dairy Digester Cluster Project, including on air quality, cumulative impacts, worker and public health impacts (including on pesticide-contaminated soils), Valley Fever, construction air quality impacts, and risk of upset.
- In June 2019, researched and wrote 15 pages of responses to comments on IS/MND for SV1 Data Center, including operational NOx emissions, air quality analyses, construction emissions, battery hazards, and mitigation plans for noise, vibration, risk management, storm water pollution, and emergency response and evacuation plans.
- In June 2019, researched and wrote 30 pages of comments on DEIR for the Humboldt Wind Energy Project on fire and aesthetic impacts of transmission line, construction air quality impacts and mitigation, and greenhouse gas emissions.
- In May 2019, researched and wrote 25 pages of comments on the DEIR for the ExxonMobil Interim Trucking for Santa Ynez Phased Restart Project on project description, baseline, and mitigation.
- In April 2019, researched and wrote a 16 page letter critiquing the adequacy of the FEIR for CalAm Desalination Project to support a Monterey County Combined Development Permit, consisting of a Use Permit, an Administrative Permit, and Design Approval for the Desalination Plant and Carmel Valley Pump Station.

- In April 2019, researched and wrote 22 pages of comments on DEIR for the Eco-Energy Liquid Bulk Terminal at the Port of Stockton on emissions, air quality impact mitigation, and health risk assessment.
- In March 2019, researched and wrote 43 pages of comments on DEIR for Contanda Renewable Diesel Bulk Liquid Terminal at the Port of Stockton on operational emissions, air quality impacts and mitigation and health risks.
- In February 2019, researched and wrote 36 pages of comments on general cumulative impacts, air quality, accidents, and valley fever for IS/MND for biogas cluster project in Kings County.
- In January 2019, researched and wrote 30 pages of comments on air quality and valley fever for IS/MND for energy storage facility in Kings County.
- In December 2018, researched and wrote 11 pages of comments on air quality for IS/MND for biomass gasification facility in Madera County.
- In December 2018, researched and wrote 10 pages of responses to comments on IS/MND for a wind energy project in Riverside County.
- In December 2018, researched and wrote 12 pages of responses to comments on IS/MND for a large Safeway fueling station in Petaluma. The Planning Commission voted unanimously to require an EIR.
- In November 2018, researched and wrote 30 pages of comments on IS/MND on wind energy project in Riverside County on construction health risks, odor impacts, waste disposal, transportation, construction emissions and mitigation and Valley Fever.
- In November 2018, researched and wrote 32 pages of comments on the DEIR for a solar energy generation and storage project in San Bernardino County on hazards, health risks, odor, construction emissions and mitigation, and Valley Fever.
- In September 2018, researched and wrote 36 pages of comments on the FEIR for the Newland Sierra Project including on greenhouse gas emissions, construction emissions, and cumulative impacts.
- In August 2018, researched and wrote 20 pages of comments on the health risk assessment in the IS/MND for a large Safeway fueling station in Petaluma.
- In August 2018, researched and wrote responses to comments on DEIR for the Newland Sierra Project, San Diego County on greenhouse gas emissions, construction emissions, odor, and Valley Fever.
- In July/August 2018, researched and wrote 12 pages of comments on DEIR for proposed Doheny Desal Project, on GHG, criteria pollutant, and TAC emissions and public health impacts during construction and indirect emissions during operation.

- In June 2018, researched and wrote 12 pages of technical comments rebutting NDDH responses to comments on Meridian Davis Refinery.
- In April 2018, researched and wrote 26 pages of comments on greenhouse gas emissions and mitigation as proposed in the San Diego County Climate Action Plan.
- In April 2018, researched and wrote 24 pages of comments on the FEIR for Monterey County water supply project, including GHG mitigation, air quality impacts and mitigation, and Valley Fever.
- In March-June 2018, researched and wrote 37 pages of comments on the IS/MND for the 2305 Mission College Boulevard Data Center, Santa Clara, California and responded to responses to comments.
- In March 2018, researched and wrote 40 pages of comments on the IS/MND for the Diablo Energy Storage Facility in Pittsburg, California.
- In March 2018, researched and wrote 19 pages of comments on Infill Checklist/Mitigated Negative Declaration for the Legacy@Livermore Project on CalEEMod emission calculations, including NOx and PM10 and construction health risk assessment, including Valley Fever.
- In January 2018, researched and wrote 28 pages of comments on draft Permit to Construct for the Davis Refinery Project, North Dakota, as a minor source of criteria pollutants and HAPs.
- In December 2017, researched and wrote 19 pages of comments on DEIR for the Rialto Bioenergy Facility, Rialto, California.
- In November and December 2017, researched and wrote 6 pages of comments on the Ventura County Air Pollution Control District's Preliminary Determination if Compliance (PDOC) for Mission Rock Energy Center.
- In November 2017, researched and wrote 11 pages of comments on control technology evaluation for the National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry Residual Risk and Technology Review.
- In September and November 2017, prepared comments on revised Negative Declaration for Delicato Winery in San Joaquin County, California.
- In October and November 2017, researched and wrote comments on North City Project Pure Water San Diego Program DEIR/DEIS to reclaim wastewater for municipal use.
- In August 2017, reviewed DEIR on a new residential community in eastern San Diego County (Newland Sierra) and research and wrote 60 pages of comments on air quality, greenhouse gas emissions and health impacts, including Valley Fever.

- In August 2017, reviewed responses to comments on Part 70 operating permit for IGP Methanol's Gulf Coast Methanol Complex, near Myrtle Grove, Louisiana, and researched and wrote comments on metallic HAP issues.
- In July 2017, reviewed the FEIS for an expansion of the Port of Gulfport and researched and wrote 10 pages of comments on air quality and public health.
- In June 2017, reviewed and prepared technical report on an Application for a synthetic minor source construction permit for a new Refinery in North Dakota.
- In June 2017, reviewed responses to NPCA and other comments on the BP Cherry Point Refinery modifications and assisted counsel in evaluating issues to appeal, including GHG BACT, coker heater SCR cost effectiveness analysis, and SO_2 BACT.
- In June 2017, reviewed Part 70 Operating Permit Renewal/Modification for the Noranda Alumina LC/Gramercy Holdings I, LLC alumina processing plant, St. James, Louisiana, and prepared comments on HAP emissions from bauxite feedstock.
- In May and June 2017, reviewed FEIR on Tesoro Integration Project and prepared responses to comments on the DEIR.
- In May 2017, prepared comments on tank VOC and HAP emissions from Tesoro Integration Project, based on real time monitoring at the Tesoro and other refineries in the SCAQMD.
- In April 2017, prepared comments on Negative Declaration for Delicato Winery in San Joaquin County, California.
- In March 2017, reviewed Negative Declaration for Ellmore geothermal facility in Imperial County, California and prepared summary of issues.
- In March 2017, prepared response to Phillips 66 Company's Appeal of the San Luis Obispo County Planning Commission's Decision Denying the Rail Spur Extension Project Proposed for the Santa Maria Refinery.
- In February 2017, researched and wrote comments on Kalama draft Title V permit for 10,000 MT/day methanol production and marine export facility in Kalama, Washington.
- In January 2017, researched and wrote 51 pages of comments on proposed Title V and PSD permits for the St. James Methanol Plant, St. James Louisiana, on BACT and enforceability of permit conditions.
- In December 2016, researched and wrote comments on draft Title V Permit for Yuhuang Chemical Inc. Methanol Plant, St. James, Louisiana, responding to EPA Order addressing enforceability issues.
- In November 2016, researched and wrote comments on Initial Study/Mitigated Negative Declaration for the AES Battery Energy Storage Facility, Long Beach, CA.

- In November 2016, researched and wrote comments on Campo Verde Battery Energy Storage System Draft Environmental Impact Report.
- In October 2016, researched and wrote comments on Title V Permit for NuStar Terminal Operations Partnership L.P, Stockton, CA.
- In October 2016, prepared expert report, Technical Assessment of Achieving the 40 CFR Part 423 Zero Discharge Standard for Bottom Ash Transport Water at the Belle River Power Plant, East China, Michigan. Reported resulted in a 2 year reduction in compliance date for elimination of bottom ash transport water. 1/30/17 DEQ Letter.
- In September 2016, researched and wrote comments on Proposed Title V Permit and Environmental Assessment Statement, Yuhuang Chemical Inc. Methanol Plant, St. James, Louisiana.
- In September 2016, researched and wrote response to "Further Rebuttal in Support of Appeal of Planning Commission Resolution No. 16-1, Denying Use Permit Application 12PLN-00063 and Declining to Certify Final Environmental Impact Report for the Valero Benicia Crude-by-Rail Project.
- In August 2016, reviewed and prepared comments on manuscript: Hutton et al., Freshwater Flows to the San Francisco Bay-Delta Estuary over Nine Decades: Trends Evaluation.
- In August/September 2016, researched and wrote comments on Mitigated Negative Declaration for the Chevron Long Wharf Maintenance and Efficiency Project.
- In July 2016, researched and wrote comments on the Ventura County APCD Preliminary Determination of Compliance and the California Energy Commission Revised Preliminary Staff Assessment for the Puente Power Project.
- In June 2016, researched and wrote comments on an Ordinance (1) Amending the Oakland Municipal Code to Prohibit the Storage and Handling of Coal and Coke at Bulk Material Facilities or Terminals Throughout the City of Oakland and (2) Adopting CEQA Exemption Findings and supporting technical reports. Council approved Ordinance on an 8 to 0 vote on June 27, 2016.
- In May 2016, researched and wrote comments on Draft Title V Permit and Draft Environmental Impact Report for the Tesoro Los Angeles Refinery Integration and Compliance Project.
- In March 2016, researched and wrote comments on Valero's Appeal of Planning Commission's Denial of Valero Crude-by-Rail Project.
- In February 2016, researched and wrote comments on Final Environmental Impact Report, Santa Maria Rail Spur Project.
- In February 2016, researched and wrote comments on Final Environmental Impact Report, Valero Benicia Crude by Rail Project.

- In January 2016, researched and wrote comments on Draft Programmatic Environmental Impact Report for the Southern California Association of Government's (SCAG) 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy.
- In November 2015, researched and wrote comments on Final Environmental Impact Report for Revisions to the Kern County Zoning Ordinance – 2015(C) (Focused on Oil and Gas Local Permitting), November 2015.
- In October 2015, researched and wrote comments on Revised Draft Environmental Report, Valero Benicia Crude by Rail Project.
- In September 2015, prepared report, "Environmental, Health and Safety Impacts of the Proposed Oakland Bulk and Oversized Terminal, and presented oral testimony on September 21, 2015 before Oakland City Council on behalf of the Sierra Club.
- In September 2015, researched and wrote comments on revisions to two chapters of EPA's Air Pollution Control Cost Manual: Docket ID No. EPA-HQ-OAR-2015-0341.
- In June 2015, researched and wrote comments on DEIR for the CalAm Monterey Peninsula Water Supply Project.
- In April 2015, researched and wrote comments on proposed Title V Operating Permit Revision and Prevention of Significant Deterioration Permit for Arizona Public Service's Ocotillo Power Plant Modernization Project (5 GE LMS100 105-MW simple cycle turbines operated as peakers), in Tempe, Arizona; Final permit appealed to EAB.
- In March 2015, researched and wrote "Comments on Proposed Title V Air Permit, Yuhuang Chemical Inc. Methanol Plant, St. James, Louisiana". Client filed petition objecting to the permit. EPA granted majority of issues. In the Matter of Yuhuang Chemical Inc. Methanol Plant, St. James Parish, Louisiana, Permit No. 2560-00295-V0, Issued by the Louisiana Department of Environmental Quality, Petition No. VI-2015-03, Order Responding to the Petitioners' Request for Objection to the Issuance of a Title V Operating Permit, September 1, 2016.
- In February 2015, prepared compilation of BACT cost effectiveness values in support of comments on draft PSD Permit for Bonanza Power Project.
- In January 2015, prepared cost effectiveness analysis for SCR for a 500-MW coal fire power plant, to address unpermitted upgrades in 2000.
- In January 2015, researched and wrote comments on Revised Final Environmental Impact Report for the Phillips 66 Propane Recovery Project. *Communities for a Better Environment et al. v. Contra Costa County et al. Contra Costa County (Superior Court, Contra Costa County, Case No. MSN15-0301, December 1, 2016).*
- In December 2014, researched and wrote "Report on Bakersfield Crude Terminal Permits to Operate." In response, the U.S. EPA cited the Terminal for 10 violations of the Clean Air

Act. The Fifth Appellate District Court upheld the finding in this report in CBE et al v. San Joaquin Valley Unified Air Pollution Control District and Bakersfield Crude Terminal LLC et al, Super. Ct. No. 284013, June 23, 2017.

- In December 2014, researched and wrote comments on Revised Draft Environmental Impact Report for the Phillips 66 Propane Recovery Project.
- In November 2014, researched and wrote comments on Revised Draft Environmental Impact Report for Phillips 66 Rail Spur Extension Project and Crude Unloading Project, Santa Maria, CA to allow the import of tar sands crudes.
- In November 2014, researched and wrote comments on Draft Environmental Impact Report for Phillips 66 Ultra Low Sulfur Diesel Project, responding to the California Supreme Court Decision, *Communities for a Better Environment v. South Coast Air Quality Management Dist. (2010) 48 Cal.4th 310.*
- In November 2014, researched and wrote comments on Draft Environmental Impact Report for the Tesoro Avon Marine Oil Terminal Lease Consideration.
- In October 2014, prepared: "Report on Hydrogen Cyanide Emissions from Fluid Catalytic Cracking Units", pursuant to the Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards, 79 FR 36880.
- In October 2014, researched and wrote technical comments on Final Environmental Impact Reports for Alon Bakersfield Crude Flexibility Project to build a rail terminal to allow the import/export of tar sands and Bakken crude oils and to upgrade an existing refinery to allow it to process a wide range of crudes.
- In October 2014, researched and wrote technical comments on the Title V Permit Renewal and three De Minimus Significant Revisions for the Tesoro Logistics Marine Terminal in the SCAQMD.
- In September 2014, researched and wrote technical comments on the Draft Environmental Impact Report for the Valero Crude by Rail Project.
- In August 2014, for EPA Region 6, prepared technical report on costing methods for upgrades to existing scrubbers at coal-fired power plants.
- In July 2014, researched and wrote technical comments on Draft Final Environmental Impact Reports for Alon Bakersfield Crude Flexibility Project to build a rail terminal to allow the import/export of tar sands and Bakken crude oils and to upgrade an existing refinery to allow it to process a wide range of crudes.
- In June 2014, researched and wrote technical report on Initial Study and Draft Negative Declaration for the Tesoro Logistics Storage Tank Replacement and Modification Project.
- In May 2014, researched and wrote technical comments on Intent to Approve a new refinery and petroleum transloading operation in Utah.

- In March and April 2014, prepared declarations on air permits issued for two crude-by-rail terminals in California, modified to switch from importing ethanol to importing Bakken crude oils by rail and transferring to tanker cars. Permits were issued without undergoing CEQA review. One permit was upheld by the San Francisco Superior Court as statute of limitations had run. The Sacramento Air Quality Management District withdrew the second one due to failure to require BACT and conduct CEQA review.
- In March 2014, researched and wrote technical report on Negative Declaration for a proposed modification of the air permit for a bulk petroleum and storage terminal to the allow the import of tar sands and Bakken crude oil by rail and its export by barge, under the New York State Environmental Quality Review Act (SEQRA).
- In February 2014, researched and wrote technical report on proposed modification of air permit for midwest refinery upgrade/expansion to process tar sands crudes.
- In January 2014, prepared cost estimates to capture, transport, and use CO2 in enhanced oil recovery, from the Freeport LNG project based on both Selexol and Amine systems.
- In January 2014, researched and wrote technical report on Draft Environmental Impact Report for Phillips 66 Rail Spur Extension Project, Santa Maria, CA. Comments addressed project description (piecemealing, crude slate), risk of upset analyses, mitigation measures, alternative analyses and cumulative impacts.
- In November 2013, researched and wrote technical report on the Phillips 66 Propane Recovery Project, Rodeo, CA. Comments addressed project description (piecemealing, crude slate) and air quality impacts.
- In September 2013, researched and wrote technical report on the Draft Authority to Construct Permit for the Casa Diablo IV Geothermal Development Project Environmental Impact Report and Declaration in Support of Appeal and Petition for Stay, U.S. Department of the Interior, Board of Land Appeals, Appeal of Decision Record for the Casa Diablo IV Geothermal Development Project.
- In September 2013, researched and wrote technical report on Effluent Limitation Guidelines for Best Available Technology Economically Available (BAT) for Bottom Ash Transport Waters from Coal-Fired Power Plants in the Steam Electric Power Generating Point Source Category.
- In July 2013, researched and wrote technical report on Initial Study/Mitigated Negative Declaration for the Valero Crude by Rail Project, Benicia, California, Use Permit Application 12PLN-00063.
- In July 2013, researched and wrote technical report on fugitive particulate matter emissions from coal train staging at the proposed Coyote Island Terminal, Oregon, for draft Permit No. 25-0015-ST-01.

- In July 2013, researched and wrote technical comments on air quality impacts of the Finger Lakes LPG Storage Facility as reported in various Environmental Impact Statements.
- In July 2013, researched and wrote technical comments on proposed Greenhouse Gas PSD Permit for the Celanese Clear Lake Plant, including cost analysis of CO2 capture, transport, and sequestration.
- In June/July 2013, researched and wrote technical comments on proposed Draft PSD Preconstruction Permit for Greenhouse Gas Emission for the ExxonMobil Chemical Company Baytown Olefins Plant, including cost analysis of CO2 capture, transport, and sequestration.
- In June 2013, researched and wrote technical report on a Mitigated Negative Declaration for a new rail terminal at the Valero Benicia Refinery to import increased amounts of "North American" crudes. Comments addressed air quality impacts of refining increased amounts of tar sands crudes.
- In June 2013, researched and wrote technical report on Draft Environmental Impact Report for the California Ethanol and Power Imperial Valley 1 Project.
- In May 2013, researched and wrote comments on draft PSD permit for major expansion of midwest refinery to process 100% tar sands crudes, including a complex netting analysis involving debottlenecking, piecemealing, and BACT analyses.
- In April 2013, researched and wrote technical report on the Draft Supplemental Environmental Impact Statement (DSEIS) for the Keystone XL Pipeline on air quality impacts from refining increased amount of tar sands crudes at Refineries in PADD 3.
- In October 2012, researched and wrote technical report on the Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow on fugitive particulate matter emissions.
- In October 2012-October 2014, review and evaluate Flint Hills West Application for an expansion/modification for increased (Texas, Eagle Ford Shale) crude processing and related modification, including netting and BACT analysis. Assist in settlement discussions.
- In February 2012, researched and wrote comments on BART analysis in PA Regional Haze SIP, 77 FR 3984 (Jan. 26, 2012). On Sept. 29, 2015, a federal appeals court overturned the U.S. EPA's approval of this plan, based in part on my comments, concluding "..we will vacate the 2014 Final Rule to the extent it approved Pennsylvania's source-specific BART analysis and remand to the EPA for further proceedings consistent with this Opinion." Nat'l Parks Conservation Assoc. v. EPA, 3d Cir., No. 14-3147, 9/19/15.
- Prepared cost analyses and comments on New York's proposed BART determinations for NOx, SO2, and PM and EPA's proposed approval of BART determinations for Danskammer Generating Station under New York Regional Haze State Implementation Plan and Federal Implementation Plan, 77 FR 51915 (August 28, 2012).

- Prepared cost analyses and comments on NOx BART determinations for Regional Haze State Implementation Plan for State of Nevada, 77 FR 23191 (April 18, 2012) and 77 FR 25660 (May 1, 2012).
- Prepared analyses of and comments on New Source Performance Standards for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 FR 22392 (April 13, 2012).
- Researched and wrote comments on CASPR-BART emission equivalency and NOx and PM BART determinations in EPA proposed approval of State Implementation Plan for Pennsylvania Regional Haze Implementation Plan, 77 FR 3984 (January 26, 2012).
- Researched and wrote comments and statistical analyses on hazardous air pollutants (HAPs) emission controls, monitoring, compliance methods, and the use of surrogates for acid gases, organic HAPs, and metallic HAPs for proposed National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units, 76 FR 24976 (May 3, 2011).
- Prepared cost analyses and comments on NOx BART determinations and emission reductions for proposed Federal Implementation Plan for Four Corners Power Plant, 75 FR 64221 (October 19, 2010).
- Prepared cost analyses and comments on NOx BART determinations for Colstrip Units 1- 4 for Montana State Implementation Plan and Regional Haze Federal Implementation Plan, 77 FR 23988 (April 20, 2010).
- For EPA Region 8, prepared report: Revised BART Cost Effectiveness Analysis for Tail-End Selective Catalytic Reduction at the Basin Electric Power Cooperative Leland Olds Station Unit 2 Final Report, March 2011, in support of 76 FR 58570 (Sept. 21, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Selective Catalytic Reduction at the Public Service Company of New Mexico San Juan Generating Station, November 2010, in support of 76 FR 52388 (Aug. 22, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Flue Gas Desulfurization at Coal-Fired Electric Generating Units in Oklahoma: Sooner Units 1 & 2, Muskogee Units 4 & 5, Northeastern Units 3 &4, October 2010, in support of 76 FR 16168 (March 26, 2011). My work was upheld in: *State of Oklahoma v. EPA*, App. Case 12-9526 (10th Cri. July 19, 2013).
- Identified errors in N_2O emission factors in the Mandatory Greenhouse Gas Reporting Rule, 40 CFR 98, and prepared technical analysis to support Petition for Rulemaking to Correct Emissions Factors in the Mandatory Greenhouse Gas Reporting Rule, filed with EPA on 10/28/10.

