DOCKETED	
Docket Number:	06-AFC-09C
Project Title:	Colusa Generating Station - Compliance
TN #:	258231
Document Title:	Gravel Replacement Project PTA
Description:	(PTA) - Gravel Replacement with Pervious Asphalt Pavement
Filer:	Anwar Ali
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	7/31/2024 10:14:58 AM
Docketed Date:	7/31/2024

Jacobs

Gravel Replacement with Pervious Asphalt Pavement

Pacific Gas and Electric Company
PG&E

Colusa Generation Station
May 29, 2024

Contents

Attachments

Tables

Figures

Acronyms and Abbreviations

AFC	Application for Certification
APCD	Air Pollution Control District
BMP	Best Management Practices
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CGS	Colusa Generating Station
COCs	Conditions of Certification
CRS	Cultural Resources Specialist
HRSG	Heat Recovery Steam Generator
LORS	Laws, Ordinances, Regulations, and Standards
PG&E	Pacific Gas and Electric Company
PRS	Paleontological Resources Specialist
SMAQMD	Sacramento Metropolitan Air Quality Management District

1. Introduction

1.1 Background

On April 23, 2008, the California Energy Commission (CEC) granted a license to Pacific Gas and Electric Company (PG&E) to construct and operate the Colusa Generating Station (CGS) located in Colusa County, California (Figure 1). The Final Decision was docketed on April 25, 2008, Docket Number 06-AFC-09C. On July 29, 2008, PG&E began construction of the CGS. CGS commenced commercial operation on December 22, 2010.

The following is a listing of the approved amendments to the CGS license.

- On July 16, 2009, the Commission approval a modification of the general arrangement which included eliminating the emergency diesel generator, the diesel fire pump, and the auxiliary boiler, moving the natural gas metering station, and adding a natural gas water bath heater system and a wet surface air cooler.
- On December 13, 2013, the CEC staff approved the removal of a clarifier from the water filtration process.
- On March 14, 2014, the CEC staff approved the storage of a spare three-phase, 265 MVA Generator Step-Up transformer on site.
- On April 8, 2014, CEC staff approved temporary truck water deliveries to the project site until a new alternate water supply pipeline could be constructed.
- On August 22, 2014, CEC staff approved construction of a new pipeline along the access road to withdraw water from Glen Colusa Irrigation District's Glen Colusa Canal.
- On April 22, 2015, CEC staff approved of petitions to install an air cooler on the heat recovery steam generator discharge; and to expand the deck grating area around the steam turbine.
- On December 15, 2015, the Commission approved a modification of the Air Quality Conditions of Certification to be consistent with CGS's Federal Title V Operating Permit.
- On October 17, 2016, CEC staff approved the addition of a warehouse and electrical equipment.
- On May 9, 2017, CEC staff approved the installation of rotating intake screens on the Tehama Colusa Canal intake structures and associated pumping equipment.
- On June 7, 2017, CEC staff approved the addition of a permanent stairway to the air-cooled condenser condensate return pumps.

1.2 Description of Proposed Project Action

The proposed action is to replace approximately 13,000 square feet (approximately 0.3 acres) of existing gravel south of the HRSG stacks within the CGS power block with pervious asphalt to facilitate maintenance activities onsite. The gravel replacement is expected to take approximately three months total, spread out through the rest of 2024 with a completion date by the end of 2024. The gravel, placed during the initial construction of the project, will be removed and spread within the CGS fence line in