- Assisted interested parties develop input for and prepare comments on the Information Collection Request for Petroleum Refinery Sector NSPS and NESHAP Residual Risk and Technology Review, 75 FR 60107 (9/29/10).
- Technical reviewer of EPA's "Emission Estimation Protocol for Petroleum Refineries," posted for public comments on CHIEF on 12/23/09, prepared in response to the City of Houston's petition under the Data Quality Act (March 2010).
- Researched and wrote comments on SCR cost effectiveness for EPA's Advanced Notice of Proposed Rulemaking, Assessment of Anticipated Visibility Improvements at Surrounding Class I Areas and Cost Effectiveness of Best Available Retrofit Technology for Four Corners Power Plant and Navajo Generating Station, 74 FR 44313 (August 28, 2009).
- Researched and wrote comments on Proposed Rule for Standards of Performance for Coal Preparation and Processing Plants, 74 FR 25304 (May 27, 2009).
- Prepared comments on draft PSD permit for major expansion of midwest refinery to process up to 100% tar sands crudes. Participated in development of monitoring and controls to mitigate impacts and in negotiating a Consent Decree to settle claims in 2008.
- Reviewed and assisted interested parties prepare comments on proposed Kentucky air toxic regulations at 401 KAR 64:005, 64:010, 64:020, and 64:030 (June 2007).
- Prepared comments on proposed Standards of Performance for Electric Utility Steam Generating Units and Small Industrial-Commercial-Industrial Steam Generating Units, 70 FR 9706 (February 28, 2005).
- Prepared comments on Louisville Air Pollution Control District proposed Strategic Toxic Air Reduction regulations.
- Prepared comments and analysis of BAAQMD Regulation, Rule 11, Flare Monitoring at Petroleum Refineries.
- Prepared comments on Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electricity Utility Steam Generating Units (MACT standards for coal-fired power plants).
- Prepared Authority to Construct Permit for remediation of a large petroleum-contaminated site on the California Central Coast. Negotiated conditions with agencies and secured permits.
- Prepared Authority to Construct Permit for remediation of a former oil field on the California Central Coast. Participated in negotiations with agencies and secured permits.
- Prepared and/or reviewed hundreds of environmental permits, including NPDES, UIC, Stormwater, Authority to Construct, Prevention of Significant Deterioration, Nonattainment New Source Review, Title V, and RCRA, among others.

- Participated in the development of the CARB document, *Guidance for Power Plant Siting and Best Available Control Technology*, including attending public workshops and filing technical comments.
- Performed data analyses in support of adoption of emergency power restoration standards by the California Public Utilities Commission for "major" power outages, where major is an outage that simultaneously affects 10% of the customer base.
- Drafted portions of the Good Neighbor Ordinance to grant Contra Costa County greater authority over safety of local industry, particularly chemical plants and refineries.
- Participated in drafting BAAQMD Regulation 8, Rule 28, Pressure Relief Devices, including participation in public workshops, review of staff reports, draft rules and other technical materials, preparation of technical comments on staff proposals, research on availability and costs of methods to control PRV releases, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and cost of low-leak technology, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 25, Pumps and Compressors, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak and seal-less technology, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 5, Storage of Organic Liquids, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of controlling tank emissions, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors at Petroleum Refinery Complexes, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 22, Valves and Flanges at Chemical Plants, etc, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 25, Pump and Compressor Seals, including participation in public workshops, review of staff reports, proposed rules, and other

supporting technical material, preparation of technical comments on staff proposals, research on availability of low-leak technology, and presentation of testimony before the Board.

- Participated in the development of the BAAQMD Regulation 2, Rule 5, Toxics, including participation in public workshops, review of staff proposals, and preparation of technical comments.
- Participated in the development of SCAQMD Rule 1402, Control of Toxic Air Contaminants from Existing Sources, and proposed amendments to Rule 1401, New Source Review of Toxic Air Contaminants, in 1993, including review of staff proposals and preparation of technical comments on same.
- Participated in the development of the Sunnyvale Ordinance to Regulate the Storage, Use and Handling of Toxic Gas, which was designed to provide engineering controls for gases that are not otherwise regulated by the Uniform Fire Code.
- Participated in the drafting of the Statewide Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries, including participation in workshops, review of draft plans, preparation of technical comments on draft plans, and presentation of testimony before the SWRCB.
- Participated in developing Se permit effluent limitations for the five Bay Area refineries, including review of staff proposals, statistical analyses of Se effluent data, review of literature on aquatic toxicity of Se, preparation of technical comments on several staff proposals, and presentation of testimony before the Bay Area RWQCB.
- Represented the California Department of Water Resources in the 1991 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on a striped bass model developed by the California Department of Fish and Game.
- Represented the State Water Contractors in the 1987 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on natural flows, historical salinity trends in San Francisco Bay, Delta outflow, and hydrodynamics of the South Bay.
- Represented interveners in the licensing of over 20 natural-gas-fired power plants and one coal gasification plant at the California Energy Commission and elsewhere. Reviewed and prepared technical comments on applications for certification, preliminary staff assessments, final staff assessments, preliminary determinations of compliance, final determinations of compliance, and prevention of significant deterioration permits in the areas of air quality, water supply, water quality, biology, public health, worker safety, transportation, site contamination, cooling systems, and hazardous materials. Presented written and oral testimony in evidentiary hearings with cross examination and rebuttal. Participated in technical workshops.

- Represented several parties in the proposed merger of San Diego Gas & Electric and Southern California Edison. Prepared independent technical analyses on health risks, air quality, and water quality. Presented written and oral testimony before the Public Utilities Commission administrative law judge with cross examination and rebuttal.
- Represented a PRP in negotiations with local health and other agencies to establish impact of subsurface contamination on overlying residential properties. Reviewed health studies prepared by agency consultants and worked with agencies and their consultants to evaluate health risks.

WATER QUALITY/RESOURCES

- Directed and participated in research on environmental impacts of energy development in the Colorado River Basin, including contamination of surface and subsurface waters and modeling of flow and chemical transport through fractured aquifers.
- Played a major role in Northern California water resource planning studies since the early 1970s. Prepared portions of the Basin Plans for the Sacramento, San Joaquin, and Delta basins including sections on water supply, water quality, beneficial uses, waste load allocation, and agricultural drainage. Developed water quality models for the Sacramento and San Joaquin Rivers.
- Conducted hundreds of studies over the past 40 years on Delta water supplies and the impacts of exports from the Delta on water quality and biological resources of the Central Valley, Sacramento-San Joaquin Delta, and San Francisco Bay. Typical examples include:
    1. Evaluate historical trends in salinity, temperature, and flow in San Francisco Bay and upstream rivers to determine impacts of water exports on the estuary;
    2. Evaluate the role of exports and natural factors on the food web by exploring the relationship between salinity and primary productivity in San Francisco Bay, upstream rivers, and ocean;
    3. Evaluate the effects of exports, other in-Delta, and upstream factors on the abundance of salmon and striped bass;
    4. Review and critique agency fishery models that link water exports with the abundance of striped bass and salmon;
    5. Develop a model based on GLMs to estimate the relative impact of exports, water facility operating variables, tidal phase, salinity, temperature, and other variables on the survival of salmon smolts as they migrate through the Delta;
    6. Reconstruct the natural hydrology of the Central Valley using water balances, vegetation mapping, reservoir operation models to simulate flood basins, precipitation records, tree ring research, and historical research;

7. Evaluate the relationship between biological indicators of estuary health and down-estuary position of a salinity surrogate (X2);
8. Use real-time fisheries monitoring data to quantify impact of exports on fish migration;
9. Refine/develop statistical theory of autocorrelation and use to assess strength of relationships between biological and flow variables;
10. Collect, compile, and analyze water quality and toxicity data for surface waters in the Central Valley to assess the role of water quality in fishery declines;
11. Assess mitigation measures, including habitat restoration and changes in water project operation, to minimize fishery impacts;
12. Evaluate the impact of unscreened agricultural water diversions on abundance of larval fish;
13. Prepare and present testimony on the impacts of water resources development on Bay hydrodynamics, salinity, and temperature in water rights hearings;
14. Evaluate the impact of boat wakes on shallow water habitat, including interpretation of historical aerial photographs;
15. Evaluate the hydrodynamic and water quality impacts of converting Delta islands into reservoirs;
16. Use a hydrodynamic model to simulate the distribution of larval fish in a tidally influenced estuary;
17. Identify and evaluate non-export factors that may have contributed to fishery declines, including predation, shifts in oceanic conditions, aquatic toxicity from pesticides and mining wastes, salinity intrusion from channel dredging, loss of riparian and marsh habitat, sedimentation from upstream land alternations, and changes in dissolved oxygen, flow, and temperature below dams.

- Developed, directed, and participated in a broad-based research program on environmental issues and control technology for energy industries including petroleum, oil shale, coal mining, and coal slurry transport. Research included evaluation of air and water pollution, development of novel, low-cost technology to treat and dispose of wastes, and development and application of geohydrologic models to evaluate subsurface contamination from in-situ retorting. The program consisted of government and industry contracts and employed 45 technical and administrative personnel.
- Coordinated an industry task force established to investigate the occurrence, causes, and solutions for corrosion/erosion and mechanical/engineering failures in the waterside systems (e.g., condensers, steam generation equipment) of power plants. Corrosion/erosion failures

caused by water and steam contamination that were investigated included waterside corrosion caused by poor microbiological treatment of cooling water, steam-side corrosion caused by ammonia-oxygen attack of copper alloys, stress-corrosion cracking of copper alloys in the air cooling sections of condensers, tube sheet leaks, oxygen in-leakage through condensers, volatilization of silica in boilers and carry over and deposition on turbine blades, and iron corrosion on boiler tube walls. Mechanical/engineering failures investigated included: steam impingement attack on the steam side of condenser tubes, tube-to-tube-sheet joint leakage, flow-induced vibration, structural design problems, and mechanical failures due to stresses induced by shutdown, startup and cycling duty, among others. Worked with electric utility plant owners/operators, condenser and boiler vendors, and architect/engineers to collect data to document the occurrence of and causes for these problems, prepared reports summarizing the investigations, and presented the results and participated on a committee of industry experts tasked with identifying solutions to prevent condenser failures.

- Evaluated the cost effectiveness and technical feasibility of using dry cooling and parallel dry-wet cooling to reduce water demands of several large natural-gas fired power plants in California and Arizona.
- Designed and prepared cost estimates for several dry cooling systems (e.g., fin fan heat exchangers) used in chemical plants and refineries.
- Designed, evaluated, and costed several zero liquid discharge systems for power plants.
- Evaluated the impact of agricultural and mining practices on surface water quality of Central Valley steams. Represented municipal water agencies on several federal and state advisory committees tasked with gathering and assessing relevant technical information, developing work plans, and providing oversight of technical work to investigate toxicity issues in the watershed.

AIR QUALITY/PUBLIC HEALTH

- Prepared or reviewed the air quality and public health sections of hundreds of EIRs and EISs on a wide range of industrial, commercial and residential projects.
- Prepared or reviewed hundreds of NSR and PSD permits for a wide range of industrial facilities.
- Designed, implemented, and directed a 2-year-long community air quality monitoring program to assure that residents downwind of a petroleum-contaminated site were not impacted during remediation of petroleum-contaminated soils. The program included real-time monitoring of particulates, diesel exhaust, and BTEX and time integrated monitoring for over 100 chemicals.
- Designed, implemented, and directed a 5-year long source, industrial hygiene, and ambient monitoring program to characterize air emissions, employee exposure, and downwind environmental impacts of a first-generation shale oil plant. The program included stack

monitoring of heaters, boilers, incinerators, sulfur recovery units, rock crushers, API separator vents, and wastewater pond fugitives for arsenic, cadmium, chlorine, chromium, mercury, 15 organic indicators (e.g., quinoline, pyrrole, benzo(a)pyrene, thiophene, benzene), sulfur gases, hydrogen cyanide, and ammonia. In many cases, new methods had to be developed or existing methods modified to accommodate the complex matrices of shale plant gases.

- Conducted investigations on the impact of diesel exhaust from truck traffic from a wide range of facilities including mines, large retail centers, light industrial uses, and sports facilities. Conducted traffic surveys, continuously monitored diesel exhaust using an aethalometer, and prepared health risk assessments using resulting data.
- Conducted indoor air quality investigations to assess exposure to natural gas leaks, pesticides, molds and fungi, soil gas from subsurface contamination, and outgasing of carpets, drapes, furniture and construction materials. Prepared health risk assessments using collected data.
- Prepared health risk assessments, emission inventories, air quality analyses, and assisted in the permitting of over 70 1 to 2 MW emergency diesel generators.
- Prepare over 100 health risk assessments, endangerment assessments, and other health-based studies for a wide range of industrial facilities.
- Developed methods to monitor trace elements in gas streams, including a continuous real-time monitor based on the Zeeman atomic absorption spectrometer, to continuously measure mercury and other elements.
- Performed nuisance investigations (odor, noise, dust, smoke, indoor air quality, soil contamination) for businesses, industrial facilities, and residences located proximate to and downwind of pollution sources.

PUBLICATIONS AND PRESENTATIONS (Partial List - Representative Publications)

J.P. Fox, P.H. Hutton, D.J. Howes, A.J. Draper, and L. Sears, Reconstructing the Natural Hydrology of the San Francisco Bay-Delta Watershed, Hydrology and Earth System Sciences, Special Issue: Predictions under Change: Water, Earth, and Biota in the Anthropocene, v. 19, pp. 4257-4274, 2015. http://www.hydrol-earth-syst-sci.net/19/4257/2015/hess-19-4257-2015.pdf. See also: Estimates of Natural and Unimpaired Flows for the Central Valley of California: Water Years 1922-2014 at: https://msb.water.ca.gov/documents/86728/a702a57f-ae7a-41a3-8bff-722e144059d6.

D. Howes, P. Fox, and P. Hutton, Evapotranspiration from Natural Vegetation in the Central Valley of California: Monthly Grass Reference Based Vegetation Coefficients and the Dual Crop Coefficient Approach, *Journal of Hydrologic Engineering*, v.20, no. 10, October 2015.

Phyllis Fox and Lindsey Sears, *Natural Vegetation in the Central Valley of California*, June 2014, Prepared for State Water Contractors and San Luis & Delta-Mendota Water Authority, 311 pg.

J.P. Fox, T.P. Rose, and T.L. Sawyer, Isotope Hydrology of a Spring-fed Waterfall in Fractured Volcanic Rock, 2007.

C.E. Lambert, E.D. Winegar, and Phyllis Fox, Ambient and Human Sources of Hydrogen Sulfide: An Explosive Topic, Air & Waste Management Association, June 2000, Salt Lake City, UT.

San Luis Obispo County Air Pollution Control District and San Luis Obispo County Public Health Department, *Community Monitoring Program,* February 8, 1999.

The Bay Institute, *From the Sierra to the Sea. The Ecological History of the San Francisco Bay-Delta Watershed*, 1998.

J. Phyllis Fox, *Well Interference Effects of HDPP's Proposed Wellfield in the Victor Valley Water District*, Prepared for the California Unions for Reliable Energy (CURE), October 12, 1998.

J. Phyllis Fox, *Air Quality Impacts of Using CPVC Pipe in Indoor Residential Potable Water Systems*, Report Prepared for California Pipe Trades Council, California Firefighters Association, and other trade associations, August 29, 1998.

J. Phyllis Fox and others, *Authority to Construct Avila Beach Remediation Project*, Prepared for Unocal Corporation and submitted to San Luis Obispo Air Pollution Control District, June 1998.

J. Phyllis Fox and others, *Authority to Construct Former Guadalupe Oil Field Remediation Project*, Prepared for Unocal Corporation and submitted to San Luis Obispo Air Pollution Control District, May 1998.

J. Phyllis Fox and Robert Sears, *Health Risk Assessment for the Metropolitan Oakland International Airport Proposed Airport Development Program*, Prepared for Plumbers & Steamfitters U.A. Local 342, December 15, 1997.

Levine-Fricke-Recon (Phyllis Fox and others), *Preliminary Endangerment Assessment Work Plan for the Study Area Operable Unit, Former Solano County Sanitary Landfill, Benicia, California*, Prepared for Granite Management Co. for submittal to DTSC, September 26, 1997.

Phyllis Fox and Jeff Miller, "Fathead Minnow Mortality in the Sacramento River," *IEP Newsletter*, v. 9, n. 3, 1996.

Jud Monroe, Phyllis Fox, Karen Levy, Robert Nuzum, Randy Bailey, Rod Fujita, and Charles Hanson, *Habitat Restoration in Aquatic Ecosystems. A Review of the Scientific Literature Related to the Principles of Habitat Restoration*, Part Two, Metropolitan Water District of Southern California (MWD) Report, 1996.

Phyllis Fox and Elaine Archibald, *Aquatic Toxicity and Pesticides in Surface Waters of the Central Valley*, California Urban Water Agencies (CUWA) Report, September 1997.

Phyllis Fox and Alison Britton, *Evaluation of the Relationship Between Biological Indicators and the Position of X2*, CUWA Report, 1994.

Phyllis Fox and Alison Britton, *Predictive Ability of the Striped Bass Model*, WRINT DWR-206, 1992.

J. Phyllis Fox, *An Historical Overview of Environmental Conditions at the North Canyon Area of the Former Solano County Sanitary Landfill*, Report Prepared for Solano County Department of Environmental Management, 1991.

J. Phyllis Fox, *An Historical Overview of Environmental Conditions at the East Canyon Area of the Former Solano County Sanitary Landfill*, Report Prepared for Solano County Department of Environmental Management, 1991.

Phyllis Fox, *Trip 2 Report, Environmental Monitoring Plan, Parachute Creek Shale Oil Program*, Unocal Report, 1991.

J. P. Fox and others, "Long-Term Annual and Seasonal Trends in Surface Salinity of San Francisco Bay," *Journal of Hydrology*, v. 122, p. 93-117, 1991.

J. P. Fox and others, "Reply to Discussion by D.R. Helsel and E.D. Andrews on Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 27, no. 2, 1991.

J. P. Fox and others, "Reply to Discussion by Philip B. Williams on Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 27, no. 2, 1991.

J. P. Fox and others, "Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 26, no. 1, 1990.

J. P. Fox, "Water Development Increases Freshwater Flow to San Francisco Bay," *SCWC Update*, v. 4, no. 2, 1988.

J. P. Fox, *Freshwater Inflow to San Francisco Bay Under Natural Conditions*, State Water Contractors, Exhibit 262, 58 pp., 1987; http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/ccwd/spprt_docs/ccwd_fox_1987a.pdf.

J. P. Fox, "The Distribution of Mercury During Simulated In-Situ Oil Shale Retorting," *Environmental Science and Technology*, v. 19, no. 4, pp. 316-322, 1985.

J. P. Fox, "El Mercurio en el Medio Ambiente: Aspectos Referentes al Peru," (Mercury in the Environment: Factors Relevant to Peru) Proceedings of Simposio Los Pesticidas y el Medio

Ambiente," ONERN-CONCYTEC, Lima, Peru, April 25-27, 1984. (Also presented at Instituto Tecnologico Pesquero and Instituto del Mar del Peru.)

J. P. Fox, "Mercury, Fish, and the Peruvian Diet," *Boletin de Investigacion*, Instituto Tecnologico Pesquero, Lima, Peru, v. 2, no. 1, pp. 97-116, l984.

J. P. Fox, P. Persoff, A. Newton, and R. N. Heistand, "The Mobility of Organic Compounds in a Codisposal System," *Proceedings of the Seventeenth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1984.

P. Persoff and J. P. Fox, "Evaluation of Control Technology for Modified In-Situ Oil Shale Retorts," *Proceedings of the Sixteenth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1983.

J. P. Fox, *Leaching of Oil Shale Solid Wastes: A Critical Review*, University of Colorado Report, 245 pp., July 1983.

J. P. Fox, *Source Monitoring for Unregulated Pollutants from the White River Oil Shale Project*, VTN Consolidated Report, June 1983.

A. S. Newton, J. P. Fox, H. Villarreal, R. Raval, and W. Walker II, *Organic Compounds in Coal Slurry Pipeline Waters*, Lawrence Berkeley Laboratory Report LBL-15121, 46 pp., Sept. 1982.

M. Goldstein et al., *High Level Nuclear Waste Standards Analysis, Regulatory Framework Comparison*, Battelle Memorial Institute Report No. BPMD/82/E515-06600/3, Sept. 1982.

J. P. Fox et al., *Literature and Data Search of Water Resource Information of the Colorado, Utah, and Wyoming Oil Shale Basins*, Vols. 1-12, Bureau of Land Management, 1982.

A. T. Hodgson, M. J. Pollard, G. J. Harris, D. C. Girvin, J. P. Fox, and N. J. Brown, *Mercury Mass Distribution During Laboratory and Simulated In-Situ Retorting*, Lawrence Berkeley Laboratory Report LBL-12908, 39 pp., Feb. 1982.

E. J. Peterson, A. V. Henicksman, J. P. Fox, J. A. O'Rourke, and P. Wagner, *Assessment and Control of Water Contamination Associated with Shale Oil Extraction and Processing*, Los Alamos National Laboratory Report LA-9084-PR, 54 pp., April 1982.

P. Persoff and J. P. Fox, *Control Technology for In-Situ Oil Shale Retorts*, Lawrence Berkeley Laboratory Report LBL-14468, 118 pp., Dec. 1982.

J. P. Fox, *Codisposal Evaluation: Environmental Significance of Organic Compounds*, Development Engineering Report, 104 pp., April 1982.

J. P. Fox, *A Proposed Strategy for Developing an Environmental Water Monitoring Plan for the Paraho-Ute Project*, VTN Consolidated Report, Sept. 1982.

J. P. Fox, D. C. Girvin, and A. T. Hodgson, "Trace Elements in Oil Shale Materials," *Energy and Environmental Chemistry, Fossil Fuels*, v.1, pp. 69-101, 1982.

M. Mehran, T. N. Narasimhan, and J. P. Fox, "Hydrogeologic Consequences of Modified In-situ Retorting Process, Piceance Creek Basin, Colorado," *Proceedings of the Fourteenth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1981 (LBL-12063).

U. S. DOE (J. P. Fox and others), *Western Oil Shale Development: A Technology Assessment*, v. 1-9, Pacific Northwest Laboratory Report PNL-3830, 1981.

J. P. Fox (ed), "Oil Shale Research," Chapter from the *Energy and Environment Division Annual Report 1980*, Lawrence Berkeley Laboratory Report LBL-11989, 82 pp., 1981 (author or co-author of four articles in report).

D.C. Girvin and J.P. Fox, On-Line Zeeman Atomic Absorption Spectroscopy for Mercury Analysis in Oil Shale Gases, U.S. EPA Report EPA-600/7-80-130, June 1980.

J. P. Fox, *The Partitioning of Major, Minor, and Trace Elements during In-Situ Oil Shale Retorting*, Ph.D. Dissertation, U. of Ca., Berkeley, also Report LBL-9062, 441 pp., 1980 (*Diss. Abst. Internat.*, v. 41, no. 7, 1981).

J.P. Fox, "Elemental Composition of Simulated *In Situ* Oil Shale Retort Water," *Analysis of Waters Associated with Alternative Fuel Production, ASTM STP 720*, L.P. Jackson and C.C. Wright, Eds., American Society for Testing and Materials, pp. 101-128, 1981.

J. P. Fox, P. Persoff, P. Wagner, and E. J. Peterson, "Retort Abandonment -- Issues and Research Needs," in *Oil Shale: the Environmental Challenges*, K. K. Petersen (ed.), p. 133, 1980 (Lawrence Berkeley Laboratory Report LBL-11197).

J. P. Fox and T. E. Phillips, "Wastewater Treatment in the Oil Shale Industry," in *Oil Shale: the Environmental Challenges*, K. K. Petersen (ed.), p. 253, 1980 (Lawrence Berkeley Laboratory Report LBL-11214).

R. D. Giauque, J. P. Fox, J. W. Smith, and W. A. Robb, "Geochemical Studies of Two Cores from the Green River Oil Shale Formation," *Transactions*, American Geophysical Union, v. 61, no. 17, 1980.

J. P. Fox, "The Elemental Composition of Shale Oils," Abstracts of Papers, 179th National Meeting, ISBN 0-8412-0542-6, Abstract No. FUEL 17, 1980.

J. P. Fox and P. Persoff, "Spent Shale Grouting of Abandoned In-Situ Oil Shale Retorts," *Proceedings of Second U.S. DOE Environmental Control Symposium*, CONF-800334/1, 1980 (Lawrence Berkeley Laboratory Report LBL-10744).

P. K. Mehta, P. Persoff, and J. P. Fox, "Hydraulic Cement Preparation from Lurgi Spent Shale," *Proceedings of the Thirteenth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1980 (Lawrence Berkeley Laboratory Report LBL-11071).

F. E. Brinckman, K. L. Jewett, R. H. Fish, and J. P. Fox, "Speciation of Inorganic and Organoarsenic Compounds in Oil Shale Process Waters by HPLC Coupled with Graphite Furnace Atomic Absorption (GFAA) Detectors," Abstracts of Papers, Div. of Geochemistry,

Paper No. 20, Second Chemical Congress of the North American Continent, August 25-28, 1980, Las Vegas (1980).

J. P. Fox, D. E. Jackson, and R. H. Sakaji, "Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters," *Proceedings of the Thirteenth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1980 (Lawrence Berkeley Laboratory Report LBL-11072).

J. P. Fox, *The Elemental Composition of Shale Oils*, Lawrence Berkeley Laboratory Report LBL-10745, 1980.

R. H. Fish, J. P. Fox, F. E. Brinckman, and K. L. Jewett, *Fingerprinting Inorganic and Organoarsenic Compounds in Oil Shale Process Waters Using a Liquid Chromatograph Coupled with an Atomic Absorption Detector*, Lawrence Berkeley Laboratory Report LBL-11476, 1980.

National Academy of Sciences (J. P. Fox and others), *Surface Mining of Non-Coal Minerals, Appendix II: Mining and Processing of Oil Shale and Tar Sands*, 222 pp., 1980.

J. P. Fox, "Elemental Composition of Simulated In-Situ Oil Shale Retort Water," in *Analysis of Waters Associated with Alternative Fuel Production*, ASTM STP 720, L. P. Jackson and C. C. Wright (eds.), American Society for Testing and Materials, pp. 101-128, 1980.

R. D. Giauque, J. P. Fox, and J. W. Smith, *Characterization of Two Core Holes from the Naval Oil Shale Reserve Number 1*, Lawrence Berkeley Laboratory Report LBL-10809, 176 pp., December 1980.

B. M. Jones, R. H. Sakaji, J. P. Fox, and C. G. Daughton, "Removal of Contaminative Constituents from Retort Water: Difficulties with Biotreatment and Potential Applicability of Raw and Processed Shales," *EPA/DOE Oil Shale Wastewater Treatability Workshop*, December 1980 (Lawrence Berkeley Laboratory Report LBL-12124).

J. P. Fox, *Water-Related Impacts of In-Situ Oil Shale Processing*, Lawrence Berkeley Laboratory Report LBL-6300, 327 p., December 1980.

M. Mehran, T. N. Narasimhan, and J. P. Fox, *An Investigation of Dewatering for the Modified In-Situ Retorting Process, Piceance Creek Basin, Colorado*, Lawrence Berkeley Laboratory Report LBL-11819, 105 p., October 1980.

J. P. Fox (ed.) "Oil Shale Research," Chapter from the *Energy and Environment Division Annual Report 1979*, Lawrence Berkeley Laboratory Report LBL-10486, 1980 (author or coauthor of eight articles).

E. Ossio and J. P. Fox, *Anaerobic Biological Treatment of In-Situ Oil Shale Retort Water*, Lawrence Berkeley Laboratory Report LBL-10481, March 1980.

J. P. Fox, F. H. Pearson, M. J. Kland, and P. Persoff, *Hydrologic and Water Quality Effects and Controls for Surface and Underground Coal Mining -- State of Knowledge, Issues, and Research Needs*, Lawrence Berkeley Laboratory Report LBL-11775, 1980.

D. C. Girvin, T. Hadeishi, and J. P. Fox, "Use of Zeeman Atomic Absorption Spectroscopy for the Measurement of Mercury in Oil Shale Offgas," *Proceedings of the Oil Shale Symposium: Sampling, Analysis and Quality Assurance*, U.S. EPA Report EPA-600/9-80-022, March 1979 (Lawrence Berkeley Laboratory Report LBL-8888).

D. S. Farrier, J. P. Fox, and R. E. Poulson, "Interlaboratory, Multimethod Study of an In-Situ Produced Oil Shale Process Water," *Proceedings of the Oil Shale Symposium: Sampling, Analysis and Quality Assurance*, U.S. EPA Report EPA-600/9-80-022, March 1979 (Lawrence Berkeley Laboratory Report LBL-9002).

J. P. Fox, J. C. Evans, J. S. Fruchter, and T. R. Wildeman, "Interlaboratory Study of Elemental Abundances in Raw and Spent Oil Shales," *Proceedings of the Oil Shale Symposium: Sampling, Analysis and Quality Assurance*, U.S. EPA Report EPA-600/9-80-022, March 1979 (Lawrence Berkeley Laboratory Report LBL-8901).

J. P. Fox, "Retort Water Particulates," *Proceedings of the Oil Shale Symposium: Sampling, Analysis and Quality Assurance*, U.S. EPA Report EPA-600/9-80-022, March 1979 (Lawrence Berkeley Laboratory Report LBL-8829).

P. Persoff and J. P. Fox, "Control Strategies for In-Situ Oil Shale Retorts," *Proceedings of the Twelfth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1979 (Lawrence Berkeley Laboratory Report LBL-9040).

J. P. Fox and D. L. Jackson, "Potential Uses of Spent Shale in the Treatment of Oil Shale Retort Waters," *Proceedings of the DOE Wastewater Workshop*, Washington, D. C., June 14-15, 1979 (Lawrence Berkeley Laboratory Report LBL-9716).

J. P. Fox, K. K. Mason, and J. J. Duvall, "Partitioning of Major, Minor, and Trace Elements during Simulated In-Situ Oil Shale Retorting," *Proceedings of the Twelfth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1979 (Lawrence Berkeley Laboratory Report LBL-9030).

P. Persoff and J. P. Fox, *Control Strategies for Abandoned In-Situ Oil Shale Retorts*, Lawrence Berkeley Laboratory Report LBL-8780, 106 pp., October 1979.

D. C. Girvin and J. P. Fox, *On-Line Zeeman Atomic Absorption Spectroscopy for Mercury Analysis in Oil Shale Gases*, Environmental Protection Agency Report EPA-600/7-80-130, 95 p., August 1979 (Lawrence Berkeley Laboratory Report LBL-9702).

J. P. Fox, *Water Quality Effects of Leachates from an In-Situ Oil Shale Industry*, Lawrence Berkeley Laboratory Report LBL-8997, 37 pp., April 1979.

J. P. Fox (ed.), "Oil Shale Research," Chapter from the *Energy and Environment Division Annual Report 1978*, Lawrence Berkeley Laboratory Report LBL-9857 August 1979 (author or coauthor of seven articles).

J. P. Fox, P. Persoff, M. M. Moody, and C. J. Sisemore, "A Strategy for the Abandonment of Modified In-Situ Oil Shale Retorts," *Proceedings of the First U.S. DOE Environmental Control Symposium*, CONF-781109, 1978 (Lawrence Berkeley Laboratory Report LBL-6855).

E. Ossio, J. P. Fox, J. F. Thomas, and R. E. Poulson, "Anaerobic Fermentation of Simulated In-Situ Oil Shale Retort Water," *Division of Fuel Chemistry Preprints*, v. 23, no. 2, p. 202-213, 1978 (Lawrence Berkeley Laboratory Report LBL-6855).

J. P. Fox, J. J. Duvall, R. D. McLaughlin, and R. E. Poulson, "Mercury Emissions from a Simulated In-Situ Oil Shale Retort," *Proceedings of the Eleventh Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1978 (Lawrence Berkeley Laboratory Report LBL-7823).

J. P. Fox, R. D. McLaughlin, J. F. Thomas, and R. E. Poulson, "The Partitioning of As, Cd, Cu, Hg, Pb, and Zn during Simulated In-Situ Oil Shale Retorting," *Proceedings of the Tenth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1977.

Bechtel, Inc., *Treatment and Disposal of Toxic Wastes*, Report Prepared for Santa Ana Watershed Planning Agency, 1975.

Bay Valley Consultants, *Water Quality Control Plan for Sacramento, Sacramento-San Joaquin and San Joaquin Basins*, Parts I and II and Appendices A-E, 750 pp., 1974.

POST GRADUATE COURSES
(Partial)

S-Plus Data Analysis, MathSoft, 6/94.
Air Pollutant Emission Calculations, UC Berkeley Extension, 6-7/94
Assessment, Control and Remediation of LNAPL Contaminated Sites, API and USEPA, 9/94
Pesticides in the TIE Process, SETAC, 6/96
Sulfate Minerals: Geochemistry, Crystallography, and Environmental Significance, Mineralogical Society of America/Geochemical Society, 11/00.
Design of Gas Turbine Combined Cycle and Cogeneration Systems, Thermoflow, 12/00
Air-Cooled Steam Condensers and Dry- and Hybrid-Cooling Towers, Power-Gen, 12/01
Combustion Turbine Power Augmentation with Inlet Cooling and Wet Compression, Power-Gen , 12/01
CEQA Update, UC Berkeley Extension, 3/02
The Health Effects of Chemicals, Drugs, and Pollutants, UC Berkeley Extension, 4-5/02
Noise Exposure Assessment: Sampling Strategy and Data Acquisition, AIHA PDC 205, 6/02
Noise Exposure Measurement Instruments and Techniques, AIHA PDC 302, 6/02
Noise Control Engineering, AIHA PDC 432, 6/02
Optimizing Generation and Air Emissions, Power-Gen, 12/02
Utility Industry Issues, Power-Gen, 12/02
Multipollutant Emission Control, Coal-Gen, 8/03
Community Noise, AIHA PDC 104, 5/04
Cutting-Edge Topics in Noise and Hearing Conservation, AIHA 5/04
Selective Catalytic Reduction: From Planning to Operation, Power-Gen, 12/05
Improving the FGD Decision Process, Power-Gen, 12/05
E-Discovery, CEB, 6/06
McIlvaine Hot Topic Hour, FGD Project Delay Factors, 8/10/06
McIlvaine Hot Topic Hour, What Mercury Technologies Are Available, 9/14/06
McIlvaine Hot Topic Hour, SCR Catalyst Choices, 10/12/06
McIlvaine Hot Topic Hour, Particulate Choices for Low Sulfur Coal, 10/19/06
McIlvaine Hot Topic Hour, Impact of PM2.5 on Power Plant Choices, 11/2/06
McIlvaine Hot Topic Hour, Dry Scrubbers, 11/9/06
Cost Estimating and Tricks of the Trade – A Practical Approach, PDH P159, 11/19/06
Process Equipment Cost Estimating by Ratio & Proportion, PDH G127 11/19/06
Power Plant Air Quality Decisions, Power-Gen 11/06
McIlvaine Hot Topic Hour, WE Energies Hg Control Update, 1/12/07
Negotiating Permit Conditions, EEUC, 1/21/07
BACT for Utilities, EEUC, 1/21/07
McIlvaine Hot Topic Hour, Chinese FGD/SCR Program & Impact on World, 2/1/07
McIlvaine Hot Topic Hour, Mercury Control Cost & Performance, 2/15/07
McIlvaine Hot Topic Hour, Mercury CEMS, 4/12/07

Coal-to-Liquids – A Timely Revival, 9th Electric Power, 4/30/07
Advances in Multi-Pollutant and CO_2 Control Technologies, 9th Electric Power, 4/30/07
McIlvaine Hot Topic Hour, Measurement & Control of PM2.5, 5/17/07
McIlvaine Hot Topic Hour, Co-firing and Gasifying Biomass, 5/31/07
McIlvaine Hot Topic Hour, Mercury Cost and Performance, 6/14/07
Ethanol 101: Points to Consider When Building an Ethanol Plant, BBI International, 6/26/07
Low Cost Optimization of Flue Gas Desulfurization Equipment, Fluent, Inc., 7/6/07.
McIlvaine Hot Topic Hour, CEMS for Measurement of NH3, SO3, Low NOx, 7/12/07
McIlvaine Hot Topic Hour, Mercury Removal Status & Cost, 8/9/07
McIlvaine Hot Topic Hour, Filter Media Selection for Coal-Fired Boilers, 9/13/07
McIlvaine Hot Topic Hour, Catalyst Performance on NOx, SO3, Mercury, 10/11/07
PRB Coal Users Group, PRB 101, 12/4/07
McIlvaine Hot Topic Hour, Mercury Control Update, 10/25/07
Circulating Fluidized Bed Boilers, Their Operation, Control and Optimization, Power-Gen, 12/8/07
Renewable Energy Credits & Greenhouse Gas Offsets, Power-Gen, 12/9/07
Petroleum Engineering & Petroleum Downstream Marketing, PDH K117, 1/5/08
Estimating Greenhouse Gas Emissions from Manufacturing, PDH C191, 1/6/08
McIlvaine Hot Topic Hour, NOx Reagents, 1/17/08
McIlvaine Hot Topic Hour, Mercury Control, 1/31/08
McIlvaine Hot Topic Hour, Mercury Monitoring, 3/6/08
McIlvaine Hot Topic Hour, SCR Catalysts, 3/13/08
Argus 2008 Climate Policy Outlook, 3/26/08
Argus Pet Coke Supply and Demand 2008, 3/27/08
McIlvaine Hot Topic Hour, SO3 Issues and Answers, 3/27/08
McIlvaine Hot Topic Hour, Mercury Control, 4/24/08
McIlvaine Hot Topic Hour, Co-Firing Biomass, 5/1/08
McIlvaine Hot Topic Hour, Coal Gasification, 6/5/08
McIlvaine Hot Topic Hour, Spray Driers vs. CFBs, 7/3/08
McIlvaine Hot Topic Hour, Air Pollution Control Cost Escalation, 9/25/08
McIlvaine Hot Topic Hour, Greenhouse Gas Strategies for Coal Fired Power Plant Operators, 10/2/08
McIlvaine Hot Topic Hour, Mercury and Toxics Monitoring, 2/5/09
McIlvaine Hot Topic Hour, Dry Precipitator Efficiency Improvements, 2/12/09
McIlvaine Hot Topic Hour, Coal Selection & Impact on Emissions, 2/26/09
McIlvaine Hot Topic Hour, 98% Limestone Scrubber Efficiency, 7/9/09
McIlvaine Hot Topic Hour, Carbon Management Strategies and Technologies, 6/24/10
McIlvaine Hot Topic Hour, Gas Turbine O&M, 7/22/10McIlvaine Hot Topic Hour, Industrial Boiler MACT – Impact and Control Options, March 10, 2011McIlvaine Hot Topic Hour, Fuel Impacts on SCR Catalysts, June 30, 2011.

Interest Rates, PDH P204, 3/9/12

Mechanics Liens, PDHOnline, 2/24/13.
Understanding Concerns with Dry Sorbent Injection as a Coal Plant Pollution Control, Webinar #874-567-839 by Cleanenergy.Org, March 4, 2013
Webinar: Coal-to-Gas Switching: What You Need to Know to Make the Investment, sponsored by PennWell Power Engineering Magazine, March 14, 2013. Available at: https://event.webcasts.com/viewer/event.jsp?ei=1013472.

EXHIBIT B

February 11, 2021

Ms. Kelilah D. Federman
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080

Subject: Comments on the Draft Environmental Impact Report for the Estrella Substation and Paso Robles Area Reinforcement Project

Dear Ms. Federman:

This letter contains my comments on the Draft Environmental Impact Report ("DEIR") prepared by the California Public Utilities Commission ("CPUC") for the Estrella Substation and Paso Robles Area Reinforcement Project ("Project" or "Proposed Project"). Horizon West Transmission, LLC and Pacific Gas and Electric Company (collectively referred to as the "Applicants") have proposed a project that involves construction and operation of a new 230 kilovolt (kV)/70 kV substation, a new 7-mile-long 70 kV power line, and replacement and reconductoring of approximately 3 miles of an existing 70 kV power line. The Proposed Project also would provide for the future establishment of three new distribution feeders from the proposed Estrella Substation, including construction of roughly 1.7 miles of new distribution line and additional reconductoring activities. All of these facilities would be located within the City of Paso Robles or immediately adjacent areas within unincorporated portions of San Luis Obispo County.

I am an environmental biologist with 28 years of professional experience in wildlife biology and natural resources management. I have served as a biological resources expert for over 125 projects in California. My experience and scope of work in this regard has included assisting various clients with evaluations of biological resource issues, reviewing environmental compliance documents prepared pursuant to the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA"), and submitting written comments in response to CEQA and NEPA documents. My work has included the preparation of written and oral testimony for the California Energy Commission, CPUC, and Federal courts. My educational background includes a B.S. in Resource Management from the University of California at Berkeley, and a M.S. in Wildlife and Fisheries Science from the Pennsylvania State University. A copy of my curriculum vitae is attached hereto.

The comments herein are based on my review of the environmental documents prepared for the Project, a review of scientific literature pertaining to biological resources known to occur in the Project area, consultations with other biological resource experts, and the knowledge and experience I have acquired during my 28-year career in the field of natural resources management.

PROJECT DESCRIPTION

The DEIR fails to provide a clear description of the vegetation management activities that would be implemented to comply with: (a) CPUC General Order ("G.O.") 95, and (b) PG&E and HWT wildfire mitigation plans (required under CPUC Code, Chapter 6, Section 8386). For example, the Project Description states:

> An approximately 10-foot radius (approximately 314 square feet) may be maintained around new 70 kV power poles depending on location and equipment installed as required by applicable law, including CPUC G.O. 95. Project proponents may, therefore, keep these areas clear of natural vegetation. Vegetation growing too close to conductors within the easement would be trimmed or removed for safety. Herbicides may be used for some vegetation maintenance activities.[1]

This description is too vague to understand the environmental impacts of the Project. The EIR needs to clearly articulate: (1) the vegetation management activities that would be conducted between power poles and the distance those activities would extend from the power lines (conductors); (2) the methods that would be used to remove, trim, or otherwise manipulate vegetation (e.g., masticators, chainsaws, loppers, etc.); (3) the herbicide products that may be used; (4) the frequency (return interval) of vegetation management activities (by vegetation community, if applicable); (5) the vegetation communities that may be manipulated to comply with G.O. 95; (6) whether the 10-foot radius would be limited to vegetation that grows within 10 horizontal feet of any conductor (as indicated on DEIR p. 4.4-53), or whether it also would include vegetation within 10 vertical feet; and (7) why numerous oak trees along the 70 kV route, but not within a 10-foot radius of the power poles, would be trimmed or removed.[2]

PGE's Wildfire Mitigation Plan states:

> In 2018, PG&E began a fuel reduction program, performing ground-to-conductor vegetative fuel reduction work (i.e. under and adjacent to power lines) in select locations. The goal of the fuel reduction work is to create "fire defense zones" which enhance defensible space for communities, properties, and buildings. These "fire defense zones" can also mitigate the spread of an ignition if one were to occur under or adjacent to PG&E powerlines. As such PG&E will continue to conduct fuel reduction work when appropriate, in select locations.[3]

Fuel reduction programs can cause significant environmental impacts that were not analyzed in the DEIR. For example, fuels reduction treatments in coastal scrub communities promote invasion by non-native plants and may cause type conversion (i.e., one vegetation type is converted into another vegetation type), especially if the treatments exceed the historical disturbance regime frequency.[4] Therefore, the CPUC and Applicants need to clarify whether a

[1] DEIR, p. 2-87.
[2] *See* DEIR, Figure 3-7.
[3] PG&E. 2020 Feb 28. 2020 Wildfire Mitigation Plan Report. p. 5-187.
[4] Keeley JE. 2006. Fire management impacts on invasive plants in the Western United States. Conservation Biology 20(2):375-384.

fuel reduction program would (or might) be implemented as part of the Project. If a fuel reduction program might be implemented as part of the Project, the EIR must disclose and analyze the environmental impacts of that program.