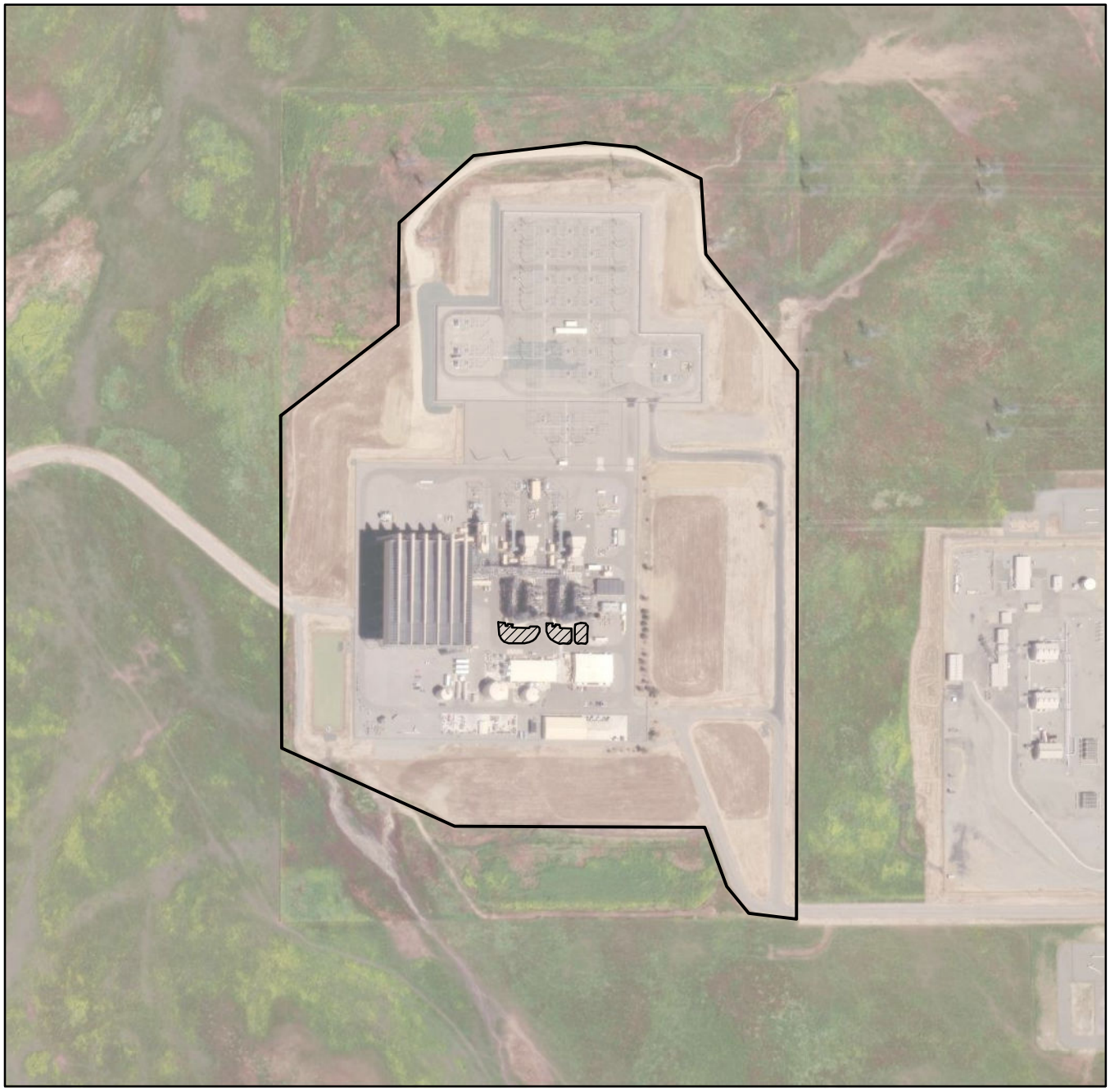
previously graveled areas. Then up to 14 inches of aggregate base will be installed/compacted, and a general contractor will install approximately 4 inches of pervious asphalt.

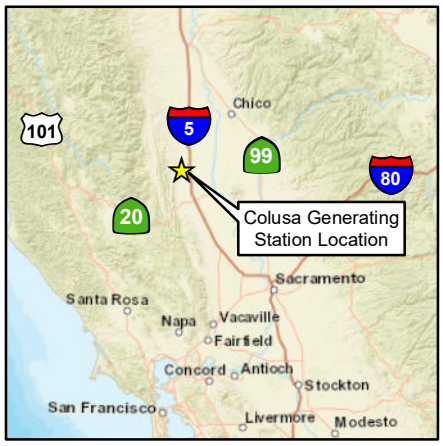
1.3 Necessity and Need of Proposed Action

Sections 1769 (a)(1) (B), and (C) of the CEC Siting Regulations require a discussion of the necessity for the proposed modification to the CGS project and whether the modification is based on information known by the petitioner during the certification proceeding. Replacement of the existing gravel with pervious asphalt was not known during the original proceeding. The replacement of the gravel with asphalt will improve equipment access in the area as well as mitigating trip and slip hazards on the uneven surface of the gravel. Additionally, the change to asphalt will reduce negative human-snake interactions as the snakes will be more visible on the asphalt versus blending in with the gravel.

1.4 Summary of Environmental Impacts and Consistency with License

Section 1769 (a)(1)(D) of the CEC Siting Regulations requires that an analysis be conducted to address impacts the proposed modification may have on the environment and proposed measures to mitigate any significant adverse impacts. Section 1769 (a)(1)(E) requires a discussion of whether the proposed modification affects the facility's ability to comply with applicable laws, ordinances, regulations, and standards (LORS). Section 1769(a)(1)(A) require a demonstration of the proposed actions consistency with the existing conditions of certification (COCs) for the CGS license or proposes new/modified COCs. Section 3 provides an environmental analysis of the proposed action and its consistency with COCs.





Legend

- CGS Boundary
- Proposed Paving Location

Version: 4/10/2024

N

0 500 1,000

Feet

Figure 1
Proposed Paving Project
Colusa Generating Station
Colusa, California

Jacobs

\\dc1vs01\gisproj\P\PGE\Colusa\GIS\MapFiles\2024\Paving_Locations_240409.mxd kgrant1 4/10/2024 2:01:52 PM

2. Description of Project Action

Consistent with the CEC Siting Regulations Section 1769(a)(1)(A), this section includes a description of the requested project modification, as well as the necessity for the modification. This section provides a summary of the analysis performed relative to this action and the license requirements (i.e., the COCs) contained in the Final Decision that pertain to this construction project.

2.1 Proposed Action

PG&E proposes to replace the existing gravel within the CGS plant site with pervious asphalt to enhance equipment access, reduce trip and fall hazards associated with uneven ground, and reduce negative human-snake interactions. The gravel replacement project will be completed before the end of 2024 and will occur within the existing CGS fence line. Figure 2 identifies the area where the gravel will be removed and replaced with pervious asphalt.[1] The total area of gravel replacement is approximately 13,000 square feet (approximately 0.3 acres). The existing gravel will be reused within the CGS fence line in areas previously graveled during construction. After the gravel is removed, up to 14 inches of Class 2 aggregate base will be placed and compacted, and up to 4 inches of pervious asphalt will be placed over the aggregate base. No excavation is expected to impact native soils.