ENVIRONMENTAL SETTING

Golden Eagle

Project impacts have the potential to be especially severe on golden eagles due to the species': (a) intolerance of anthropogenic forms of disturbance, and (b) susceptibility to collision with, and electrocution from, power lines.[5] As result, robust information on golden eagle nest territories and important eagle-use areas[6] is critical to assessing impacts of the Proposed Project and various Project alternatives. According to the DEIR:

> Multiple active and inactive nests have been identified in the vicinity, including one near the Cava Robles RV Resort and several in the vicinity of the Alternative SE-PLR-2 alignment. Known golden eagle nests are shown in Figure 4.4-5. Expansive grasslands and open oak woodlands within and around the Proposed Project, reasonably foreseeable distribution components, and alternatives areas provide suitable hunting and nesting habitat for this species. Multiple sightings of golden eagles have been recorded within Paso Robles city limits between 1982 and 2015, with the closest observation to the project site being at Cuesta College North Campus just north of SR 46 (eBird 2020b). Horizon biologists also observed golden eagle individuals during March and July 2019 surveys (Horizon 2019a, 2019c).[7]

As described below, additional information is needed to evaluate the sufficiency of the DEIR's description of the environmental setting, and thus, the DEIR's impact assessment and proposed mitigation:

1. It appears the Applicants' biological resource consultant did not conduct protocol-level surveys for eagle nests.[8] Therefore, please identify the methods that were used to obtain information on golden eagle nests in the vicinity of the Proposed Project and Project alternatives.
2. DEIR Figure 4.4-5 does not distinguish between active and inactive nests. Therefore, please clarify whether Figure 4.4-5 depicts all active and inactive nests, or only the active nests.

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[5] U.S. Fish and Wildlife Service, Division of Migratory Bird Management. 2009. Final Environmental Assessment, Proposal to Permit Take as Provided Under the Bald and Golden Eagle Protection Act. Washington: Dept. of Interior. *See also* U.S. Fish and Wildlife Service. 2013 Apr. Eagle Conservation Plan Guidance: Module 1—Land-based Wind Energy, Ver 2. pp. ii and iii.

[6] Important eagle-use area is defined as: "an eagle nest, foraging area, or communal roost site that eagles rely on for breeding, sheltering, or feeding, and the landscape features surrounding such nest, foraging area, or roost site that are essential for the continued viability of the site for breeding, feeding, or sheltering eagles" (as defined at 50 CFR 22.3).

[7] DEIR, Table 4.4-1.

[8] *See* Pagel JE, Whittington DM, Allen GT. 2010 Feb. Interim Golden Eagle inventory and monitoring protocols; and other recommendations. Division of Migratory Birds, United States Fish and Wildlife Service.

3. It can be very difficult to classify the status of an eagle nest. In addition, many inactive nests become active nests in subsequent years. Therefore, please: (a) explain the methods that were used to confirm a nest was inactive, and (b) identify the year(s) each nest was last surveyed to determine its status.
4. California Natural Diversity Database ("CNDDB") staff often have a backlog of occurrence data that have not been entered into the database. This appears to be the case for golden eagle nest records. Therefore, please clarify whether the information provided in the DEIR includes unprocessed data that can be obtained by contacting CNDDB staff and the USFWS.
5. The eBird database has multiple records of golden eagles within the Paso Robles city limits between 2016 and 2020. Therefore, please clarify why the DEIR suggests there have not been sightings of golden eagles within the Paso Robles city limits since 2015.
6. The USFWS recommends surveys for occupied nesting territories within two miles of the area where take may occur.[9] Therefore, please provide information on any protocol-level eagle nest surveys that have been conducted within two miles of the Proposed Project and various Project alternatives.

PROJECT IMPACTS

Sensitive Natural Communities

The DEIR provides the following analysis of impacts to sensitive natural communities:

> The proposed Estrella Substation site is currently in agricultural production and there are no riparian habitats or sensitive natural communities within the site. The Proposed Project's 70 kV power line route, by contrast, would span several riparian corridors, including those along Huer Huero Creek and other unnamed ephemeral drainages in the area (see Figure 4.4-1). Additionally, three vegetation communities observed in the vicinity of the Proposed Project power line route (blue oak woodland, Central Coast cottonwood-willow riparian forest, and coastal and valley freshwater marsh) are considered sensitive communities under the City of Paso Robles General Plan (2011). Five vegetation communities (blue oak woodlands, central [Lucian] coastal scrub, Central Coast cottonwood-willow riparian forest, coastal and valley freshwater marsh, and sandy wash) are considered sensitive natural communities by CDFW.
>
> As described in Impact BIO-1, the Proposed Project has been designed to avoid all riparian habitats. APM HYDRO-1 requires that permanent structures, staging and work areas, and access roads be sited/routed through uplands and outside of existing drainage features to the extent feasible. Prior to construction, sensitive aquatic features slated for avoidance would be identified in the field and clearly marked. As a result, riparian areas would be avoided and no direct impacts to riparian areas would occur as a result of Proposed Project construction. Similarly, the Proposed Project has been designed to avoid central coastal scrub, Central Coast cottonwood-willow riparian forest, coastal and valley freshwater marsh, and sandy wash vegetation communities; however, up to 0.13

[9] U.S. Fish and Wildlife Service. 2020. Updated Eagle Nest Survey Protocol. Available at: <https://www.fws.gov/migratorybirds/pdf/management/EagleNestSurveyGuidanceUpdated.pdf>

> acre of direct permanent impacts to blue oak woodlands would occur as a result of pole and tower installation, vegetation removal, and clearing activities. This would include up to three oak trees that would need to be removed for Proposed Project construction. Further, approximately 6.41 acres of blue oak woodlands would be temporarily affected from construction activities. As described in Chapter 2, Project Description, all areas temporarily disturbed by the Proposed Project would be restored to the extent practicable, following construction.[10]

The 70 kV power line would cross a number of drainage features[11] that qualify as "riparian areas."[12] The DEIR points to APM HYDRO-1 to justify the statement that: "riparian areas would be avoided and no direct impacts to riparian areas would occur as a result of Proposed Project construction."[13] However, APM HYDRO-1 only requires that permanent structures, staging and work areas, and access roads be sited outside of existing drainage features *to the extent feasible*. The DEIR does not discuss factors that would make it infeasible to avoid impacts to riparian areas, nor does it explain why it was impractical for the CPUC to conduct the feasibility analysis prior to publication of the DEIR. Because avoidance of riparian areas is contingent on an undefined level of feasibility, it is impossible for the public to understand the likelihood that Project impacts to riparian areas would indeed be avoided. Similarly, because the DEIR does not discuss factors that would make restoration impracticable, it is impossible for the public to understand the likelihood that ecological functions within temporary impact areas would indeed be restored. This issue is compounded by the lack of ecological performance standards for restoration of habitats in temporary impact areas (except those containing blue oak woodland).

Blue Oak Woodland

The DEIR states: "up to 0.13 acre of direct permanent impacts to blue oak woodlands would occur as a result of pole and tower installation, vegetation removal, and clearing activities. This would include up to three oak trees that would need to be removed for Proposed Project construction. Further, approximately 6.41 acres of blue oak woodlands would be temporarily affected from construction activities."[14] The DEIR's statement that permanent impacts to oak trees would be limited to removal of "up to three oak trees" does not appear to be accurate for several reasons. First, it is inconsistent with DEIR Figure 3-7, which depicts numerous locations along the reconductoring segment that would require "oak tree trimming/removal."[15] This suggests the Applicants have yet to determine how many oak trees require removal. Second, it does not appear to account for tree removal activities associated with implementation of G.O. 95. Third, it does not appear to account for tree removal or mortality in the Project's "temporary" impact areas. According to DEIR:

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[10] DEIR, p. 4.4-51.
[11] DEIR, p. 4.4-53.
[12] Riparian areas in the Project area are not limited to the Central Coast cottonwood-willow riparian forest vegetation community discussed in the DEIR. *See definition in* National Research Council 2002. Riparian Areas: Functions and Strategies for Management. Washington, DC: The National Academies Press. p. 3.
[13] DEIR, p. 4.4-51.
[14] *Ibid*.
[15] It is unclear if the proposed alignment (and MRV) for the 70-kV route between the Estrella Substation and North River Road would require additional trimming/removal of oak trees because unlike the detailed maps of the Project alternatives, the detailed map of the Proposed Project does not depict locations requiring oak tree trimming/removal.

> Proposed Project construction would require establishment of temporary staging areas, structure work areas, conductor pull and tension sites, and helicopter landing areas. Construction of temporary access roads also would be required. The range of site preparation for these areas would include site leveling and grading, fencing, placement of gravel, vegetation removal, tree trimming/removal and/or vine removal, and placement of temporary rock bedding.[16]

The DEIR fails to analyze how these construction activities would affect oak trees and the long-term viability of the blue oak woodland. Oak trees are extremely sensitive to disturbance activities within the root zone, which is approximately one third greater than the distance between the tree and the outermost edge of the tree's foliage (e.g., if the tree's foliage extends 30 feet, the root zone extends 40 feet).[17] Any construction activities that occur in the root zone have the potential to kill the oak tree.[18] This includes grading, trenching, soil compaction, deposition of gravel or rock, and potentially other construction activities in the "temporary" work areas.[19] In addition, any construction activities that causes changes in soil moisture levels or drainage around an oak can kill the tree.[20] The temporary construction activities described in the DEIR are likely to cause permanent impacts to oak trees and the associated oak woodland community, especially in absence of: (a) mitigation to protect the root zone and existing soil properties, and (b) performance standards for survival of oak trees within temporary impact areas.

To facilitate proper understanding of the Project's impacts, the CPUC needs to: (1) provide maps that depict the oaks and oak woodland habitat that would be permanently impacted by the Project; (2) identify and map the specific Project activities that would temporarily impact 6.41 acres of blue oak woodlands; (3) explain the rationale for classifying the impacts as temporary; (4) clarify the maximum number of oak trees that might be removed as a result of the Project; and (5) clarify the extent of impacts associated with implementation of G.O. 95 (and any other vegetation management activities designed to reduce the wildfire risk).

Special-Status Wildlife Habitat

The DEIR states:

> Construction of the proposed Estrella Substation and the 70 kV power line would involve vegetation clearing, excavation, grading, and related ground-disturbing activities. Additionally, access roads would be improved and/or established to allow for access to work areas. Helicopters would be used for a variety of tasks during the construction period and approximately 6 helicopter landing zones would be established and utilized in the Proposed Project area. These activities would have potential to impact special-status species both directly (e.g., crushing from mechanical equipment) and indirectly (e.g., habitat degradation, water quality impacts, etc.).[21]

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[16] DEIR, p. ES-6.
[17] University of California Integrated Hardwood Range Management Program. 2010. Living Among the Oaks: A Management Guide for Landowners. Division of Agriculture and Natural Resources Publication #21538.
[18] *Ibid.*
[19] *Ibid.*
[20] *Ibid.*
[21] DEIR, p. 4.4-40.

The DEIR provides an estimate of the Project's impacts to blue oak woodlands and it states that impacts to other sensitive natural communities would be avoided. However, the DEIR fails to quantify the extent of Project impacts to other habitat types in the Project area (e.g., grassland, agricultural, ruderal). This precludes the ability to understand the severity of the Project's direct and indirect impacts on special-status species associated with those habitat types.

Crotch's Bumble Bee

The DEIR provides the following rationale for the CPUC's conclusion that Project impacts to the Crotch's bumble bee would be less than significant:

> Pre-construction surveys required under APM BIO-1 and Mitigation Measure BIO-1 would identify Crotch's bumble bee individuals or nests that could be present within the Proposed Project footprint. Additionally, implementation of APMs BIO-3 and GEN-1 would further reduce potential for any impacts to Crotch's bumble bee during construction. As a State candidate endangered species, the Applicants would be required to notify and coordinate with CDFW regarding any Crotch's bumble bee nests or individuals identified during pre-construction surveys or during the course of construction activities. If necessary, the Applicants may be required to obtain regulatory approval to relocate the nest. Given implementation of these measures, impacts to special-status invertebrates during construction would be less than significant with mitigation.[22]

Crotch's bumble bees typically construct nests underground.[23] The DEIR fails to provide evidence that Crotch's bumble bee nests can be successfully relocated. It also fails to explain how notifying and coordinating with CDFW would reduce impacts to less than significant levels. As a result, potentially significant impacts to the Crotch's bumble bee remain unmitigated.

Golden Eagle (and other Special-Status Birds)

The DEIR recognizes the Project poses an electrocution and collision hazard to birds, and that bird injuries and fatalities are a potentially significant impact.[24] The DEIR then states that the impact would be mitigated to a less than significant level because:

1. The conductors would be specular (i.e., shiny) and more visible to birds upon initial installation, allowing them time to adjust to the new facilities.
2. The Applicants would implement the avian protection measures outlined in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006), which include solutions such as spacing phase conductors (e.g., greater than the width of birds' wingspans) such that electrocution hazards are minimized.
3. Mitigation Measure BIO-3 also would be implemented, which would require that the Applicants incorporate guidance in *Reducing Avian Collisions with Power Lines: State of the Art in 2012* (APLIC 2012) and develop an Avian Protection Plan.

[22] DEIR, p. 4.4-42.
[23] DEIR, Table 4.4-1.
[24] DEIR, pp. 4.4-49 and -50.

4. The Applicants would implement a minor route variation ("MRV") prior to construction to avoid a potential golden eagle nest along Huer Huero Creek at Union Road if this nest is determined to be occupied or is expected to be used by golden eagles in future nesting seasons (based on prior observations and the species' nest site fidelity).[25]

As discussed below, these measures do not ensure avian collisions and electrocutions are mitigated to less than significant levels.

Specular Conductors

The DEIR provides no evidence that specular conductors reduce avian collisions, nor could I find any evidence in the scientific literature. Even if specular conductors reduce avian collisions, their efficacy as a mitigation measure would be short-lived because the conductors become less shiny in the course of a few seasons after installation.[26]

Avian Protection Plan

The DEIR fails to explain how the Avian Protection Plan ("APP") would help mitigate impacts to less than significant levels. Development of an APP in itself does not reduce avian collisions and electrocutions. The only information the DEIR provides regarding the APP is that it would incorporate "relevant project-specific guidelines found in APLIC's and USFWS' 2005 Avian Protection Plan Guidelines." In this case, it is impossible to assess the value of the APP in reducing avian fatalities because the DEIR does not provide a draft of the APP, nor does it identify the specific guidelines that the Applicants and CPUC consider to be "relevant" to the Project.

The DEIR states: "[a]s part of the Avian Protection Plan development, HWT and PG&E shall work with USFWS to determine the need for installation of bird diverters in areas near known golden and bald eagle nests."[27] The DEIR does not discuss the efficacy of bird diverters in reducing eagle collisions with power lines. However, bird diverters do not eliminate power line collisions; a considerable amount of mortality still occurs at lines with bird diverters. Barrientos et al. (2012) conducted the largest worldwide experiment to date on the effectiveness of bird diverters.[28] The researchers reported: "[w]e observed a small (9.6%) but significant decrease in the number of casualties after line marking [with diverters] compared to before line marking in experimental lines. This was not observed in control lines."[29] Thus, bird diverters resulted in a statistically significant reduction in avian mortalities, but the total number of avian mortalities at lines with diverters was still biologically significant.[30] In addition, the researchers noted that bird diverters were ineffective for many species, especially species that have high collision risks.

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[25] DEIR, p. 4.4-50.
[26] DEIR, p. 2-54.
[27] DEIR, pp. 4.4-50 and -51.
[28] Barrientos R, Ponce C, Palacin C, Martin CA, Martin B, Alonso JC. 2012. Wire Marking Results in a Small but Significant Reduction in Avian Mortality at Power Lines: A BACI Designed Study. PLoS ONE 7(3):e32569.
[29] *Ibid.*
[30] *Ibid. See also* Savereno AJ, Savereno LA, Boettcher R, Haig SM. 1996. Avian Behavior and Mortality at Power Lines in Coastal South Carolina. Wildlife Society Bulletin 24(4):636-648.

One reason bird diverters may not be effective for golden eagles is that golden eagles are adapted to flying in open airspace clear of hazards. Because golden eagles attack prey from above, their vision during flight is usually directed at the ground where prey are located—not at the airspace ahead of them where foreign hazards (with or without bird diverters) might be located.

Minor Route Variation (MRV)

According to the DEIR: "the Applicants would implement an MRV prior to construction to avoid a potential golden eagle nest along Huer Huero Creek at Union Road if this nest is determined to be occupied or is expected to be used by golden eagles in future nesting seasons (based on prior observations and the species' nest site fidelity)."[31] The criteria that would trigger the MRV are vague. Specifically, the DEIR fails to explain how "prior observations and the species' nest site fidelity" would be evaluated to determine whether the nest "is expected to be used by golden eagles in future nesting seasons," and thus, whether an MRV is needed. Furthermore, if the decision to implement an MRV would be based on "prior observations," there is no need for the CPUC to defer decision on the MRV until after CEQA review of the Project.

Most golden eagle territories have up to six nests, although eggs are laid in only one of the nests during a given year (unless the initial nesting attempt fails).[32] The territorial pair is likely to alternate nest sites among years, and they may add new material to alternative nests they do not use during a given nesting season.[33] Scientific literature indicates alternative nests are biologically significant, and that it is very likely the nest along Huer Huero Creek will be re-used for nesting at some time in the future.[34] Therefore, reducing the potential for significant impacts to golden eagles requires an MRV, regardless of whether eagles occupy the nest prior to Project construction.[35]

The DEIR does not explain how the proposed MRV would reduce impacts on golden eagles. The MRV involves shifting a portion of the 70-kV route slightly north, such that it would be located adjacent to a relatively isolated and dense strip of oak woodland (Figure 1). The trees in the woodland provide perches for golden eagles, and they may contain alternative nests. Whereas the MRV may reduce the potential for construction related impacts (e.g., due to noise and human activity near the nest site), installing the power lines immediately adjacent to the woodland is likely to increase the potential for operations related impacts because it would place power lines in close proximity to an attractive habitat feature, thus increasing the risk of collisions (e.g., as eagles approach or depart perches or nests in the woodland).

[31] DEIR, p. 4.4-50.
[32] Pagel JE, Whittington DM, Allen GT. 2010 Feb. Interim Golden Eagle inventory and monitoring protocols; and other recommendations. Division of Migratory Birds, United States Fish and Wildlife Service.
[33] Millsap BA, Grubb TG, Murphy RK, Swem T, Watson JW. 2015. Conservation significance of alternative nests of golden eagles. Global Ecology and Conservation 3:234-241.
[34] *Ibid*.
[35] *See* DEIR, p. 2-16: "[t]his MRV would only be implemented if a possible golden eagle nest along Huer Huero Creek in this location is confirmed to have eagles present prior to Project construction."

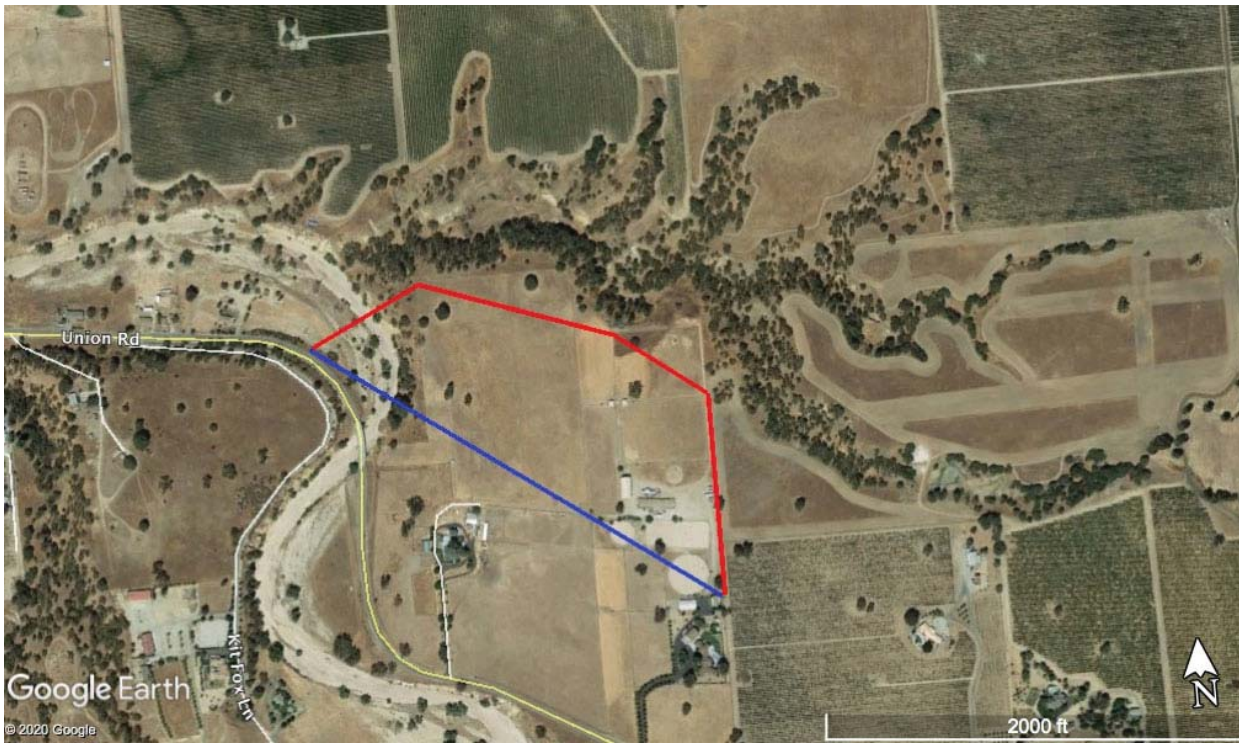

Figure 1. Approximate location of proposed MRV (red line) in relation to the proposed route (blue line). Although the MRV would increase the distance between the power line and the golden eagle nest along Huer Huero Creek, it would place the power line in close proximity to perch (and potentially nest) sites in the oak woodland.

APLIC Guidelines

Implementation of the avian protection measures outlined in the APLIC guidelines (2006 and 2012) is a valuable mitigation measure. However, implementation of the APLIC guidelines would not eliminate the potential for avian collisions and electrocutions.[36] This is especially true for the Project's steel structures, because utility structures made of steel are self-grounded and require just one contact with an energized conductor to be lethal.[37]

Electrocution from, and collision with, power lines is one of the leading causes of golden eagle mortality.[38] The golden eagle population is extremely sensitive to additive mortality because: (a) golden eagles occur at very low densities, (b) a relatively high percentage of juveniles do not survive to breeding age (typically the 4th or 5th year of life), and (c) the population is already

[36] Lehman RN, Savage JA, Kennedy PL. Harness RE. 2010. Raptor Electrocution Rates for a Utility in the Intermountain Western United States. Journal of Wildlife Management 74(3):459-470. *See also* APLIC 2006 and APLIC 2012.

[37] *Ibid. See also* Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute and APLIC. Washington, D.C. pp. 81 and 82.

[38] U.S. Fish and Wildlife Service, Division of Migratory Bird Management. 2009. Final Environmental Assessment, Proposal to Permit Take as Provided Under the Bald and Golden Eagle Protection Act. Washington: Dept. of Interior. *See also* Avian Power Line Interaction Committee (APLIC). 2018. Eagle Risk Framework: A Practical Approach for Power Lines. Edison Electric Institute and APLIC. Washington, DC. p. 4.

declining.[39] For these reasons, the USFWS has determined that the golden eagle population cannot withstand *any* additional level of take.[40] Consequently, death (or injury) of even one golden eagle due to the Project would constitute a significant impact under CEQA. In addition, any Project-related take of a golden eagle would violate the Bald and Golden Eagle Protection Act if the Applicants do not first obtain an eagle take permit from the U.S. Fish and Wildlife Service. The DEIR does not require the Applicants to obtain an eagle take permit, nor does it suggest the Applicants intend to apply for one.

The DEIR fails to disclose or analyze how many eagles the Project might kill (or injure) even after implementation of the MRV, APLIC guidelines, and other mitigation measures proposed in the DEIR. In addition, the DEIR does not require fatality monitoring, nor does it require remedial actions (e.g., compensatory mitigation) if eagle fatalities are incidentally discovered. For these reasons, Project impacts on the golden eagle remain potentially significant.

The DEIR indicates undergrounding the Project's power lines would reduce impacts to special-status birds by reducing the potential for avian collision and electrocutions.[41] In addition, the DEIR indicates undergrounding would substantially reduce the wildfire risk and associated ecological consequences.[42] Nevertheless, the DEIR's analysis of undergrounding is limited to Alternative PLR-3, which would involve undergrounding a relatively short segment of the power line route in the Golden Hill Road area north of SR 46. The DEIR provides the following rationale for Alternative PLR-3:

> Alternative PLR-3: Strategic Undergrounding would involve undergrounding the portion of the Proposed Project's new 70 kV power line which has the greatest potential for aesthetic and other environmental impacts. During scoping for the Proposed Project, and based on CPUC staff and consultant's preliminary analysis of the Proposed Project's potential impacts, it was determined that the portion of the line that passes through the Golden Hill Road area north of SR 46 had the greatest potential for impacts because this area does not have existing aboveground transmission or distribution electrical infrastructure and is an up-and-coming area with new commercial development, recreational uses, and existing single-family residential development.[43]

The benefits of Alternative PLR-3 in reducing the risks of wildfire and avian impacts would be relatively limited because the majority of the Proposed Project's 70-kV route would be above ground, including in areas that currently do not have existing aboveground transmission or distribution electrical infrastructure. The DEIR provides no evidence that the risks of wildfire and avian impacts are greater in the Golden Hill Road area north of SR 46 relative to other portions of the Proposed Project's 70-kV route. Therefore, if the objective of undergrounding is to reduce "aesthetic and other environmental impacts," the CPUC needs to analyze a Project alternative that involves undergrounding the 70-kV power line along its entire route.

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[39] *Ibid.*
[40] U.S. Fish and Wildlife Service. 2016. Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update. Division of Migratory Bird Management, Washington D.C., USA.
[41] DEIR, Table 5-1.
[42] DEIR, p. 4.20-18.
[43] DEIR, p. 3-74.

Amphibians

The DEIR provides the following analysis of Project impacts to the California red-legged frog ("CRLF") and western spadefoot toad:

> As discussed above, the Proposed Project has been designed to avoid sensitive aquatic features, which would include any features that would provide suitable aquatic breeding and aquatic non-breeding habitat for these species. Nevertheless, there would be potential for direct significant impacts to CRLF and western spadefoot toad if individuals were present in upland areas where Proposed Project construction activities would occur….Implementation of APM BIO-1 and Mitigation Measure BIO-1 would reduce potential for undetected western spadefoot toad or CRLF individuals in Proposed Project areas to be directly impacted at the start of construction. Likewise, monitoring of initial ground-disturbing activities under APM BIO-3 and Mitigation Measure BIO-1 (through pre-construction surveys, biological monitoring, the monitor's stop-work authority, and exclusion fencing) would ensure that CRLF and western spadefoot toad individuals are not present during these activities, such that they could be directly impacted. Implementation of the WEAP under APM GEN-1 also would minimize potential for adverse direct impacts to special-status amphibians. Further, APM BIO-4 and Mitigation Measure BIO-1 would require that all trenches and excavations in excess of 2 feet deep have a sloped escape ramp or be covered at the end of the day, which would minimize potential for CRLF or western spadefoot toad individuals to become entrapped in Proposed Project construction areas.[44]

Western spadefoot toads spend the majority of the year below ground and are only detectable during a few weeks (or months) of the year.[45] CRLF that disperse from aquatic habitat seek shelter under objects (e.g., rocks, logs) or in small mammal burrows.[46] Terrestrial movements of both species generally occur at night.[47] As a result, detection of western spadefoot and CRLF requires special survey techniques. APM BIO-1 and Mitigation Measure BIO-1 do not require those survey techniques.[48]

The biological monitoring required under APM BIO-3 assumes CRLF and western spadefoot would be visible to the biological monitor. This is not a valid assumption because terrestrial (aboveground) movements of CRLF and western spadefoot occur at night, whereas construction would occur during the day. The DEIR references exclusion fencing as one of the measures that would ensure CRLF and western spadefoot toad individuals are not present during construction activities. However, neither APM BIO-3 nor Mitigation Measure BIO-1 requires installation of an exclusion fence around construction work areas. For these reasons, there is no basis for the

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[44] DEIR, p. 4.4-43.
[45] U.S. Fish and Wildlife Service. 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. U.S. Fish and Wildlife Service, Portland, Oregon. pp. II-220 through -235.
[46] U.S. Fish and Wildlife Service. 2002. Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregon. p. 14.
[47] U.S. Fish and Wildlife Service. 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. U.S. Fish and Wildlife Service, Portland, Oregon. pp. II-220 through -235. *See also* Fellers GM, Kleeman PM. 2006. Diurnal versus Nocturnal Surveys for California Red-Legged Frogs. Journal of Wildlife Management 70(6):1805-1808.
[48] The USFWS has issued a survey protocol for the CRLF. *See* U.S. Fish and Wildlife Service. 2005 Aug. Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog. 26 pp.

DEIR's claim that APM BIO-3 and Mitigation Measure BIO-1 "would ensure that CRLF and western spadefoot toad individuals are not present during these activities, such that they could be directly impacted."

The CRLF and western spadefoot are small animals. Therefore, the threat that trenches pose to these species (and other amphibians) is not limited to trenches in excess of 2 feet deep. Although the measures required under APM BIO-4 and Mitigation Measure BIO-1 would reduce mortality associated with trenches, mortality may still occur, especially if mitigation is limited to escape ramps (i.e., trenches are not covered) as allowed under APM BIO-4 and Mitigation Measure BIO-1.[49] Whereas inspecting the trenches at the beginning of the workday would be effective for CRLF, it would not be effective for western spadefoots, which burrow under soil during the day.[50]

Invasive Plants

Invasive plants threaten native diversity, alter ecosystem processes,[51] and can cause extinction of native species.[52] Indeed, next to habitat loss, invasive species pose the greatest threat to the nation's biodiversity and natural resources.[53] Three things are required for an invasive plant to become established in an area:

1. A vector for transporting the plant or its propagules from one place to another. Some vectors are natural (e.g., wind, water, and wildlife); however, most are related to human activities. Tools, equipment, vehicles, livestock, clothing, and boots are potential vectors for the spread of invasive plants.
2. Suitable conditions for invasive plant colonization. Soil and vegetation disturbance create suitable conditions for the establishment of invasive plants.
3. A suitable environment for the invasive plant to survive, reproduce, and spread. Many invasive species possess a competitive advantage over native species in an area. As a result, invasive species can reproduce and spread exponentially, especially if the ecosystem lacks a mechanism for keeping them in check.[54]

The Project has the potential to facilitate the colonization and spread of invasive plants because construction and operation activities: (a) provide vectors for transporting invasive plant

[49] Doody JS, West P, Stapley J, et al. 2003. Fauna by-catch in pipeline trenches: conservation, animal ethics, and current practices in Australia. Australian Zoologist 32(3):410-419.
[50] U.S. Fish and Wildlife Service. 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. U.S. Fish and Wildlife Service, Portland, Oregon. pp. II-220 through -235.
[51] Vitousek P. 1990. Biological invasions and ecosystem processes: towards an integration of population biology and ecosystem studies. Oikos 57:7–13. *See also* Theoharides KA, Dukes JS. 2007. Plant invasion across space and time: factors affecting nonindigenous species success during four stages of invasion. New Phytologist 176:256-273.
[52] Gurevitch J, Padilla DK. 2004. Are invasive species a major cause of extinctions? Trends in Ecology and Evolution 19(9):470-474.
[53] U.S. Department of the Interior, Office of Congressional and Legislative Affairs. 2013. Invasive Species Management. Statement for the Record: U.S. Department of the Interior Before the House Natural Resources Subcommittee on Public Lands and Environmental Regulation's oversight hearing on "Invasive Species Management on Federal Lands."
[54] California Department of Food and Agriculture, California Invasive Weed Awareness Coalition. 2005. California Noxious & Invasive Weed Action Plan. California Dept. of Food and Agriculture, Sacramento, CA.

propagules, (b) involve soil and vegetation disturbance, and (c) would be conducted in an environment susceptible to invasion.[55] The DEIR does not disclose this issue, nor does it provide any analysis of potentially significant impacts that could occur as the result of Project activities that facilitate the colonization or spread of invasive plants.

Cumulative Impacts

According to the DEIR:

1. The Project would result in significant impacts on a suite of sensitive biological resources.[56]
2. Impacts from the Proposed Project (and all alternatives), in combination with impacts from other projects, would result in a significant cumulative impact on biological resources.[57]
3. There is potential for the Project to have a cumulatively considerable incremental contribution to the significant cumulative impact.[58]

Despite these determinations, the DEIR concludes: "the Proposed Project, reasonably foreseeable distribution components, and alternatives would not make a cumulatively considerable contribution to this significant cumulative impact. The contribution of the Proposed Project, reasonably foreseeable distribution components, and alternatives cumulative impact would be less than significant with mitigation."[59] The CPUC's rationale for this conclusion is that: (a) the Project's significant impacts would be reduced to a less-than-significant level with implementation of the APMs and mitigation measures identified in Section 4.4 of the DEIR; and (b) these measures would ensure that impacts on protected species, communities, and habitats are reduced to a level that would protect their continued existence.[60] The CPUC's rationale is flawed because the APMs and mitigation measures are designed to reduce significant impacts, not eliminate the impacts entirely. Thus, there would be residual impacts. For example, because the DEIR's compensatory habitat requirement is limited to impacts to blue oak woodland, there would be residual impacts to special-status species associated with grasslands and agricultural lands.[61] Similarly, there could be residual impacts on the golden eagle and other special-status birds because the DEIR does not require compensatory mitigation for fatalities caused by electrocutions and collisions with the new power line facilities. Whereas these residual impacts may not rise to the level of significance at the Project level, they may be significant at the cumulative level when combined with the residual impacts of other projects. For example, the DEIR notes that the impact on avian fatalities would not be limited to the Project, but rather, that the Project would incrementally increase a fatality risk that already exists in the area.[62] The

[55] The cumulative impacts section of the DEIR (pp. 6-6 and -7) identifies "introduction of nonnative plant and animal species" as one of the past and present actions that has most strongly influenced existing conditions in the Project area.
[56] DEIR, p. 6-22.
[57] *Ibid*.
[58] DEIR, Table 6-3.
[59] DEIR, p. 6-22.
[60] *Ibid*.
[61] *See* DEIR, Table 4.4-1.
[62] DEIR, p. 4.4-50.

Project's contribution to this potentially significant cumulative impact is cumulatively considerable because it would place seven miles of new power lines in an area that supports foraging raptors, and that has multiple golden eagle nests.[63]

According to CEQA Guidelines § 15130(a)(3):

> An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. The lead agency shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.

In this case, none of the DEIR's biological resource mitigation measures are designed to alleviate the cumulative impact; they are all specific to the Proposed Project and Project alternatives. Therefore, they do not address potentially significant cumulative impacts, and the CPUC has no basis for its conclusion that the Project's contribution to those cumulative impacts would be less than cumulatively considerable.

MITIGATION ISSUES

APM BIO-1 and MM BIO-1 (Special-Status Animal Species)

The mitigation strategy proposed in Mitigation Measure ("MM") BIO-1 and APM BIO-1 consists of: (a) pre-construction surveys prior to initial vegetation clearance, grubbing, and ground-disturbing activities; (b) a pre-construction survey report that is submitted to the CPUC for review and approval; and (c) delineation of habitat that must be avoided. These measures do not mitigate potentially significant impacts to special-status animals for the following reasons:

First, the DEIR fails to establish standards for the pre-construction survey methods to ensure they are adequate for detection of special-status animals. Many of the special-status species that have the potential to occur in the Project area require special survey techniques (e.g., live-trapping for Salinas pocket mouse, raking the substrate for legless lizards, aerial surveys for eagle nests). In addition, some species are generally only detected at night (e.g., bats, western spadefoot), or require multiple, protocol-level surveys to acquire reliable information on their presence.[64] MM BIO-1 fails to require the survey methods necessary for detection of special-status animal species; the only standards it establishes are that the surveys be conducted by an approved biologist no earlier than 30 days prior to surface disturbance. This issue is exacerbated by the DEIR's failure to establish standards for the survey area. For example, although the DEIR states that the standard buffer distance for golden eagle nests is 2,640 feet, MM BIO-1 does not require pre-construction surveys that extend 2,640 feet from Project work areas.

[63] DEIR, Table 4.4-1.

[64] The USFWS and CDFW have issued survey protocols for the following species that may occur in the Project area: vernal pool fairy shrimp, California red-legged frog, golden eagle, burrowing owl, Swainson's hawk, and San Joaquin kit fox. Scientific organizations have issued survey protocols for legless lizards, bats, American badger, tricolored blackbird, and other bird species.

Second, some of the special-status species that have the potential to occur in the Project area are only detectable during certain times of year (e.g., Crotch's bumble bee, western spadefoot, Swainson's hawk). Surveys that are limited to "no earlier than 30 days prior to surface disturbance" fail to account for these species and could cause false-negative survey results, which in turn could result in significant impacts. For example, western spadefoots are only detectable at night shortly after rains in the winter and spring; at all other times they are completely surrounded by soil in underground burrows (which are undetectable to humans).[65] As a result, pre-construction surveys in August (for example) would fail to reveal any evidence of the species, when in fact there might be hundreds of spadefoots buried in the soil. Because spadefoots burrow in sandy or gravelly soils, they would be susceptible to being crushed or entombed by soil compaction caused by Project vehicles or machinery.[66]

Third, the DEIR fails to ensure adequate mitigation for special-status that are detected during the pre-construction survey. According to the DEIR, buffers would installed around bird nests. However, mitigation for all other terrestrial wildlife species has be deferred to the pre-construction survey report, which would identify the "anticipated impacts and proposed mitigation."[67] This approach does not comply with CEQA, which prohibits deferral of: (a) the impact assessment; and (b) the mitigation (unless the lead agency establishes specific performance criteria for the mitigation and explains why it was impractical for the lead agency to identify the mitigation in the EIR).

MM BIO-1 states: "[s]ensitive habitat areas, plus a minimum 5-foot buffer for wetlands and waters of the U.S., that will be avoided by construction shall be fenced with orange safety fencing."[68] There are two problems with this measure. First, the DEIR identifies wetlands and blue oak woodlands as sensitive habitats.[69] However, it fails to identify the criteria that would be used to define "sensitive habitat areas." Many of the special-status species that have the potential to occur in the Project area are associated with grasslands or special habitat elements (e.g., burrows). As a result, sensitive habitat areas are not equivalent to sensitive natural communities.

Second, a 5-foot buffer around wetlands waters of the U.S. would not be sufficient to avoid impacts to species associated with wetlands and other aquatic habitat types. Special-status species associated with wetlands (and other aquatic habitat types) in the Project area include the California red-legged frog, western spadefoot, western pond turtle, tricolored blackbird, and yellow warbler. These species use terrestrial habitats that extend well beyond the 5-foot buffer proposed in MM BIO-1. For example, western pond turtles use terrestrial habitat for nesting, resting, refuge, and overland dispersal.[70] Rathbun et al. (2002) examined the distances pond turtles moved away from aquatic habitat for refuge, nesting, and resting. Mean maximum travel

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[65] U.S. Fish and Wildlife Service. 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. U.S. Fish and Wildlife Service, Portland, Oregon. pp. II-220 through -235.
[66] *Ibid.*
[67] DEIR, p. 4.4-47.
[68] *Ibid.*
[69] *Ibid.*
[70] Rathbun GB, Scott NJ Jr, Murphey TG. 2002. Terrestrial Habitat Use by Pacific Pond Turtles in a Mediterranean Climate. Southwestern Naturalist 47(2): 225-235. *See also* Jennings MR, Hayes MP. 1994. Amphibian and Reptile Species of Special Concern in California. Final Report to the California Department of Fish and Game.

distances were 49.7 meters, 93.7 meters, and 12.0 meters, respectively.[71] However, western pond turtles have been reported ranging as far as 500 meters (1,640 feet) from a watercourse to find suitable nesting habitat.[72] Nests are typically located in open, grassy areas,[73] such as those that occur in the Project area.

Mitigation for Impacts to Habitat

The DEIR requires compensatory mitigation for the Project's permanent impacts on blue oak woodland. However, it does not require compensatory mitigation for the Project's permanent impacts on other habitat types that support special-status species.

The DEIR states:

> All areas temporarily disturbed by the Project would be restored to the extent practicable, following construction. These disturbed areas include staging areas and access roads, work areas around each tower/pole, and the areas used for conductor stringing and staging. Postconstruction restoration activities would include returning areas to their original contours and drainage patterns in accordance with stormwater pollution prevention plan best management practices and as prearranged through landowner agreements, where applicable.[74]

The DEIR fails to incorporate restoration of temporarily disturbed areas as an enforceable mitigation measure. Furthermore, the DEIR fails to establish performance standards or monitoring requirements for the restoration efforts. For these reasons, the Project's impacts on habitat for special-status animals remain potentially significant.

APM BIO-4 (Special-Status Species Protection)

Open pipes pose a mortality hazard to wildlife. Birds, small mammals, and reptiles enter the pipes to nest or find shelter, but the smooth interior and tight confines of the pipes prevent individuals from escaping, leading to death. The DEIR identifies open pipes (or conduit) as a potentially significant mortality hazard to birds.[75] APM BIO-4 is designed to mitigate the potentially significant impact. APM BIO-4 states: "open-ended project-related pipes 4 inches or greater in diameter will be capped if left overnight or inspected for wildlife prior to being moved." The mortality hazard associated with open pipes is not limited to pipes 4 inches or

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[71] *Ibid.*

[72] Reese DA, Welsh HH Jr. 1997. Use of Terrestrial Habitat by Western Pond Turtles, Clemmys marmorata: Implications for Management. Pp. 352-357. In J. Van Abbema (ed.), Conservation, Restoration, and Management of Tortoises and Turtles, An International Conference WCS Turtle Recovery Program and the New York Turtle and Tortoise Society, New York.

[73] Holland DC. 1994. The Western Pond Turtle: Habitat and History. Final Report. Portland, OR: U.S. Department of Energy, Bonneville Power Administration. *See also* Ernst CH, Lovich JE. 2009. Turtles of the United States and Canada. Second edition. Johns Hopkins University Press. 827 pp.

[74] DEIR, p. 2-86.

[75] DEIR, p. 4.4-44.

greater in diameter.[76] As a result, APM BIO-4 does not ensure avoidance of potentially significant levels of mortality associated with open pipes.

MM BIO-2 (Special-Status Plants)

MM BIO-2 states:

> If avoidance of special-status plants is not feasible, HWT and PG&E shall implement measures to compensate for impacts to special-status plants. Compensation may be provided by purchasing credits at a CDFW-approved mitigation bank (provided at a minimum 1:1 ratio [mitigation to impact]), or through transplanting perennial species and collecting and dispersing seed of annual species (i.e., salvage and relocation) under the direction of CDFW. Where salvage and relocation is demonstrated to be feasible and biologically preferred by the CDFW, it shall be conducted pursuant to a CPUC- and CDFW-approved salvage and relocation plan that details the methods for salvage, stockpiling, and replanting, as well as the characteristics of the receiver sites.

There do not appear to be any CDFW-approved mitigation banks in San Luis Obispo County (or surrounding counties) that sell credits for special-status plants.[77] Therefore, compensation for impacts to special-status plants would require the "salvage and relocation" option. MM BIO-2 does not provide any information on potential mitigation (receiver) sites, nor does it establish criteria for their selection (e.g., geographic location, history of land use, management scheme). This is important because relocating plants to a non-local ecotype may cause significant ecological impacts (e.g., genetic contamination) at the receptor site.[78] Even if plants are relocated to a local ecotype, their long-term viability will depend on the specific characteristics (e.g., soils, topography, adjacent land uses) of the receptor site. In addition to failing to establish selection criteria for the mitigation site, the DEIR fails to establish: (a) a mechanism (e.g., conservation easement) that would ensure the mitigation site is protected in perpetuity after the 5-year monitoring period terminates, (b) a funding mechanism (e.g., endowment), and (c) a management mechanism (e.g., management plan and authority) that ensures the mitigation site is appropriately managed in perpetuity to maintain viability of the special-status plants.

It is unclear whether the 1:1 mitigation ratio proposed in MM BIO-2 would be based on acreage impacted or number of plants impacted. While the DEIR's initial reference to the 1:1 ratio suggests it would be based on acreage, the DEIR's proposed success criteria suggest it would be based on the number of plants.