The gravel replacement project will occur over the next few months and is anticipated to be complete by the end of 2024. The project will require an excavator, bobcat, dump truck, a roller, and a paving machine with approximately two workers to remove the gravel, place the Class 2 aggregate, compact the aggregate and placing down the pervious asphalt. Two trucks driven by the same two workers will also be used to move the existing gravel within the existing CGS fence line and it is anticipated that three daily truck trips during construction will be used to deliver the Class 2 aggregate to the site.

2.2 Permit Requirements

The COCs included in the CGS license, as amended, provide appropriate mitigation to ensure that project impacts are less than significant. All relevant COCs will be complied with as part of this project activity. As noted in the analysis contained in Section 3, no other permits are anticipated for this project. However, if a ministerial permit is needed—such as a Caltrans single-trip transportation permit to transport oversized or excessive loads over state highways—it will be obtained prior to transport of the equipment or materials. As the disturbance area will be less than 1 acre in size a construction stormwater pollution prevention plan will not be prepared, however all Best Management Practices (BMPs) within the existing operational stormwater pollution prevention plan for the CGS will be implemented.

[1] https://www.epa.gov/soakuptherain/soak-rain-permeable-pavement

3. Environmental Analysis of the Project Action

The proposed action is expected to have comparable or less environmental impacts then were originally analyzed by the CEC when it approved the project in April 2008. Based on the minimal nature of the proposed project, only impacts to air quality, biological resources, cultural resources, paleontological resources, and traffic and transportation are addressed in this PTA. The proposed action discussed in this document would not alter the operational impacts that were used as the basis to license the project during the original proceeding. Therefore, operational impacts are expected to be equal to, or less than, those analyzed in the Final Decision, as amended, and are not addressed in this petition.

3.1 Air Quality

An air quality assessment and associated modeling was conducted for the project and is provided as Attachment A, Air Quality Assessment for Gravel Replacement with Pervious Asphalt Pavement. As discussed in the assessment, potential impacts to air quality were evaluated based on the criteria pollutant and GHG emissions resulting from the proposed action. A project that generates emissions exceeding the applicable air district's thresholds of significance would be considered to have a significant impact on air quality and would require mitigation.

Table 3-1 presents the thresholds that were used for evaluating the project's significance as well as the project's construction emission estimates. The detailed CalEEMod report is provided in Attachment 1. Although the project is located within the jurisdiction of the Colusa County Air Pollution Control District (APCD), the Colusa County APCD does not have any published significance thresholds for use in California Environmental Quality Act (CEQA) evaluations. In the absence of Colusa County APCD CEQA significance thresholds, mass-based thresholds from the Sacramento Metropolitan Air Quality Management District (SMAQMD) were used instead (SMAQMD 2020b).[2]

Table 3-1. Comparison of the Project's Construction Emissions to the SMAQMD Thresholds of Significance

Pollutant	Thresholds of Significance	Project Construction Emissions [a]
ROG	None	0.72 pounds per day
CO	None [b]	6.34 pounds per day
NOx	85 pounds per day	5.83 pounds per day
SO_2	None [b]	0.02 pounds per day
PM_{10} [c]	80 pounds per day 14.6 tons per year	0.36 pounds per day 0.01 tons per year

[2] The use of significance thresholds from SMAQMD was considered appropriate based on the project's location within the Sacramento Valley.

$PM_{2.5}$ [c]	82 pounds per day 15 tons per year	0.23 pounds per day 0.01 tons per year
CO_2e	1,100 metric tons per year	50.8 metric tons per year

Notes:
[a] The Project Construction Emissions represent the maximum daily or total annual results from CalEEMod, depending on the pollutant and associated significance threshold.
[b] Although SMAQMD does provide concentration thresholds for CO and SO_2, comparison to those thresholds is not explicitly required by SMAQMD's CEQA guidelines (SMAQMD 2020a), particularly if the project's emissions do not otherwise exceed the available mass-based significance thresholds.
[c] The Project's PM_{10} and $PM_{2.5}$ emissions are based on the sum of exhaust and fugitive particulate emissions.

As demonstrated in Table 3-1, NOx, PM10, PM2.5, and CO2e emissions generated by the proposed action are expected to be less than the applicable thresholds of significance. As a result, the proposed action at the CGS site is not expected to have a significant impact on air quality and will not require mitigation beyond any best management practices recommended by the Colusa County APCD for minimizing fugitive dust.

3.1.1 Mitigation Measures

To minimize construction impacts to a less-than-significant level, the relevant COCs (particularly AQ-SC1 through AQ-SC5) will be implemented for all construction and demolition activities. Therefore, this action will not create a significant air quality impact.

3.1.2 Consistency with LORS

The 2008 Commission Decision approving CGS found the project to be in compliance with all applicable LORS (CEC, 2008). This proposed action is in compliance with all applicable LORS.

3.1.3 Conditions of Certification

The gravel removal and pervious asphalt replacement will not require changes to the COCs, the Final Determination of Compliance, or require additional COCs for air quality.