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[76] Harris M, Clucas B, Stanek J, Whitfield M. 2019. Wildlife Mortalities in Open-Topped Pipes in Central California. Western Wildlife 6:50–60. *See also* American Bird Conservancy. 2014. More Evidence That Open Pipes Kill Birds in the West. Bluebird 37(1):12.

[77] California Department of Fish and Wildlife. 2021. Conservation and Mitigation Banks Established in California by CDFW [webpage]. Available at: <https://wildlife.ca.gov/conservation/planning/banking/approved-banks#r4>. (Accessed 2021 Jan 17).

[78] Longcore T, Mattoni R, Pratt G, Rich C. 2000. On the perils of ecological restoration: Lessons from the El Segundo blue butterfly. Pages 281-286 *in* Keeley JE, Baer-Keeley M, Fotheringham CJ, editors. 2nd Interface Between Ecology and Land Development in California. U.S. Geological Survey Open-file Report 00-62. U.S. Geological Survey, Sacramento, CA.

The DEIR proposes two success criteria, the first of which is: "[a] surveyed plant population size count roughly equal to or greater than the number of individuals transplanted (this total may include both transplanted individuals that have survived, as well as any additional supplemental plantings following the initial transplantation that have survived at least two growing seasons)." This success criterion is inappropriate because it does not address annual plants (which would entail dispersal of seed), and the criterion for perennial plants is contingent on the number of individuals transplanted, for which there is no standard (i.e., would all perennial plants within impact areas be transplanted?). Although the success criterion suggests supplemental plantings may be required, the DEIR does not identify where the supplemental plantings (or seeds of annual species) would come from. As stated above, the introduction of non-local genes into an area can have negative impacts on the ecological community at the receptor site.[79]

The second success criterion is: "[l]ess than 5 percent cover of invasive weeds within the restoration area." This criterion is confusing because restoration involves returning an ecosystem to a close approximation of its condition prior to disturbance.[80] However, MM BIO-2 entails translocation or relocation of plants, not restoration. Therefore, it is unclear whether MM BIO-2 applies to off-site mitigation for the Project's permanent impacts, on-site mitigation for the Project's temporary impacts, or both. Nevertheless, the adequacy of the proposed success criterion cannot be evaluated without corresponding information on invasive plant cover prior to the restoration efforts. For example, the success criterion would be appropriate if invasive plants currently cover 50 percent of the mitigation site; however, it would be inappropriate if invasive plants are currently absent from the mitigation site.[81]

MM BIO-4 (Blue Oak Woodland)

The DEIR concludes that Mitigation Measure BIO-4 would reduce Project impacts on blue oak woodland to less than significant levels because: (a) the Applicants would develop and implement a Habitat Restoration Plan, which would include replacement of permanently impacted blue oak woodland at a ratio of 1.1:1; and (b) oak trees that are removed would be replaced in accordance with provisions of the City of Paso Robles' Oak Tree Ordinance.

The 1.1:1 mitigation ratio proposed in the DEIR would not mitigate the Project's significant impacts on blue oak woodland because it does not account for: (a) uncertainty in the ability to fully replace habitat functions that are impacted, (b) temporal loss (i.e., the lag time between habitat functions lost at the impact site and habitat functions gained at the mitigation site),[82] and

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[79] *Ibid. See also* California Native Plant Society. 2001. CNPS Guidelines for Landscaping to Protect Native Vegetation from Genetic Degradation. Available at: <https://www.cnps.org/wpcontent/uploads/2018/04/landscaping.pdf>. (Accessed 2021 Jan 17).

[80] *See* Longcore T, Mattoni R, Pratt G, Rich C. 2000. On the perils of ecological restoration: Lessons from the El Segundo blue butterfly. Pages 281-286 *in* Keeley JE, Baer-Keeley M, Fotheringham CJ, editors. 2nd Interface Between Ecology and Land Development in California. U.S. Geological Survey Open-file Report 00-62. U.S. Geological Survey, Sacramento, CA.

[81] Only some nonnative plants are invasive. Lists of invasive plants in California are maintained by the California Invasive Plant Council (https://www.cal-ipc.org/plants/inventory/) and the California Department of Food and Agriculture (https://www.cdfa.ca.gov/plant/IPC/encycloweedia/weedinfo/winfo_table-sciname.html).

[82] Moilanen A, van Teeffelen AJA, Ben-Haim Y, Ferrier S. 2009. How Much Compensation is Enough? A Framework for Incorporating Uncertainty and Time Discounting When Calculating Offset Ratios for Impacted Habitat. Restoration Ecology 17(4):470-478.

(c) indirect impacts. In this case, there is considerable uncertainty in whether the habitat compensation required under MM BIO-4 would adequately replace the habitat impacted at the Project site because the only standard the DEIR establishes for the mitigation site is that 65 percent of the oak plantings survive for 5 years. In addition, the duration of temporal loss would be considerable, and the Project's indirect impacts are likely to result in as least some level of oak mortality (e.g., due to root damage caused by construction activities or pathogens caused by tree trimming). Moreover, it is unclear if MM BIO-4 requires 1.1 acres of blue oak woodland creation (or restoration) for each acre of blue oak woodland permanently impacted by the Project, or merely planting of blue oaks across 1.1 acres of existing blue oak woodland (for each acre permanently impacted by the Project).

MM BIO-4 states: "[b]lue oak woodland restoration or compensation may be completed at the work area, in the vicinity, or at a conservation bank with a service area that covers the Proposed Project or selected alternative." There do not appear to be any conservation banks that sell credits for impacts to blue oak woodland.[83] Thus, the mitigation would occur "at the work area [or] in the vicinity." The DEIR fails to establish mechanisms that would ensure a mitigation site "at the work area [or] in the vicinity" would be protected and managed in perpetuity to maintain the blue oak woodland compensation habitat.

Compliance with the City's Oak Tree Ordinance does not mitigate the impact to oak trees because it only applies to trees that have a diameter at breast height ("DBH") of 6 inches or greater, and it only requires replacement at a ratio of 25 percent of the diameter of trees that are removed. In addition, MM BIO-4 only requires 65 percent of the replacement trees to survive beyond 5 years. Thus, MM BIO-4 does not require replacement of small oaks (< 6 inches DBH), but it allows the Applicants to replace large oaks with small ones.[84] This would not mitigate the impacts because small oaks do not provide the same ecological values as large ones, and even if the replacement trees survive to maturity (most do not), it would take decades for them replace the ecological values associated with the trees that are removed.

Blue oak woodlands are comprised of slow growing, long-lived trees.[85] Even at the best sites, it takes blue oaks at least 50 years to reach maturity.[86] Large, mature oak trees are especially important to wildlife because they provide key structural elements and characteristics (e.g., cavities, caching sites, and suitable substrates for raptor nests, among other habitat values) that are unavailable in smaller trees.[87] Verner and Boss (1980) provided data on wildlife use in blue oak savannahs of the western Sierra Nevada. They found that 29 species of amphibians and reptiles, 57 species of birds, and 10 species of mammals find mature stages of blue oak suitable

[83] California Department of Fish and Wildlife. 2021. Conservation and Mitigation Banks Established in California by CDFW [webpage]. Available at: <https://wildlife.ca.gov/conservation/planning/banking/approved-banks#r4>. (Accessed 2021 Jan 17).
[84] Under the City's Oak Tree Ordinance, replacement trees may be as small as 1.5-inch (trunk caliper) in size.
[85] California Wildlife Habitat Relationships System. 2005 [update]. Wildlife Habitats: Blue Oak Woodland. California Department of Fish and Game. California Interagency Wildlife Task Group. Available at: <https://www.wildlife.ca.gov/Data/CWHR/Wildlife-Habitats>.
[86] *Ibid*.
[87] CalPIF (California Partners in Flight). 2002. Version 2.0. The oak woodland bird conservation plan: a strategy for protecting and managing oak woodland habitats and associated birds in California (S. Zack, lead author). Point Reyes Bird Observatory, Stinson Beach, CA.

or optimum for breeding, assuming that other special habitat requirements are met.[88] Most blue oak woodlands are not regenerating naturally, which means most of the mature trees will not be replaced when they die. This heightens the significance of each mature oak tree that is removed by the Project.

The success criterion proposed in MM BIO-4 (i.e., "a minimum of 65 percent survival of woody plantings after 5 years") provides no assurances that the replacement trees are likely to survive, or that they will ever provide structural elements and characteristics comparable to the trees that are removed. Blue oak seedlings are especially vulnerable to mortality factors when they are young and small. Phillips et al. (2007) reported that blue oak seedlings died at an average age of 6.4 years.[89] Once seedlings had grown for approximately a decade and become established, the chances were good that they would remain alive. However, many grew extremely slowly or even diminished in height. Indeed, Phillips et al. (1996) concluded that blue oak seedlings that were only 6.5 inches tall could well have been older than 26 years.[90] Based on these studies, the CPUC should not assume blue oak plantings have a reasonable likelihood of replacing impacted trees until the plantings: (a) are at least 10 years old, (b) have reached the sapling stage, and (c) are protected from herbivory by cattle and deer.

Invasive Plants

The California Invasive Plant Council has published guidelines for preventing the spread of invasive plants.[91] The best management practices ("BMPs") described therein are feasible and should be incorporated as required mitigation measures. The DEIR does not incorporate any mitigation measures for invasive plants, nor does it establish performance standards for invasive plants in the "restoration" areas (unless those areas are being used for special-status plant mitigation). As a result, potentially significant impacts associated with the colonization or spread of invasive plants remains unmitigated.

[88] *See* California Wildlife Habitat Relationships System. 2005 [update]. Wildlife Habitats: Blue Oak Woodland. California Department of Fish and Game. California Interagency Wildlife Task Group. Available at: <https://www.wildlife.ca.gov/Data/CWHR/Wildlife-Habitats>.
[89] Phillips RL, McDougald NK, McCreary D, Atwill ER. 2007. Blue oak seedling age influences growth and mortality. California Agriculture 61(1):11-15.
[90] Phillips RL, McDougald NK, Standiford RB, Frost WE. 1996. Blue oak seedlings may be older than they look. California Agriculture 50(3):17-19.
[91] Cal-IPC. 2012. Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers (3rd ed.). Cal-IPC Publication 2012-03. California Invasive Plant Council, Berkeley, CA.

CONCLUSION

Substantial evidence demonstrates that the Project could have significant, unmitigated impacts on sensitive biological resources. The DEIR that was prepared for the Project does not adequately disclose and analyze those impacts, nor does it provide the mitigation necessary to ensure significant impacts are reduced to less than significant levels.

Sincerely,

Scott Cashen, M.S.
Senior Biologist

Scott Cashen, M.S.
Senior Wildlife Biologist

Scott Cashen has 28 years of professional experience in natural resources management. During that time he has worked as a field biologist, forester, environmental consultant, and instructor of Wildlife Management. Mr. Cashen focuses on CEQA/NEPA compliance issues, endangered species, scientific field studies, and other topics that require a high level of scientific expertise.

Mr. Cashen has knowledge and experience with numerous taxa, ecoregions, biological resource issues, and environmental regulations. As a biological resources expert, Mr. Cashen is knowledgeable of the various agency-promulgated guidelines for field surveys, impact assessments, and mitigation. Mr. Cashen has led field investigations on several special-status species, including ones focusing on the yellow-legged frog, red-legged frog, desert tortoise, steelhead, burrowing owl, California spotted owl, northern goshawk, willow flycatcher, Peninsular bighorn sheep, red panda, and various forest carnivores.

Mr. Cashen is a recognized expert on the environmental impacts of renewable energy development. He has been involved in the environmental review process of over 100 solar, wind, biomass, and geothermal energy projects. Mr. Cashen's role in this capacity has encompassed all stages of the environmental review process, from initial document review through litigation support. Mr. Cashen provided expert witness testimony on several of the Department of the Interior's "fast-tracked" renewable energy projects. His testimony on those projects helped lead agencies develop project alternatives and mitigation measures to reduce environmental impacts associated with the projects.

Mr. Cashen was a member of the independent scientific review panel for the Quincy Library Group project, the largest community forestry project in the United States. As a member of the panel, Mr. Cashen was responsible for advising the U.S. Forest Service on its scientific monitoring program, and for preparing a final report to Congress describing the effectiveness of the Herger-Feinstein Forest Recovery Act of 1998.

AREAS OF EXPERTISE

- CEQA, NEPA, and Endangered Species Act compliance issues
- Comprehensive biological resource assessments
- Endangered species management
- Renewable energy development
- Scientific field studies, grant writing and technical editing

EDUCATION

M.S. Wildlife and Fisheries Science - The Pennsylvania State University (1998)
Thesis: *Avian Use of Restored Wetlands in Pennsylvania*
B.S. Resource Management - The University of California, Berkeley (1992)

PROFESSIONAL EXPERIENCE

Litigation Support / Expert Witness

Mr. Cashen has served as a biological resources expert for over 125 projects subject to environmental review under the California Environmental Quality Act (CEQA) and/or the National Environmental Policy Act (NEPA). As a biological resources expert, Mr. Cashen reviews CEQA/NEPA documents and provides his clients with an assessment of biological resource issues. He then submits formal comments on the scientific and legal adequacy of the project's environmental documents (e.g., Environmental Impact Report). If needed, Mr. Cashen conducts field studies to generate evidence for legal testimony, or he can obtain supplemental testimony from his deep network of species-specific experts. Mr. Cashen has provided written and oral testimony to the California Energy Commission, California Public Utilities Commission, and U.S. district courts. His clients have included law firms, non-profit organizations, and citizen groups.

REPRESENTATIVE EXPERIENCE

Solar Energy

- Abengoa Mojave Solar Project
- Avenal Energy Power Plant
- Beacon Solar Energy Project
- Blythe Solar Power Project
- Calico Solar Project
- California Flats Solar Project
- Calipatria Solar Farm II
- Carrizo Energy Solar Farm
- Catalina Renewable Energy
- Fink Road Solar Farm
- Genesis Solar Energy Project
- Heber Solar Energy Facility
- Imperial Valley Solar Project
- Ivanpah Solar Electric Generating
- Maricopa Sun Solar Complex
- McCoy Solar Project
- Mt. Signal and Calexico Solar
- Panoche Valley Solar
- San Joaquin Solar I & II
- San Luis Solar Project
- Stateline Solar Project
- Solar Gen II Projects
- SR Solis Oro Loma
- Vestal Solar Facilities
- Victorville 2 Power Project
- Willow Springs Solar

Geothermal Energy

- Casa Diablo IV Geothermal
- East Brawley Geothermal
- Mammoth Pacific 1 Replacement
- Orni 21 Geothermal Project
- Western GeoPower Plant

Wind Energy

- Catalina Renewable Energy
- Ocotillo Wind Energy Project
- SD County Wind Energy
- Searchlight Wind Project
- Shu'luuk Wind Project
- Tres Vaqueros Repowering Project
- Tule Wind Project
- Vasco Winds Relicensing Project

Biomass Facilities

- CA Ethanol Project
- Colusa Biomass Project
- Tracy Green Energy Project

Other Development Projects

- Cal-Am Desalination Project
- Carnegie SVRA Expansion Project
- Lakeview Substation Project
- Monterey Bay Shores Ecoresort
- Phillips 66 Rail Spur
- Valero Benecia Crude By Rail
- World Logistics Center

Project Management

Mr. Cashen has managed several large-scale wildlife, forestry, and natural resource management projects. Many of the projects have required hiring and training field crews, coordinating with other professionals, and communicating with project stakeholders. Mr. Cashen's experience in study design, data collection, and scientific writing make him an effective project manager, and his background in several different natural resource disciplines enable him to address the many facets of contemporary land management in a cost-effective manner.

REPRESENTATIVE EXPERIENCE

Wildlife Studies

- Peninsular Bighorn Sheep Resource Use and Behavior Study: (*CA State Parks*)
- "KV" Spotted Owl and Northern Goshawk Inventory: (*USFS, Plumas NF*)
- Amphibian Inventory Project: (*USFS, Plumas NF*)
- San Mateo Creek Steelhead Restoration Project: (*Trout Unlimited and CA Coastal Conservancy, Orange County*)
- Delta Meadows State Park Special-Status Species Inventory: (*CA State Parks, Locke*)

Natural Resources Management

- Mather Lake Resource Management Study and Plan – (*Sacramento County*)
- Placer County Vernal Pool Study – (*Placer County*)
- Weidemann Ranch Mitigation Project – (*Toll Brothers, Inc., San Ramon*)
- Ion Communities Biological Resource Assessments – (*Ion Communities, Riverside and San Bernardino Counties*)
- Del Rio Hills Biological Resource Assessment – (*The Wyro Company, Rio Vista*)

Forestry

- Forest Health Improvement Projects – (*CalFire, SD and Riverside Counties*)
- San Diego Bark Beetle Tree Removal Project – (*SDG&E, San Diego Co.*)
- San Diego Bark Beetle Tree Removal Project – (*San Diego County/NRCS*)
- Hillslope Monitoring Project – (*CalFire, throughout California*)

Biological Resources

Mr. Cashen has a diverse background with biological resources. He has conducted comprehensive biological resource assessments, habitat evaluations, species inventories, and scientific peer review. Mr. Cashen has led investigations on several special-status species, including ones focusing on the foothill yellow-legged frog, mountain yellow-legged frog, desert tortoise, steelhead, burrowing owl, California spotted owl, northern goshawk, willow flycatcher, Peninsular bighorn sheep, red panda, and forest carnivores.

REPRESENTATIVE EXPERIENCE

Biological Assessments/Biological Evaluations ("BA/BE")

- Aquatic Species BA/BE – Reliable Power Project (*SFPUC*)
- Terrestrial Species BA/BE – Reliable Power Project (*SFPUC*)
- Management Indicator Species Report – Reliable Power Project (*SFPUC*)
- Migratory Bird Report – Reliable Power Project (*SFPUC*)
- Terrestrial and Aquatic Species BA – Lower Cherry Aqueduct (*SFPUC*)
- Terrestrial and Aquatic Species BE – Lower Cherry Aqueduct (*SFPUC*)
- Terrestrial and Aquatic Species BA/BE – Public Lands Lease Application (*Society for the Conservation of Bighorn Sheep*)
- Terrestrial and Aquatic Species BA/BE – Simon Newman Ranch (*The Nature Conservancy*)
- Draft EIR (Vegetation and Special-Status Plants) - Wildland Fire Resiliency Program (*Midpeninsula Regional Open Space District*)

Avian

- Study design and Lead Investigator - Delta Meadows State Park Special-Status Species Inventory *(CA State Parks: Locke)*
- Study design and lead bird surveyor - Placer County Vernal Pool Study *(Placer County: throughout Placer County)*
- Surveyor - Willow flycatcher habitat mapping *(USFS: Plumas NF)*
- Surveyor - Tolay Creek, Cullinan Ranch, and Guadacanal Village restoration projects *(Ducks Unlimited/USGS: San Pablo Bay)*
- Study design and Lead Investigator - Bird use of restored wetlands research *(Pennsylvania Game Commission: throughout Pennsylvania)*
- Study design and surveyor - Baseline inventory of bird species at a 400-acre site in Napa County *(HCV Associates: Napa)*
- Surveyor - Baseline inventory of bird abundance following diesel spill *(LFR Levine-Fricke: Suisun Bay)*

- Study design and lead bird surveyor - Green Valley Creek Riparian Restoration Site *(City of Fairfield: Fairfield, CA)*
- Surveyor - Burrowing owl relocation and monitoring *(US Navy: Dixon, CA)*
- Surveyor - Pre-construction burrowing owl surveys *(various clients: Livermore, San Ramon, Rio Vista, Napa, Victorville, Imperial County, San Diego County)*
- Surveyor - Backcountry bird inventory *(National Park Service: Eagle, Alaska)*
- Lead surveyor - Tidal salt marsh bird surveys (*Point Reyes Bird Observatory: throughout Bay Area*)
- Surveyor – Pre-construction surveys for nesting birds (*various clients and locations)*

Amphibian

- Crew Leader - Red-legged frog, foothill yellow-legged frog, and mountain yellow-legged frog surveys *(USFS: Plumas NF)*
- Surveyor - Foothill yellow-legged frog surveys *(PG&E: North Fork Feather River)*
- Surveyor - Mountain yellow-legged frog surveys *(El Dorado Irrigation District: Desolation Wilderness)*
- Crew Leader - Bullfrog eradication *(Trout Unlimited: Cleveland NF)*

Fish and Aquatic Resources

- Surveyor - Hardhead minnow and other fish surveys *(USFS: Plumas NF)*
- Surveyor - Weber Creek aquatic habitat mapping (*El Dorado Irrigation District: Placerville, CA*)
- Surveyor - Green Valley Creek aquatic habitat mapping *(City of Fairfield: Fairfield, CA)*
- GPS Specialist - Salmonid spawning habitat mapping *(CDFG: Sacramento River)*
- Surveyor - Fish composition and abundance study (*PG&E: Upper North Fork Feather River and Lake Almanor*)
- Crew Leader - Surveys of steelhead abundance and habitat use *(CA Coastal Conservancy: Gualala River estuary)*
- Crew Leader - Exotic species identification and eradication *(Trout Unlimited: Cleveland NF)*

Mammals

- Principal Investigator – Peninsular bighorn sheep resource use and behavior study (*California State Parks: Freeman Properties*)

- Scientific Advisor –Study on red panda occupancy and abundance in eastern Nepal *(The Red Panda Network: CA and Nepal)*
- Surveyor - Forest carnivore surveys *(University of CA: Tahoe NF)*
- Surveyor - Relocation and monitoring of salt marsh harvest mice and other small mammals *(US Navy: Skagg's Island, CA)*
- Surveyor – Surveys for Monterey dusky-footed woodrat. Relocation of woodrat houses (*Touré Associates: Prunedale*)

Natural Resource Investigations / Multiple Species Studies

- Scientific Review Team Member – Member of the scientific review team assessing the effectiveness of the US Forest Service's implementation of the Herger-Feinstein Quincy Library Group Act.
- Lead Consultant - Baseline biological resource assessments and habitat mapping for CDF management units *(CDF: San Diego, San Bernardino, and Riverside Counties)*
- Biological Resources Expert – Peer review of CEQA/NEPA documents (*various law firms, non-profit organizations, and citizen groups)*
- Lead Consultant - Pre- and post-harvest biological resource assessments of tree removal sites *(SDG&E: San Diego County)*
- Crew Leader - T&E species habitat evaluations for Biological Assessment in support of a steelhead restoration plan *(Trout Unlimited: Cleveland NF)*
- Lead Investigator - Resource Management Study and Plan for Mather Lake Regional Park *(County of Sacramento: Sacramento, CA)*
- Lead Investigator - Biological Resources Assessment for 1,070-acre Alfaro Ranch property *(Yuba County, CA)*
- Lead Investigator - Wildlife Strike Hazard Management Plan *(HCV Associates: Napa)*
- Lead Investigator - Del Rio Hills Biological Resource Assessment *(The Wyro Company: Rio Vista, CA)*
- Lead Investigator – Ion Communities project sites (*Ion Communities: Riverside and San Bernardino Counties*)
- Surveyor – Tahoe Pilot Project: Validation of California's Wildlife Habitat Relationships (CWHR) Model *(University of California: Tahoe NF)*

Forestry

Mr. Cashen has five years of experience working as a consulting forester on projects throughout California. Mr. Cashen has consulted with landowners and timber operators on forest management practices; and he has worked on a variety of forestry tasks including selective tree marking, forest inventory, harvest layout, erosion control, and supervision of logging operations. Mr. Cashen's experience with many different natural resources enable him to provide a holistic approach to forest management, rather than just management of timber resources.