3.2 Biological Resources

A habitat assessment survey was conducted to confirm the habitat present at the site and determine the potential for special-status wildlife and plants present at the site. The proposed Project consists of a "developed" land cover type and is within the CGS. This area, which consists mostly of paved surfaces, gravel, and industrial structures, has generally low habitat value for special status wildlife or plant species. Development or paving of the areas on site at CGS that are currently covered in gravel is unlikely to have significant or measurable adverse effects to special status species wildlife or plants and is further discussed in Attachment B, CGS Habitat Survey Assessment Report.

3.2.1 Mitigation Measures

The licensing of CGS includes adequate mitigation measures in the 2008 Commission Decision (CEC, 2008). To minimize impacts to biological resources to a less-than-significant level, the relevant COCs (particularly BIO-1 through BIO-6) will be implemented. Therefore, this action will not create a significant biological resources impact.

3.2.2 Consistency with LORS

The 2008 Commission Decision approving CGS found the project to be in compliance with all applicable LORS (CEC, 2008). This proposed action at CGS is expected to comply with all applicable LORS.

3.2.3 Conditions of Certification

Replacement of the gravel with pervious asphalt will not require changes to the COCs or require additional COCs for biological resources.

3.3 Cultural Resources

The project is not expected to impact native soils or historic resources. Therefore, the proposed action is not expected to affect cultural resources, and no permits are required. Based on a conversation with CEC cultural resources staff, an updated literature search was not warranted.

All construction workers will be given Worker Environmental Awareness Training (per CUL-5) so they will be familiar with cultural resources and know what to do in the event a potential resource is discovered during construction. Prior to construction, the name and resume of a Cultural Resources Specialist (CRS) will be provided to the CEC for approval. As the gravel was initially placed on top of engineered fill during construction of the CGS, removal of the gravel is not anticipated to impact native soils, and therefore an onsite cultural resource monitor is not warranted during removal activities. However, in the event activity occurs within native soils during gravel removal the CRS will be notified and will remain on-call in the event of a find.

3.3.1 Mitigation Measures

To minimize construction impacts to a less-than-significant level, the relevant COCs, particularly CUL-1, CUL-3, CUL-5, CUL-7, (and CUL-2, if needed) will be implemented for all construction activities. Therefore, this action will not create a significant cultural resources impact.

3.3.2 Consistency with LORS

The 2008 Commission Decision approving CGS found the project to be in compliance with all applicable LORS (CEC, 2008). This proposed action at CGS is expected to comply with applicable LORS.

3.3.3 Conditions of Certification

Replacement of the gravel with pervious asphalt will not require changes to the COCs or require additional COCs for cultural resources because potential impacts were considered in the development of the COCs during the original licensing process and no new impacts, that have not already been considered, would be created.

3.4 Paleontological Resources

The proposed project is expected to occur entirely within the existing CGS fence line and is not expected to impact native soils. Therefore, impacts to paleontological resources are not expected.

3.4.1 Mitigation Measures

To minimize construction impacts to a less-than-significant level, the relevant COCs (PAL-1 though PAL-7) will be implemented for all construction activities. A Paleontological Resources Specialist (PRS) will be approved and a PRS or Paleontological Monitor will be on-call during construction activities that disturb native soils. Therefore, this action will not create significant Paleontological Resource impacts.

3.4.2 Consistency with LORS

The 2008 Commission Decision approving CGS found the project to be in compliance with all applicable LORS (CEC, 2008). This proposed action at CGS is expected to comply with applicable LORS.

3.4.3 Conditions of Certification

The proposed action will not require changes to the COCs or require additional COCs because potential impacts were considered in the development of the COCs during the original licensing process and no new impacts, that have not already considered, would be created.

3.5 Traffic and Transportation

The proposed action will require a maximum of two workers total for gravel replacement and asphalt installation, with approximately three daily truck trips required to move gravel and deliver the Class 2 aggregate and pervious asphalt.

Because of the short construction period, the rural nature of the Project area, and the lack of traffic congestion, no traffic and transportation impacts are expected. In addition, the proposed Project modification will comply with applicable LORS.

3.5.1 Mitigation Measures

To minimize construction impacts to a less-than-significant level, the relevant COCs (particularly TRANS-1 though TRANS-3) will be implemented for all construction activities. Therefore, this action will not create a significant traffic and transportation impacts.

3.5.2 Consistency with LORS

The 2008 Commission Decision approving CGS found the project to be in compliance with all applicable LORS (CEC, 2008). This proposed action is expected to comply with applicable LORS.

3.5.3 Conditions of Certification

The proposed action will not require changes to the COCs or require additional COCs for traffic and transportation because potential impacts were considered in the development of the COCs during the original licensing process and no new impacts, that have not already been considered, would be created.

4. Proposed Modifications to the Conditions of Certification

Consistent with the requirements of the CEC Siting Regulations Section 1769 (a)(1)(A), this section addresses any proposed modifications to the project's Conditions of Certification. No changes to the COCs are required for the proposed action. In addition, no other permits will be required.

5. Potential Effects on the Public, Property Owners, and Residents

The CEC Siting Regulations Section 1769(a)(1)(H), requires the project owner address any potential effects a proposed project modification may have on nearby property owners, the public, and residents.

This action would have minimal/temporary impacts on nearby property owners, the public, and residents. Consistent with the CEC Siting Regulations Section 1769(a)(1)(G), a list of property owners adjacent or near the proposed project will be provided under separate cover.

6. California Environmental Quality Act Exemptions

The CEC Siting Regulations Section 1769(a)(1)(I), requires the project owner address any exemptions to the California Environmental Quality Act.