REPRESENTATIVE EXPERIENCE

- Lead Consultant - CalFire fuels treatment projects *(SD and Riverside Counties)*
- Lead Consultant and supervisor of harvest activities – San Diego Gas and Electric Bark Beetle Tree Removal Project *(San Diego)*
- Crew Leader - Hillslope Monitoring Program *(CalFire: throughout California)*
- Consulting Forester – Forest inventories and timber harvest projects *(various clients throughout California)*

Grant Writing and Technical Editing

Mr. Cashen has prepared and submitted over 50 proposals and grant applications. Many of the projects listed herein were acquired through proposals he wrote. Mr. Cashen's clients and colleagues have recognized his strong scientific writing skills and ability to generate technically superior proposal packages. Consequently, he routinely prepares funding applications and conducts technical editing for various clients.

PERMITS

U.S. Fish and Wildlife Service Section 10(a)(1)(A) Recovery Permit for the Peninsular bighorn sheep

PROFESSIONAL ORGANIZATIONS / ASSOCIATIONS

The Wildlife Society

Cal Alumni Foresters

Mt. Diablo Audubon Society

OTHER AFFILIATIONS

Scientific Advisor and Grant Writer – *The Red Panda Network*

Scientific Advisor – *Mt. Diablo Audubon Society*

Grant Writer – *American Conservation Experience*

TEACHING EXPERIENCE

Instructor: Wildlife Management - The Pennsylvania State University, 1998

Teaching Assistant: Ornithology - The Pennsylvania State University, 1996-1997

PUBLICATIONS

Gutiérrez RJ, AS Cheng, DR Becker, S Cashen, et al. 2015. Legislated collaboration in a conservation conflict: a case study of the Quincy Library group in California, USA. Chapter 19 *in*: Redpath SR, et al. (eds). Conflicts in Conservation: Navigating Towards Solutions. Cambridge Univ. Press, Cambridge, UK.

Cheng AS, RJ Gutiérrez RJ, S Cashen, et al. 2016. Is There a Place for Legislating Place-Based Collaborative Forestry Proposals?: Examining the Herger-Feinstein Quincy Library Group Forest Recovery Act Pilot Project. Journal of Forestry.

EXHIBIT C

1. Is Estrella needed to solve distribution system problems?

a. Is Estrella needed to meet DPA peak loads?

No. The applicants have repeatedly claimed that summer peak loads in the Paso Robles Distribution Planning Area ("DPA") are expected to exceed the DPA capacity of 212.55 Mw in the next 5 to 15 years (Revised PEA, Appendix G; 2018 update to Appendix G; 2019 updated DPA forecast). The DEIR repeats PG&E's claim that the Paso Robles DPA loads "will exceed the available capacity of the Paso Robles system within 5 to 15 years (see Figure 2-5)." (DEIR, p. 2012). But the very figure the DEIR cites contradicts PG&E's conclusion. DEIR Figure 2-5 shows that, while forecasts made in 2017-19 did indeed show Paso Robles DPA load exceeding its capacity by no later than 2024, the more recent load forecast for the Paso Robles DPA shows no such thing. Paso Robles DPA actual loads in 2019 were only 168 Mw, lower than in 2007, and some 44 MVA below DPA capacity (DEIR, p. 2-13). That 44 MVA margin was the largest since 2011 (DEIR, p. 2-13). The resultant 2020 forecast, even though it is based on 1-year-in-10 hot weather, shows peak loads well below DPA capacity throughout the 2020s. DPA loads grow only 5 Mw from 2020 through 2029, and in 2029 they are still 10 Mw below DPA capacity (DEIR, p. 2-12; note that the DPA capacity already includes a 5% derating of total DPA capacity compared to individual substation capacity, to allow for difficulties in matching loads to the substations with the most spare capacity). At that rate, DPA loads will not exceed the DPA capacity of 212.55 Mw for another 18 years after the last forecast year, or not until 2047. Estrella is not needed to meet a DPA capacity problem that does not exist today, is not projected to exist in this decade, and is on trend to not exist until well into the 2040s.

b. Is Estrella needed to improve distribution system reliability by reducing outages?

No. The DEIR contains language (taken from the applicant's PEA and its Appendix G) indicating that, in theory, longer distribution lines have worse reliability, and that Estrella, by enabling shorter lines will improve reliability (DEIR, p. 2-6). But the actual data do not support the theory. Estrella is proposed to be built in an area now served by distribution circuit Templeton 2109. The data show that the Templeton 2109 distribution circuit has reliability no worse than other Templeton circuits, other Paso Robles DPA circuits, or other circuits in the PG&E service area as a whole. Of the 6 Templeton distribution circuits, the 2012-2017 data in the DEIR shows that Templeton 2109 had the fewest momentary outages and the third-fewest sustained outages, an average of exactly one per year (DEIR, p. 2-8; note that the listing of individual outages on the following pages excludes the Templeton 2113 circuit, the one with the most outages in the 2012-17 period).

Even accounting for the larger number of customers affected by the worst outage on the Templeton 2109 circuit, it still had an annual average outage duration per customer of only 46-58

minutes.[1] That is comparable to the other Templeton circuits (annual average of 49.5 minutes, per DEIR, p. 2-10). It is better than the annual average for other Paso Robles DPA circuits (79.7 minutes, per DEIR, p. 2-11) or other circuits throughout the PG&E service area (67.4 minutes, per DEIR, p. 2-11). Estrella is not needed to improve reliability on a circuit that already has above-average reliability.

2. Is Estrella needed to mitigate reliability impacts of transmission level outages?

a. Is Estrella needed to mitigate the impacts of an outage of the Templeton-Paso Robles 70 kV transmission line?

The proposed Estrella substation is not needed for this purpose, but a new 70 kV circuit would be needed, as has apparently been true for some 20+ years. Paso Robles substation is served by two 70 kV lines. An outage of one of those lines (also known as an "N-1" or P1 outage, or as a Category B outage prior to 2015), means that the entire Paso Robles load would need to be served via the remaining line.

Paso Robles peak loads in 2017 reached 72 Mw (2/23/18 letter from CAISO to CPUC). Of the two lines into Paso Robles, the Templeton-Paso Robles line is capable of delivering over 100 Mw, so an outage of the San Miguel-Paso Robles line would mean the remaining line could easily serve the full Paso Robles load, even at summer peak levels. However, the Coalinga-San Miguel-Paso Robles 70 kV line has a maximum summer capacity of just 42 Mw under N-1 conditions, and some of that capacity is used to serve San Miguel loads before the line continues on to Paso Robles. The net capacity that is available for delivery to Paso Robles from Miguel after an N-1 event is thus only about 27 Mw (only 20 Mw per PG&E, response to DR3, p. 3; 27 Mw based on 42 Mw line capacity minus San Miguel peak load of 15 Mw. The 6/20/18 revised PEA Appendix G, Table 4, shows San Miguel load flat at 15 Mw in every year from 2017-26, inclusive). Thus, an outage of the Templeton-Paso Robles line would cause the San Miguel-Paso Robles line to overload after an outage of the Templeton-Paso Robles line, any time that the Paso Robles load was above 27 Mw.

If Paso Robles peak load reached 72 Mw in 2017, then it must have been above 27 Mw for many years before that. The installation of a UVLS in 2006 (cDR) suggests it was already above 27 Mw then. Indeed, if Paso Robles peak load was less than 27 Mw in 2006, then it grew over 9.3 percent per year from 2006 to 2017 ((72/27)^(1/11)=1.093), a period when PG&E system peak demand was falling (DM data base, using CAISO OASIS data, showing PG&E peak demand of

[1] The DEIR does not say how many customers are served by the Templeton 2109 circuit. At a minimum, there are 4305, the number affected by the May 2012 outage (DEIR, p. 2-9). Multiplying the duration times the affected customers for each Templeton 2109 outage (as shown in the DEIR, p. 2-9), and summing, there were 1.24 million customer minute of outage over the 2012-17 period. Dividing that by 4305 customers yields an annual average of 57.7 minutes per year per customer, which is a worst case. If the actual number of customers is 25 percent higher, because the number of customers grew after 2012 and because the 2012 outage did not affect 100% of the customers on the circuit (which is likely), then the annual average is 46.2 minutes per year per customer.

22,650 Mw in 2006 and 21,713 Mw in 2018). That seems unlikely. If Paso Robles load growth has been "only" 5 percent per year in the years before 2017, then it must have reached 27 Mw in the year 1997. So it would appear that there has been a need for a transmission line with a greater capacity than the Coalinga-San Miguel-Paso Robles line for over 20 years.

The Estrella project is one way to solve the reliability risk due to a Templeton-Paso Robles outage, but it is not the only one. Estrella solves the problem by replacing the low capacity San Miguel-Paso Robles line with a higher capacity Estrella-Paso Robles line with a line capacity of up to 100 MVA (summer normal rating) or 118 MVA (summer emergency rating)(ratings based on CAISO, 2013-2014 Transmission Plan, calling for minimum summer normal/emergency ratings of 825/975 amperes). But the alternate of a 2nd Templeton-Paso Robles 70 kV line, described in the DEIR, would do the same thing, and be considerably shorter and, according to the DEIR, cheaper (DEIR, p. 5-17).

A further potential option, not discussed at all in the DEIR, would be to use the San Miguel-Unionpage 70 kV line mentioned in both a CAISO presentation as part of its 2020-2021 Transmission Plan development (CAISO, 9/23/20 presentation, pdf p. 29 of 247) and the associated model outputs (CAISO, final reliability assessment results for CCLP, pdf pp. 7-9 and 11 of 14), coupled with reconductoring of the entire San Miguel-Paso Robles line (not just the 3 miles already proposed for reconductoring and analyzed in the DEIR). Assuming the San Miguel-Unionpage line exists, is the same size as the San Miguel-Coalinga line, and could be fully loaded after an outage of the Templeton-Paso Robles line, then 84 MVA could be delivered to San Miguel after such an outage. Subtracting the 15 MVA needed to meet San Miguel loads, that would leave 69 MVA deliverable to Paso Robles substation over a reconductored San Miguel-Paso Robles line. 69 MVA is very close to the peak Paso Robles load of 72 MVA experienced in 2017. That 72 MVA peak was, and may well be higher than the reduced Paso Robles substation load forecast that must underlie the reduced 2020-2029 Paso Robles DPA load forecast shown in the DEIR (DEIR, Table 2-5; the DEIR does not provide the 2020-2029 forecast for Paso Robles substation which underlies the 2020-2029 DPA forecast). If this option were indeed viable, it would mean that no new transmission lines would be needed

b. Is Estrella needed to mitigate the impacts of an outage of the Templeton 230/70 kV transformer?

Perhaps, but it is not clear, and is certainly not demonstrated by the DEIR.

An outage of the Templeton transformer would require loads at Templeton, Paso Robles and San Miguel substations to all be met with imports over two 70 kV lines, one from either he southwest (Templeton-Atascadero) and one from the northeast (Coalinga-San Miguel). The normal rating of the Templeton-Atascadero line was increased to 100 MVA by a reconductoring in 2008 (CAISO 2008 Transmission Plan, p. 120, Table A-1). The typical emergency rating of a 100 MVA line (i.e., after an N-1 outage such as a Templeton transformer outage) is 118 Mw. The

emergency rating of the Coalinga-San Miguel line is 42 Mw (CAISO letter to CPUC, 2/23/18). (Note that this is a summer rating; the winter rating is much higher). Thus, if the combined loads of San Miguel, Paso Robles, and Templeton were over 160 Mw, an outage of the Templeton transformer would cause overloads of the Coalinga-San Miguel and/or Atascadero-Templeton lines. (Note that the CAISO has recently also referred to another 70 kV line to San Miguel besides the Coalinga-San Miguel and Paso Robles-San Miguel lines, a San Miguel - Unionpgae line. See CAISO, 9/23/20 presentation re 2020-21 Transmission Plan, pdf. p. 29 of 247. This line, if it exists but is no larger than the San Miguel-Coalinga line, could deliver another 42 MVA to the Paso Robles DPA.)

The most recent load forecast for the Paso Robles DPA shows peak summer loads of 193-203 Mw during the 2020s, with the maximum of 203 Mw in 2028 (DEIR, p. 2-12, Figure 2-5). The Paso Robles DPA includes Atascadero substation, with forecast loads of 29.74 Mw in 2028 in an older DPA forecast in which total DPA load was 221.57 Mw during the 2020s (PG&E, response to DR4, p. 4). Put another way, Atascadero loads were 13.42 percent of 2028 Paso Robles DPA loads in the 2019 forecast (29.74/221.57). Assuming the reduced DPA forecast of 2020 includes a proportional reduction for Atascadero substation, then the currently forecasted loads for San Miguel plus Paso Robles plus Templeton reach a peak value of 203 x .8658 = 176 Mw in 2028. That means that there would be an overload of at least 10 percent on one or both of the Coalinga-San Miguel and Atascadero-Templeton lines after an outage of the Templeton 230/70 kV transformer in 2028 at the time of the summer peak.

To mitigate this potential outage, there are at least three options. The first is to drop load, using the existing UVLS which has been in place since 2006 but has never yet needed to operate. That would protect the electrical system, but not its customers, just as the UVLS today protects the Coalinga-San Miguel-Paso Robles line from overloading after an N-1 outage of the Templeton-Paso Robles 70 kV line. The second option is to build a second 230/70 kV transformer feeding the 70 kV lines in the Paso Robles DPA. That second transformer could be the one proposed for Estrella, or the one suggested in the DEIR at an alternate substation location adjacent to Templeton substation (DEIR, Appendix B, p. 3-31), or one at a different alternate substation location 2 miles northeast of Templeton (see below), a location ignored in the DEIR. It apparently could not be at the Templeton substation itself, due to space considerations (DEIR, Appendix B, p. 3-36). The third option is local generation located within the Paso Robles DPA. Such generation would only need to be large enough to mitigate overloads during peak load conditions; during off-peak conditions when loads are lower, the existing 70 kV system would be adequate; during non-summer months, 70 kV line ratings would be higher and overloads would also not occur after a transformer outage. A potential 4th option is to use deliveries over a San Miguel-Unionpgae 70 kV line, probably coupled with reconductoring of the existing San Miguel-Paso Robles line, as described above as possible mitigation for an outage of the Templeton-Paso Robles line.

The applicants may argue that the option of relying upon the UVLS to protect the electrical system from undervoltages after a Templeton transformer outage is inappropriate because it means dropping load after an N-1 contingency. It would indeed, but that has also been true for years with regard to an N-1 outage of the Templeton-Paso Robles 70 kV line. The DEIR should explain why the UVLS alternative has been OK for Paso Robles in the past, but has ceased to be acceptable.

With regard to the alternative of a second 230/70 kV transformer, the DEIR is clear that a new transformer located near the Templeton substation would be electrically suitable as a source of supply for a new 70 kV transmission line to Paso Robles. The DEIR does not explain why the new 230/70 kV substation could not be located 2 miles farther northeast, still adjacent to the existing 230 kV lines, and thus shorten the required 70 kV line by 2 miles. Relocating the 230/70 kV substation farther from Templeton substation would also increase the claimed distribution benefits of the new substation, should it ever be used as a distribution substation, by moving it closer to Paso Robles and farther from Templeton.

With regards to generation alternatives to a new 230/70 kV transformer, it is not clear whether the DEIR has addressed how long it would take after a Templeton transformer outage for loads to fall to the level at which the existing 70 kV transmission system would be adequate, and what generation alternatives would exist to supplement the 70 kV system during the high load hours when they would be needed. Given that the needed generation resources might be as low as 16 Mw under the latest DPA load forecast, and that the highest load summer hours are hours when solar power is likely to be available, it might take as little as 30-40 Mw of installed solar capacity to mitigate the risk of an on-peak failure of the Templeton transformer during the 2020s. A BESS alternative would also be an option if it would only be needed for a few hours until loads dropped overnight, and could then be recharged before the following afternoon's peak loads (assuming a transformer outage took more than 24 hours to repair).

With regards to the possible 4th option, if it exists (see discussion above regarding mitigation for an outage of the Templeton-Paso Robles 70 kV line), then in concert with reconductoring of the San Miguel-Paso Robles line, it would allow up to 84 MVA to be imported into the Paso Robles DPA under emergency conditions after an outage of the Templeton 230/70 kV line. Together with up to 118 MVA via the Atascadero-Templeton line, that would be a total of 202 MVA, more than the projected peak load of 176 MVA in 2028 for San Miguel plus Paso Robles plus Templeton. The DEIR never discusses the existence of a San Miguel-Unionpage line, or its possible contribution to meeting the reliability issues driving the proposed Estrella project.

c. Is Estrella needed to mitigate the impacts of an N-2 (Category C) outage of both 230 kV lines that connect to the Templeton 230/70 kV transformer?

No. Reliability rules allow load to be dropped after the outage of two separate transmission lines. A double 230 kV line outage on the lines feeding Templeton would make the Templeton

transformer unusable, and thus cause overloads on the underlying 70 kV system during high load periods, but that is irrelevant. Indeed, even if Estrella were built as proposed, Paso Robles would still face a blackout after an N-2 outage of the Estrella-Paso Robles and Templeton-Paso Robles 70 kV lines. The same is true for the environmentally preferred alternative described in the DEIR. Paso Robles is currently at risk of blackouts from a double transmission line outage, and Estrella would not change that fact. The CAISO's original authorization of Estrella was based on mitigating N-1 contingencies, and Estrella cannot be justified by its impact on N-2 contingencies.

In any case, even if it were appropriate to build new facilities just to mitigate the consequences of an N-2 outage, it is unclear that Estrella would be adequate. The year after Estrella was approved, the CAISO concluded that the proposed new Estrella-Paso Robles line would overload after an N-2 outage of the two 230 kV lines connected to the Templeton substation (CAISO, 9/24/14 presentation, pdf p. 91 of 162).

3. Is Estrella needed to mitigate reliability issues at and around the Cholame substation?

No. Although there are about 1500 Cholame-area customers at risk for scheduled outages every 1-2 years for maintenance work on the 70 kV line feeding Cholame substation, those outages are not a violation of NERC or CAISO or PG&E reliability criteria. PG&E has stated clearly that it has no plans to use the proposed Estrella substation as a source for a new 70 kV line to Cholame to supplement the existing single line there. (**Electric Distribution Resources Plan Application 2015 Rulemaking 14-10-003 Application 15-07-006, data request ED_019-Q01-18_Rev01, response to question 4)**.

On the other hand, in this proceeding the applicants filed a revised Appendix G to their PEA which states that "The proposed project provides a future opportunity to add an additional transmission line to Cholame Substation to create a looped circuit to improve reliability and operational flexibility on the 70 kV system. This line would likely be constructed within 2 to 3 years after Estrella Substation is built" (Appendix G to PEA, 6/20/18, p. UG-27). To the extent that building Estrella **would** lead to construction of a new 70 kV (or 21 kV) from Estrella to Cholame, the DEIR should have addressed that result; to do otherwise would be the kind of piecemealing that CEQA forbids.

4. The DEIR misstates the cost of the proposed project

The CAISO approved the Estrella project with an estimated cost of $35-45 million (CAISO, 2013-14 Transmission Plan), in 2014 dollars (CAISO, 21013-2014 Transmission Plan, 7/16/14, Appendix F, pdf p. 5 of 22). The project that the CAISO approved included all facilities above 50 kV, the threshold of CAISO jurisdiction. In particular, it included the short bits of 230 kV line which would connect the existing 230 kV line to the north and south ends of the proposed substation (to be built by PG&E), the 230/70 kV substation (to be built by HWT), and the 70 kV transmission line and line reconductoring (to be built by PG&E). It did not include 70/21 kV transformers or 21 kV distribution lines, which would be built by PG&E subject to CPUC

jurisdiction. The DEIR errs when it says that the $35-45 million estimate is just for the 230/70 kV substation to be built by HWT (DEIR, p. 5-16, fn. 2).

The DEIR also appears to err when it says the estimated total cost of the project is $150 million. CAISO-jurisdictional transmission projects with a capital cost over $50 million require CAISO Board approval, which the Estrella project has never received, since it was described to the CAISO in 2013-14 as having a $35-45 million total cost. If the $150 million figure in the DEIR were correct, then unless the distribution components cost over $100 million, that would mean the CAISO-jurisdictional transmission components will cost over $50 million.

The DEIR needs to be corrected to show current cost estimates for each of it three main components - the transmission level parts to be built by HWT, the transmission level parts to be built by PG&E, and the distribution level parts (if any, given the lack of need discussed above) to be built by PG&E.