There are no applicable exemptions from the California Environmental Quality Act.

7. References

California Energy Commission (CEC). 2007. Colusa Generating Station (06-AFC-9C) Final Staff Assessment (CEC-700-2007-003-FSA). November.

CEC. 2008. Final Commission Decision for the Colusa Generating Station (06-AFC-9C). April.

ENVIRON. 2013. *CalEEMod User's Guide*. October.

URS Corporation (URS). 2001. Application for Certification for Colusa Power Plant Project, Colusa County, California. June.

_____. 2006. Application for Certification for Colusa Generating Station, Colusa County, California, prepared for E&L Westcoast, LLC. Volume I and Volume II (Appendices). November.

_____. 2007. Proposed Modifications to Glenn-Colusa Canal Bridge Design for Colusa Generating Station. August. Submitted to CEC docket unit on August 17, 2007.

Attachment A
Air Quality Assessment for Gravel Replacement with Pervious Asphalt Pavement

Air Quality Assessment for Gravel Replacement with Pervious Asphalt Pavement

Date:	May 13, 2024
Project name:	Colusa Generating Station
Project no:	D31321EL
Attention:	Pacific Gas & Electric Company
Prepared by:	Melanie Dickison/Jacobs
Copies to:	Elyse Engel & Jerry Salamy/Jacobs

Jacobs Project Management Co.
1737 North First Street
Suite 350
San Jose, CA 95112
United States
T +1.408.436.4936
www.jacobs.com

Introduction

On April 23, 2008, the California Energy Commission (CEC) granted a license to Pacific Gas and Electric Company (PG&E) to construct and operate the Colusa Generating Station (CGS) located in Colusa County, California. The Final Decision was docketed on April 25, 2008, Docket Number 06-AFC-09C. On July 29, 2008, PG&E began construction of the CGS. CGS commenced commercial operation on December 22, 2010.

Jacobs Engineering Group Inc. (Jacobs) has been contracted to support PG&E with preparing a Petition to Amend (PTA) the Final Decision to obtain the CEC's review and approval of proposed modifications to the project site. Specifically, the proposed action is to replace approximately 13,000 square feet of existing gravel within the CGS power block with pervious asphalt to facilitate maintenance activities onsite. The gravel replacement is expected to be complete by the end of 2024. The gravel, placed during the initial construction of the project, will be removed and redistributed in other areas onsite. Then up to 14 inches of aggregate base will be installed/compacted, and a pervious asphalt contractor will install approximately 4 inches of pervious asphalt.

This technical memorandum presents an assessment of potential air quality impacts associated with the proposed action, based largely on an estimate of air emissions associated with the proposed construction activity.

Methodology

Onsite and offsite project emissions were divided into two categories: vehicle and construction equipment exhaust and fugitive dust from vehicle and construction equipment, including material movement (e.g., excavation and truck loading/unloading). The following criteria pollutant emissions were estimated: reactive organic gases (ROG), carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide (SO_2), particulate matter having an aerodynamic equivalent diameter of 10 microns or less (PM_{10}), and particulate matter having an aerodynamic equivalent diameter of 2.5 microns or less ($PM_{2.5}$). Greenhouse gas (GHG) emissions were also estimated in the form of carbon dioxide equivalent (CO_2e).

Fugitive dust, construction equipment exhaust, and vehicle exhaust emissions were estimated using the California Emissions Estimator Model (CalEEMod; version 2022.1.1.21). CalEEMod is a statewide computer model developed by ICF, in collaboration with the Sacramento Metropolitan Air Quality Management District, that "provides a simple and integrated platform to quantify construction and operations emissions, assess climate hazards and vulnerabilities, identify environmental burdens, and evaluate

benefits of various emission reduction, climate risk reduction, and health and equity measures" (ICF 2022). CalEEMod incorporates the California Air Resources Board's (CARB) emission factor models for off-road construction equipment (OFFROAD2017; version 1.0.1) and on-road vehicles (EMFAC2021, version 1.0.1) as well as portions of the U.S. Environmental Protection Agency's (EPA) *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors*.

Data and Assumptions

To the extent possible, site-specific data were used as input to CalEEMod. Site-specific data were obtained from the PTA, as provided by PG&E. Where site-specific data were not available, conservative assumptions were made based on the project description. Defaults provided within CalEEMod for the project location were assumed representative unless otherwise noted. The following subsections describe the data entered into CalEEMod. Note that data related to operation, vegetation, climate risk, health and equity, demolition, electricity consumption, and architectural coatings were not entered or updated, if defaults were available, because these activities are neither expected as part of this project nor relevant to the current assessment. Therefore, any emissions estimates associated with these activities were disregarded in the model output.

Project Characteristics

The project location was selected based on the CGS site address, which is located in Colusa County, California. The county selection dictated the wind speed, precipitation frequency, and land use used within CalEEMod.

Land Use

It was assumed that a General Light Industrial land use category would best represent the CGS site. The project area assigned to this land use category was set equal to the construction area associated with the proposed action (13,000 square feet or 0.298 acres). Gravel excavation, aggregate material installation, and paving activities are all expected to occur within this footprint.