RESUME

DAVID I. MARCUS **April 2014**

[redacted]

Employment

Self-employed, March 1981 - Present

Consultant on energy and electricity issues. Clients have included Imperial Irrigation District, the cities of Albuquerque and Boulder, the Rural Electrification Administration (REA), BPA, EPA, the Attorney Generals of California and New Mexico, the California Public Utilities Commission, alternative energy and cogeneration developers, environmental groups, labor unions, other energy consultants, and the Navajo Nation. Projects have included economic analyses of utility resource options and power contracts, utility restructuring, utility bankruptcy, coal and nuclear power plants, non-utility cogeneration plants, and offshore oil and hydroelectric projects. Experienced user of production cost models to evaluate utility economics. Very familiar with western U.S. grid (WSCC) electric resources and transmission systems and their operation and economics. Have also performed EIR/EIS reviews and need analyses of proposed coal, gas and hydro powerplants, transmission lines, substations, and coal mines. Have presented expert testimony before FERC, the California Energy Commission, the Public Utility Commissions of California, New Mexico, and Colorado, the Interstate Commerce Commission, and the U.S. Congress.

Environmental Defense Fund (EDF), October 1983 - April 1985

Economic analyst, employed half time at EDF's Berkeley, CA office. Analyzed nuclear power plant economics and coal plant sulfur emissions in New York state, using ELFIN model. Wrote critique of Federal coal leasing proposals for New Mexico and analysis of southwest U.S. markets for proposed New Mexico coal-fired power plants.

California Energy Commission (CEC), January 1980 - February 1981

Advisor to Commissioner. Wrote "California Electricity Needs," Chapter 1 of Electricity Tomorrow, part of the CEC's 1980 Biennial Report. Testified before California PUC and coauthored CEC staff brief on alternatives to the proposed 2500 megawatt Allen-Warner Valley coal project.

CEC, October 1977 - December 1979

Worked for CEC's Policy and Program Evaluation Office. Analyzed supply-side alternatives to the proposed Sundesert nuclear power plant and the proposed Point Concepcion LNG terminal. Was the CEC's technical expert in PG&E et. al. vs. CEC lawsuit, in which the U.S. Supreme Court ultimately upheld the CEC's authority to regulate nuclear powerplant siting.

Energy and Resources Group, U.C. Berkeley, Summer 1976

Developed a computer program to estimate the number of fatalities in the first month after a major meltdown accident at a nuclear power plant.

Federal Energy Agency (FEA), April- May 1976

Consultant on North Slope Crude. Where To? How?, a study by FEA's San Francisco office on the disposition of Alaskan oil.

Angeles Chapter, Sierra Club, September 1974 - August 1975

Reviewed EIRs and EISs. Chaired EIR Subcommittee of the Conservation Committee of the Angeles Chapter, January - August 1975.

Bechtel Power Corporation (BPC), June 1973 - April 1974

Planning and Scheduling Engineer at BPC's Norwalk, California office. Worked on construction planning for the Vogtle nuclear power plant (in Georgia).

Education

Energy and Resources Group, U.C. Berkeley, 1975 - 1977

M.A. in Energy and Resources. Two year master's degree program, with course work ranging from economics to engineering, law to public policy. Master's thesis on the causes of the 1972-77 boom in the price of yellowcake (uranium ore). Fully supported by scholarship from National Science Foundation.

University of California, San Diego, 1969 - 1973

B.A. in Mathematics. Graduated with honors. Junior year abroad at Trinity College, Dublin, Ireland.

Professional Publications

"Rate Making for Sales of Power to Public Utilities," with Michael D. Yokell, in Public Utilities Fortnightly, August 2, 1984.

EXHIBIT D

Re: Review of Mitigation Measures Proposed for Agriculture and Forestry Resources, Estrella Substation and Paso Robles Area Reinforcement Project DEIR

I. Mitigation Measure AG-1, "Provide Compensation for Loss of Agricultural Land"

A. The DEIR proposes a 1:1 ratio for land mitigation.

The placing of conservation easement at a 1:1 ratio to land permanently lost to agriculture is recognized in the DEIR to "not fully offset the significant impact because it does not create any new Important Farmland."

There are other jurisdictions and agencies that have struggled with this problem. Here are a few ways they have found to help on the offset not achieved by the 1:1 land mitigation.

1. Increase the ratio: Yolo County California, the City of Davis, and the City of Arroyo Grande all have mitigation ordinance requiring more than a 1:1 ration. See https://sustainablecitycode.org/brief/offsetting-agricultural-land-loss-stemming-from-new-development-3/#:~:text=The%20ordinance%20requires%20mitigation%20at%20a%203%3A1%20ratio,as%20affordable%20housin g%20projects%2C%20parks%2C%20and%20schools.%20T

2. Donate additional funds to a local land trust or the California Council of Land Trusts, whose mission is to preserve agricultural lands in California. The Land Trust of San Luis Obispo County is one of several land trusts active in the area of the project.

3. Implement one or more of the many strategies suggested in Agriculture and Land Stewardship Framework and Strategies, a guidebook published by California Department of Water Resources. This resource is dedicated to the preservation of agricultural land in California, and has many ideas that could be included in the Estrella mitigation proposal to help close the admitted gap between the significant loss of land and full mitigation.

B. The proposed land mitigation fee will be "based on market price for commensurate agricultural land."

1. **How is this to be done?** A licensed, certified appraiser should determine the price to be paid. "Commensurate" should be defined by metrics such as soil quality (Storie Index or USDA Capability Class rating) equivalent supply of water for irrigation, and other factors which are described and utilized in the LESA model. The mitigation land should have an equal or better LESA score than the land lost. Who monitors the mitigation – is it San Luis Obispo County, LAFCo, USDA Natural Resource Conservation Service, or the local Resource Conservation District?

2. The proposed land mitigation fee will be contributed to the California Farmland Conservancy Program.

I am not aware that the California Department of Conservation's California Farmland Conservancy Program is set up to receive agricultural land mitigation fees, and I have never understood this as its function. It is a grant program that awards grants to applicants for farmland conservation, but its funding comes from various state acts and bond funds. The California Department of Conservation's

Agricultural Land Mitigation Program (ALMP) does *partner* with local land trusts, cities, counties, resource conservation districts, and open-space districts to award grants, but my understanding is that the funding for these grants still comes from state and federal programs, and not directly from a mitigation fee from some CEQA triggering project such as the subject Estrella project.

Mitigation Proposal AG-1 therefore fall short of a thorough or even credible mitigation plan for the permanent loss of agricultural land from this project. To be effective, the plan should identify a legal entity that can receive the mitigation fees and utilize them for the intended purpose, to wit, to acquire a permanent conservation easement on "commensurate" land. This would be a local agricultural land trust, San Luis Obispo County, or one of the other entities mentioned above. Better yet, see No. 3, immediately below.

3. "In lieu" mitigation fees can be misused or misapplied

Contributing money in an amount commensurate with the value of the land lost is problematic in that there is no guarantee that the original intention of the mitigation can be postponed, lose its purchase power through time lapse and administration costs, or even be diverted to other uses. These effects have been seen throughout the country with in-lieu fees , and have been a ongoing criticism of in-lieu mitigation fees.

The best way to avoid these problems is to require that the DEIR directly identify and purchase the conservation easement with the oversight and approval of the appropriate jurisdiction (San Luis Obispo County?) This way the specific intent of the law can be met directly and effectively.

II. Mitigation Measure AG-2, "Restore Agricultural Land Temporarily Impacted by Construction Activities"

The activities are described as:

- temporary staging and storage areas
- installation of underground fiber optic cable
- installation of 230 kV interconnection structures
- preparation and temporary use of pull sites and crossing guard structures
- preparation and use of helicopter landing zones

and the mitigation is described as restoring the sites to pre-project conditions by:

- removal of rock or material imported to stabilize the site
- replacement of topsoil
- de-compacting any soil that has been compacted by heavy equipment
- replanting of agricultural crops

A. Commentary

Perhaps the most significant problem with this proposed mitigation measure is its almost complete lack of specificity as to how these measures will be accomplished. In all likelihood the real impacts are not fully known or understood, and this paragraph is just a cipher or placeholder to acknowledge that something will need to be done after the construction is completed. Below I will discuss the proposed

mitigation measures and offer commentary and suggestions. I will assume that the measures will be performed in the sequence as presented in the DEIR.

1. Removal of rock or material imported to stabilize the site
To fully remove these materials will require scraping into the topsoil, and thus remove some if not most of the native topsoil in the process. This is probably being acknowledged by the proposal to replace the topsoil. While it is theoretically possible to remove all the placed rock and other imported materials, in practice this is generally economically infeasible, and it may as well be acknowledged that a 95% cleanup job is about the best likely outcome, thus this aspect of the temporary construction will not be fully restored to pre-construction conditions.

2. Replacement of topsoil
As noted above, undoubtedly topsoil will be scraped away with the placed rock. The Soil Survey of San :Luis Obispo County, Paso Robles Area (USDA Soil Conservation Service, 1983) notes that the topsoil for the principle soils at theses sites is approximately 10 inches deep. Thus removal of even two inches of topsoil is a 20% loss, and in all likelihood about 4 inches 40%, will be scraped away. The plan does not state how the topsoil will be replaced, but assuming it will be purchased from a landscape materials yard somewhere in San Luis Obispo County, imported to the site and spread by dump truck, the replacement topsoil should match, as close as possible, the pale brown fine sandy loam found naturally at the various temporary construction sites. The amount of topsoil removed should be replaced by an equal amount, recognizing that when applied the topsoil will be unsettled and less compact than the original site condition; thus more appropriate topsoil should be applied than the amount measured as removed with the end result that the settled ten inches or so is replaced.

It is commonly known that just replacing topsoil with fresh fill is insufficient to restore a landscape to its original condition. Problems include soil erosion, lack of fertility, and a minimized soil biology. The plan should require that the soil be conditioned through re-establishment of ground vegetation at each site. This could be accomplished by planting a grass-forb-mix cover crop, with a species mix that is similar or identical to that which was removed. The Soil Survey describes the rangeland species as "soft chess, wild oats and burclover," but the DEIR gives a longer list of "non-native grasses" in section 4.4.3. In the tilled crop land areas, specific cover crops to condition the soil and provide other ecosystem services are warranted. It is common for the land between the vineyard rows to be planted to a variety of cover crop species; a description of this practice has been published by Cal Poly Center for Sustainability at https://cfs.calpoly.edu/cphealthysoils.

Note also that restoring soil to its pre-project condition will likely take more than one year to accomplish and a plan to monitor the site and continue with restoration practices for two to three years will probably be necessary to achieve the stated goal of restoring soil to its pre-project condition.

3. De-compacting soil that has been compacted by heavy equipment
Once the topsoil has been "replaced," but before planting cover crops or other vegetation, the plan calls for de-compacting the soil. No further description is provided, so I assume that the typical practice of using a crawler tractor or bulldozer fitted with ripper shanks is the proposed operation. To do this effectively, the compacted layer must be broken in several directions, and the ripper shank must penetrate to a depth slightly below the compacted zone. Monitoring of the efficacy of the operation is paramount if the compaction is to be remedied. This tillage should be done when the soil profile is dry enough to fracture; ripping in wet soil only causes additional damage. Again, ripping compacted soil is a standard practice and while it can't fully recreate the original conditions of a natural soil profile, ripping is the prescribed method to alleviate compacted soils. As with the top soil/vegetation/life-of-

the-soil aspect discussed earlier, time is required to bring the soil system back into balance and a semblance of what existed prior to the project activities. Establishing the vegetation is key to this re-balancing.

The tillage process of decompaction creates an erosion hazard by loosening the soil, breaking up soil aggregates, and altering its native physical structure. Because this land is sloping and has a light, loamy texture, the decompaction will aggravate the erosion hazard, especially in the rainy season. This is why a serious plan for cover cropping and restoration of the vegetation must be part of the plan to return the land to its pre-project condition.

The process of decompaction, either through ripping, chiseling or some other tillage method aerates the soil and stimulates microbial activity which in turn leads to a breakdown of soil organic matter (thus a loss of carbon in the soil) and a strong surge, or release of CO2 into the atmosphere. This effect is increased under wet soil conditions. The DEIR should be revised and recirculated to analyze the impacts from decompaction of soil on GHG emissions.

4. Replanting of agricultural crops

Annual crops such as hay or row crops are easy to restore in the sense that in one year the crop rotation can be put back into place. Even for the annual crops, however, the cover cropping immediately after (as a soil conditioner prior to planting the commercial agricultural crop) the "de-compacting" must be an added requirement to this mitigation plan.

For grape vineyards, the vines take more than one year to reach crop bearing age. It is therefore necessary for the mitigation that the act of replanting of the grape vines encompasses the several years (typically 3 to 5 years) it takes to develop mature grape vines. The University of California Cooperative Extension publishes studies on the costs to establish wine grape vineyards, and these studies can form an objective basis for the full cost and time period required for the replanting mitigation

5. Additional observations

a. Soil disturbance.

The degree of soil disturbance for each proposed project activity is not stated, and may actually be unknown at this time. Depending on the particular project operation, the depth of disturbance through excavation or severe compaction may make it impracticable to reasonably fully restore the so-disturbed site to pre-project conditions, and thus fail to mitigate these activities.

b. Hazardous materials.

There is no discussion of the use of hazardous materials on the temporary construction sites; however this is a real concern; prevention and containment measures must be part of the plan, along with contingency plans for hazardous waste cleanup if needed.

c. Restoration of slopes and contours.

The temporary construction sites are located on undulating land with slopes up to 15%, according to the Soil Survey. Such topography is prone to soil erosion from rainfall; the mitigation plan must restore the temporary construction sites to their original slopes and contours for proper surface water drainage. Drainage pipes and other conveyance or water calming structures may be required to prevent water erosion on sloping land. Satellite LIDAR mapping is likely available to establish the original slopes and contours.

Gregory A. House

Agricultural Consultant
Agronomist
Professional Farm Manager
Rural Appraiser
Farmer

Experience

Agricultural Consultant, House Agricultural Consultants, providing agricultural science, economics, management, and appraisal services, 1983–present

Farmer, 1987–present. Organic apples, peaches, cherries, apricots, field and seed crops

Corporation Secretary & Consulting Agronomist, Hannesson, Riddle & Associates, Inc., 1977–1983.

Professional Affiliations

- American Society of Farm Managers & Rural Appraisers
- American Society of Agronomy
- Crop Science Society of America
- Soil Science Society of America
- California Certified Organic Farmers
- California Farm Bureau

Accreditations

- Accredited Farm Manager (AFM), American Society of Farm Managers & Rural Appraisers, Certificate #501
- Certified Professional Agronomist (CPAg), American Registry of Certified Professionals in Agronomy, Crops. & Soils, Ltd. Certificate # 2319
- Certified Crop Advisor CCA), American Registry of Certified Professionals in Agronomy, Crops. & Soils, Ltd.
- Accredited Rural Appraiser (ARA), American Society of Farm Managers & Rural Appraisers, Certificate #749
- Certified General Appraiser, State of California License # AG 001999

  These credentials have continuing education requirements with which I am in compliance.

Qualifications of Gregory A. House, continued

Education

- B.S., Crop Ecology, University of California, Davis, 1975, with Honors
- Numerous courses from the University of California Extension in agricultural economics, crop management, real estate, & hazardous waste management
- Courses of the American Society of Farm Managers and Rural Appraisers:

  Principles of Rural Appraisal
  Advanced Rural Appraisal
  Eminent Domain
  Report Writing School
  Economics of Farm Management
  Principles of Farm Management
  Standards and Ethics
  Permanent Plantings Seminar
  Standards and Ethics for Farm Managers
  ASFMRA Code of Ethics
  National Uniform Standards of Professional Appraisal Practice

  Courses of the Appraisal Institute:

  Basic Valuation Procedures
  Real Estate Statistics and Valuation Modeling
  Advanced Income Capitalization
  Valuation of Conservation Easements Certificate Program
  Condemnation Appraising: Principles and Applications
  Appraising the Appraisal

Expert Witness Court Testimony

- Superior Court Qualified Expert Witness in the following California counties: Alameda, Colusa, Kern, Fresno, Madera, Merced, Monterey, Orange, Riverside, San Joaquin, San Luis Obispo, Santa Barbara, Santa Cruz, Solano, Sonoma, Sutter, Yolo
- United States Tax Court Qualified Expert Witness
- United States Bankruptcy Court Qualified Expert Witness

A list of depositions and trial appearances is available upon request

Qualifications of Gregory A. House, continued

Awards

- CCOF Presidential Award, California Certified Organic Farmers, February, 2001
- Meritorious Service in Communications, American Society of Farm Managers and Rural Appraisers, November 2004
- H.E. Buck Stalcup Excellence in Education Award, American Society of Farm Managers and Rural Appraisers, October, 2011

Appointments & Activities

- Adjunct Lecturer, Farm Management Courses ARE 140 & ARE 198, University of California, Davis, Department of Agricultural & Resource Economics, current
- Instructor, "Principles of Farm Management", an Internet course of the American Society of Farm Managers and Rural Appraisers, 1996 to 2007
- President, California Chapter American Society of Farm Managers & Rural Appraisers 1994–1995; Secretary-Treasurer, 1984 to 1990
- Board of Directors, Yolo Land Trust, 1993–2001
- Board of Directors, American Red Cross, Yolo County Chapter 1987–1989
- Member, Yolo County Right to Farm Grievance Committee 1992–1995
- Vice Chairman, Management Education Committee, American Society of Farm Managers and Rural Appraisers, 1998–2000 (committee member since 1986)
- Yolo County LAFCo Agricultural Forum LESA subcommittee, 1999
- California Certified Organic Farmers: Treasurer of the Board of Directors, 1998–2003; Executive Director, 1999-2000; Chairman of Certification Committee, Yolo Chapter, 1993-2005; Member of the Finance Committee, 1998-current
- CCOF Foundation Going Organic Program, Management Team member and Chapter Leader, 2006-current
- USDA Organic Grant Panel member, 2002
- City of Davis Open Space and Habitat Commission, 2006–current, Chairman, 2007-2009
- Member, Fruit Orchard Technical Advisory Group, Filoli Gardens, Woodside, California
- Member, Organic and Sustainable Agriculture Program Steering Committee, University of California Cooperative Extension, Yolo and Solano Counties, California, 2008-2013

Qualifications of Gregory A. House, continued

Speaking Engagements

- Guest Lecturer, University of California at Davis, Agricultural Economics 145, Farm and Rural Resources Appraisal, on professional farm appraisal (1985–1997)
- Guest Lecturer, University of California at Davis, Agricultural Economics Department, Course 140, "Farm Management", on adoption of new technologies, farm budgeting, cash flow management, cost accounting, etc. (1985–present)
- Guest Lecturer, University of Florida at Gainesville, Vegetable Crops Department, seminar on transition to organic agriculture, (November, 1994)
- Featured Program Speaker, 1995 Eco-Farm Conference, Asilomar, California , on economics of organic apple production
- Guest Speaker, Community Alliance with Family Farmers, on farm management and agricultural economics, 1996 and 1997
- Instructor, American Society of Farm Managers and Rural Appraisers, Course M-12, "Standards and Ethics for Professional Farm Managers", March, 1997
- Guest Speaker, American Horticultural Society, "Challenges of Organic Stone Fruit Production", Sacramento, California, July 2001
- Organizer and Presenter, Going Organic Kickoff Meetings, November 2005 and December 2006
- Master of Ceremonies, California Certified Organic Farmers, Annual Meeting, February, 2006, Sacramento, California
- Featured Program Speaker, 2012 Eco-Farm Conference, Asilomar, California, "Imitating Natural Systems: Towards an Indigenous Agro-forestry"
- Seminar presentation: "What Makes for Comparable Sales in Condemnation Appraisal" , Rpid Fire Seminar, American Society of Farm Managers and Rural Appraisers, Reno , NV, October 2013.

Publications

- "Principles of Farm Management", Course M-10, a 40-hour professional credit Internet educational offering of the American Society of Farm Managers & Rural Appraisers
- "Conservation Issues in Agriculture", a unit of Course M-25, a 15-hour professional credit Internet educational offering of the American Society of Farm Managers & Rural Appraisers
- "A Primer on Organic Agriculture," an article in *2006 Trends in Agricultural Land and Lease Values*, a publication of the California Chapter of the American Society of Farm Managers & Rural Appraisers
- "Case Study: Using Indigenous Agroforestry Management Techniques to Support Sustainability in Production Agriculture", a paper-poster presented at Harlan II, An International Symposium on Biodiversity in Agriculture: Domestication, Evolution and Sustainability, September 14-18, 2008, University of California, Davis

House Agricultural Consultants
Partial Listing of Clients Served

Allied Insurance Group

American Farmland Trust

Balverne Winery & Vineyards
Sonoma County, California

Bank of America

Best, Best & Kreiger, LLP
Riverside, California

California Giant Berry Farms

California Department of Fish & Game
Wildlife Conservation Board

California Department of Justice

City of Davis

City of Fairfield

City of Morgan Hill

City of Sacramento, City Attorney

Continental Casualty Company
Chicago, Illinois

County of Solano

County of Yolo

Downey, Brand, Seymour & Rohwer
Sacramento, California

Glenn-Colusa Irrigation District

Hamel Ranch Partnership
Davis, California

Harris Farms, Inc.

Farmers' Home Administration (U.S.D.A.)
Sacramento, California

Internal Revenue Service, District Counsel
San Francisco, California

McMahon-Graf Partners
Winters, California

Morrison & Foerster
San Francisco, California

Oakdale Irrigation District

Pajaro Valley Water Management Agency
Watsonville, California

Phillips 66 Company

Republic Indemnity Company of America
San Francisco, California

Royal & Sun Alliance

Sacramento Valley Conservancy

Sacramento Valley Farm Credit Banks

San Andreas Farms
Fresno County, California

San Joaquin Council of Governments

San Luis Delta Mendota Water Authority

Sanwa Bank, N.A.
Sacramento, California

Solano Land Trust

Stanford Management Company
Stanford University

The Nature Conservancy

The Prudential Agricultural Group
Sacramento, California

The Travelers Insurance Company

The Trust for Public Land

U. S. Fish & Wildlife Service

U. S. Departments of Justice & Treasury

University of California, Davis

Yolo Land Trust

Wells Fargo Bank, N.A.