Construction

Schedule. The project is expected to occur intermittently over several months, with a total duration not to exceed 3 months' worth of construction days. Although project activities are expected to occur intermittently over the project duration, the emission model estimates conservatively assumed that the project would occur during three consecutive months with activities split between an assumed 2-month Grading Phase for the excavation of existing gravel and installation of imported aggregate and an assumed 1-month Paving Phase for the placement of pervious asphalt. The project duration was arbitrarily assigned to begin in October 2024, assuming construction activities would occur 5 days per week, resulting in a total of 66 construction workdays between the two construction phases.

Off-road Equipment. The anticipated heavy equipment used during the proposed project includes an excavator, bobcat, paver, roller, and dump truck. The following modifications and assumptions were made to the anticipated equipment to accommodate entry into CalEEMod:

- The bobcat was assumed to be best represented by the Tractors/Loaders/Backhoes category.
- The dump truck was assumed to be best represented by the Off-Highway Trucks category.
- It was assumed that all equipment used during the Grading and Paving Phases would operate an average of 8 hours per day over the 66-day construction period.

- The CalEEMod default horsepower ratings and load factors were assumed appropriate for equipment selected.
- Only the paver and roller were assumed to operate during the Paving Phase, with all other equipment operating during the Grading Phase.

Material Movement. Material movement during the Grading Phase includes gravel excavation and placement elsewhere onsite as well as the import and installation of aggregate. Data entry associated with material exports represents volumes of gravel excavated and spread elsewhere onsite. It was conservatively assumed that gravel would be excavated at a depth of up to 18 inches over the entire 13,000-square foot project area, for a total excavated volume of approximately 722 cubic yards. A volume of 1,444 cubic yards was entered into CalEEMod assuming the same volume of gravel (722 cubic yards) was first loaded (following excavation) and then unloaded elsewhere onsite. Material imports represent volumes of aggregate hauled to the site and subsequently unloaded. A volume of 563 cubic yards was entered into CalEEMod based on a 13,000-square foot surface area and 14-inch depth.

Paving. During the Paving Phase, it was assumed that the entire area of the proposed action (0.298 acres) would be paved with 100 percent pervious asphalt.

Trips and Vehicle Miles Traveled. For both the Grading and Paving Phases, 4 one-way trips per day for worker commutes was included in CalEEMod based on the assumption that there would be up to 2 workers onsite each day during the project duration. For the Grading Phase, a total of 3 haul truck roundtrips per day for material imports is expected. This results in a total of approximately 132 haul truck roundtrips for delivering asphalt and compact material to the site. The project is not expected to include any vendor deliveries or onsite truck trips. CalEEmod default one-way trip lengths of 14.9 miles for worker commutes and 20 miles for haul truck trips were assumed representative for this project in the absence of project-specific information.

Results

Potential impacts to air quality were evaluated based on the criteria pollutant and GHG emissions resulting from the proposed action. A project that generates emissions exceeding the applicable air district's thresholds of significance would be considered to have a significant impact on air quality and would require mitigation.

Table 1 presents the thresholds that were used for evaluating the project's significance as well as the project's construction emission estimates. The detailed CalEEMod report is provided in Attachment 1. Although the project is located within the jurisdiction of the Colusa County Air Pollution Control District (APCD), the Colusa County APCD does not have any published significance thresholds for use in California Environmental Quality Act (CEQA) evaluations. In the absence of Colusa County APCD CEQA significance thresholds, mass-based thresholds from the Sacramento Metropolitan Air Quality Management District (SMAQMD) were used instead (SMAQMD 2020b).[1]

Table 1. Comparison of the Project's Construction Emissions to the SMAQMD Thresholds of Significance

Pollutant	Thresholds of Significance	Project Construction Emissions [a]

[1] The use of significance thresholds from SMAQMD was considered appropriate based on the project's location within the Sacramento Valley.

ROG	None	0.72 pounds per day
CO	None [b]	6.34 pounds per day
NOx	85 pounds per day	5.83 pounds per day
SO_2	None [b]	0.02 pounds per day
PM_{10} [c]	80 pounds per day 14.6 tons per year	0.36 pounds per day 0.01 tons per year
$PM_{2.5}$ [c]	82 pounds per day 15 tons per year	0.23 pounds per day 0.01 tons per year
CO_2e	1,100 metric tons per year	50.8 metric tons per year

Notes:
[a] The Project Construction Emissions represent the maximum daily or total annual results from CalEEMod, depending on the pollutant and associated significance threshold.
[b] Although SMAQMD does provide concentration thresholds for CO and SO_2, comparison to those thresholds is not explicitly required by SMAQMD's CEQA guidelines (SMAQMD 2020a), particularly if the project's emissions do not otherwise exceed the available mass-based significance thresholds.
[c] The Project's PM_{10} and $PM_{2.5}$ emissions are based on the sum of exhaust and fugitive particulate emissions.

As demonstrated in Table 1, NOx, PM_{10}, $PM_{2.5}$, and CO_2e emissions generated by the proposed action are expected to be less than the applicable thresholds of significance. As a result, the proposed action at the CGS site is not expected to have a significant impact on air quality and will not require mitigation beyond any best management practices recommended by the Colusa County APCD for minimizing fugitive dust.

References

ICF. 2022. *CalEEMod User's Guide*. April.

Sacramento Metropolitan Air Quality Management District (SMAQMD). 2020a. *Guide to Air Quality Assessment in Sacramento County*. Chapter 3, Construction-generated Criteria Air Pollutant and Precursor Emissions. April. https://www.airquality.org/LandUseTransportation/Documents/Ch3Construction4-30-2020.pdf.

Sacramento Metropolitan Air Quality Management District (SMAQMD). 2020b. *SMAQMD Thresholds of Significance Table*. April. https://www.airquality.org/LandUseTransportation/Documents/CH2ThresholdsTable4-2020.pdf.

Attachment 1. CalEEMod Report

Colusa PTA Detailed Report

Table of Contents

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Colusa PTA
Construction Start Date	10/1/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.90
Precipitation (days)	34.2
Location	39.364211528143414, -122.2639318319209
County	Colusa
City	Unincorporated
Air District	Colusa County APCD
Air Basin	Sacramento Valley
TAZ	228
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.22

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Light Industry	13.0	1000sqft	0.30	13,000	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.72	5.83	6.34	0.02	0.20	0.16	0.36	0.19	0.04	0.23	2,263	0.08	0.08	2,290
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.11	0.86	0.96	< 0.005	0.03	0.02	0.05	0.03	0.01	0.04	303	0.01	0.01	307
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.02	0.16	0.18	< 0.005	0.01	< 0.005	0.01	0.01	< 0.005	0.01	50.2	< 0.005	< 0.005	50.8

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.72	5.83	6.34	0.02	0.20	0.16	0.36	0.19	0.04	0.23	2,263	0.08	0.08	2,290

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.11	0.86	0.96	< 0.005	0.03	0.02	0.05	0.03	0.01	0.04	303	0.01	0.01	307
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.02	0.16	0.18	< 0.005	0.01	< 0.005	0.01	0.01	< 0.005	0.01	50.2	< 0.005	< 0.005	50.8

3. Construction Emissions Details

3.1. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	5.25	6.02	0.02	0.20	—	0.20	0.18	—	0.18	1,799	0.07	0.01	1,805
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.63	0.73	< 0.005	0.02	—	0.02	0.02	—	0.02	217	0.01	< 0.005	218
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.12	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	35.9	< 0.005	< 0.005	36.0
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	42.6	< 0.005	< 0.005	43.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.56	0.10	< 0.005	0.01	0.11	0.12	0.01	0.03	0.04	422	< 0.005	0.07	442
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	5.30	< 0.005	< 0.005	5.37
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.07	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	50.8	< 0.005	0.01	53.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.88	< 0.005	< 0.005	0.89
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	8.42	< 0.005	< 0.005	8.82

3.3. Paving (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.30	2.54	3.07	< 0.005	0.13	—	0.13	0.12	—	0.12	457	0.02	< 0.005	459
Paving	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.15	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	27.6	< 0.005	< 0.005	27.7
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	4.56	< 0.005	< 0.005	4.58
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	42.6	< 0.005	< 0.005	43.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	2.65	< 0.005	< 0.005	2.69
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.44	< 0.005	< 0.005	0.44
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Grading	Grading	10/1/2024	11/30/2024	5.00	44.0	—
Paving	Paving	12/1/2024	12/31/2024	5.00	22.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Grading	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Grading	Off-Highway Trucks	Diesel	Average	1.00	8.00	367	0.40
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Rollers	Diesel	Average	1.00	8.00	36.0	0.38

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Grading	—	—	—	—
Grading	Worker	4.00	14.9	LDA,LDT1,LDT2
Grading	Vendor	—	10.8	HHDT,MHDT
Grading	Hauling	6.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	4.00	14.9	LDA,LDT1,LDT2
Paving	Vendor	—	10.8	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Grading	563	1,444	0.00	0.00	—
Paving	0.00	0.00	0.00	0.00	0.30

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Light Industry	0.30	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	204	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	25.5	annual days of extreme heat
Extreme Precipitation	3.75	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	11.3	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	1	0	0	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	0	0	N/A
Flooding	0	0	0	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	1	1	1	2
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	1	1	2
Flooding	1	1	1	2
Drought	1	1	1	2

Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	29.9
AQ-PM	3.66
AQ-DPM	4.19
Drinking Water	18.5
Lead Risk Housing	50.9
Pesticides	86.9
Toxic Releases	6.15
Traffic	1.60
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	35.0
Haz Waste Facilities/Generators	1.80
Impaired Water Bodies	91.9

Solid Waste	96.2
Sensitive Population	—
Asthma	37.8
Cardio-vascular	64.2
Low Birth Weights	33.4
Socioeconomic Factor Indicators	—
Education	71.9
Housing	6.89
Linguistic	51.1
Poverty	65.8
Unemployment	36.4

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	40.95983575
Employed	8.417810856
Median HI	33.79956371
Education	—
Bachelor's or higher	27.07558065
High school enrollment	100
Preschool enrollment	36.28897729
Transportation	—
Auto Access	59.70742974
Active commuting	32.24688823
Social	—

2-parent households	54.6002823
Voting	85.33299115
Neighborhood	—
Alcohol availability	67.84293597
Park access	8.520467086
Retail density	0.30796869
Supermarket access	7.339920441
Tree canopy	56.39676633
Housing	—
Homeownership	64.41678429
Housing habitability	88.60515848
Low-inc homeowner severe housing cost burden	94.37957141
Low-inc renter severe housing cost burden	83.11305017
Uncrowded housing	47.8121391
Health Outcomes	—
Insured adults	35.51905556
Arthritis	0.0
Asthma ER Admissions	64.9
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	37.6
Cognitively Disabled	39.7
Physically Disabled	2.1

Heart Attack ER Admissions	31.2
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	1.1
SLR Inundation Area	0.0
Children	25.4
Elderly	11.1
English Speaking	72.2
Foreign-born	10.2
Outdoor Workers	9.7
Climate Change Adaptive Capacity	—
Impervious Surface Cover	91.1
Traffic Density	1.7
Traffic Access	0.0
Other Indices	—
Hardship	66.5
Other Decision Support	—
2016 Voting	76.6

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	34.0
Healthy Places Index Score for Project Location (b)	38.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Three month project duration assumed to be split between a Grading Phase (2 months) for the excavation of existing soils and gravel in addition to a Paving Phase (1 month) for the placement of permeable asphalt.
Construction: Off-Road Equipment	Expected project equipment includes an excavator, bobcat, and dump truck for the Grading Phase, as well as a roller and paver for the Paving Phase. All equipment assumed to operate for 8 hours per day.
Construction: Trips and VMT	Two workers expected to drive to/from the site daily. 132 total truck trips for material imports is expected for the project during the Grading Phase. Assumed 6 one-way truck trip per day during this phase.

Construction: Paving	Project site expected to be 13,000 square feet (0.298 acres), with gravel excavation, aggregate installation, and permeable asphalt placement throughout.
Construction: Dust From Material Movement	Material imports and exports were assumed to only occur during the Grading Phase.

Attachment B
CGS Habitat Survey Assessment Report

Colusa Generating Station (CGS) Habitat Survey Assessment Report

Date:	May 29, 2024
Project Name:	Colusa Generating Station Paving Project
Project No:	D31321EL
Attention:	Josh Harris, CGS Senior Manager
Client:	Pacific Gas & Electric
Prepared By:	Scott Lindemann, Danny Rivas
Reviewed By:	Jerry Salamy

Jacobs Engineering Group Inc.
155 Grand Avenue
Suite 800
Oakland, CA 94612
United States
T +1.510.251.2426
F +1.510.451.5507
www.jacobs.com

Introduction

Pacific Gas and Electric (PG&E) is preparing a Petition to Amend (PTA) the existing California Energy Commission (CEC) license for PG&E's Colusa Generating Station (CGS). The PTA is to pave approximately 0.3 acres of existing graveled areas within the power block with pervious asphalt to facilitate maintenance activities onsite.

A habitat assessment survey was conducted to confirm the habitat present at the site and determine the potential for special-status wildlife and plants present at the site. Jacobs biologist Danny Rivas conducted the habitat assessment on February 7, 2024. This memorandum presents the methods and results of the surveys.

Project Location

The CGS site is located approximately four miles west of Interstate 5, seven miles northwest of Maxwell, in Colusa County, California. The plant is immediately west of PG&E's Delevan Natural Gas Compressor Station on Dirks Road. The power plant site is in the eastern half of Section 35, Township 18 North, Range 4 West, and is in the Sites USGS 7.5-minute quadrangle map.

Background

The CGS was constructed on what was historically California annual grassland and alkali grassland habitat communities. These areas were developed with the CGS operational in December 2010.

Habitat

The existing CGS project area can be classified as "developed." The CGS consists of approximately 18 acres of the power plant and associated support buildings, plus approximately 11 acres electrical substation, located immediately adjacent to the CGS.

The heat recovery steam generators (HRSG) and other industrial structures present at the site have provided roosting and nesting habitat for non-native, invasive bird species including rock pigeon (*Columba livia*) and Eurasian collared dove (*Streptopelia decaocto*). Other native bird species including house finch (*Haemorhous mexicanus*) and Brewer's blackbird (*Euphagus cyanocephalus*) also use these

industrial buildings or other structures for roosting and occasionally nesting. These birds are present during the bird breeding season (approximately starting in early February to late August).

The habitat immediately surrounding and adjacent to CGS, but outside of the fenceline, is undeveloped annual grassland. This area (not owned or controlled by the PG&E) is characterized by annual grassland habitat that is mowed and disced annually for fire prevention, paved and unpaved roads, the 11-acre Delevan Switchyard substation, and rock slope protection (RSP) on some existing minor slopes. The annual grassland areas are treated with herbicide in some areas. Cattle also graze some areas of the grassland adjacent to the CGS.

Proposed Project

The proposed action is to replace approximately 13,000 square feet (approximately 0.3 acres) of existing gravel within the CGS fenceline with pervious asphalt to facilitate maintenance activities onsite. The gravel replacement is expected to be completed by the end of 2024. The gravel, placed during the initial construction of the project, will be removed and placed on other existing graveled areas within the fenceline. Up to 14 inches of aggregate base will then be installed/compacted, and a pervious asphalt contractor will install approximately 4 inches of pervious asphalt.

Methods

Jacobs biologist Danny Rivas (a designated Biological Monitor for the CGS) surveyed the CGS interior area to assess the habitat quality of the graveled areas proposed for asphalt paving. The survey was conducted on February 7, 2024 as a pedestrian wandering transect survey for wildlife habitat and native vegetation in or near the approximately 0.3-acre graveled project area. Mr. Rivas surveyed the project site from 12:00 PM-13:00PM and photo-documented the planned gravel areas for asphalt paving. Site photos are provided as Attachment A. Resumes are provided as Attachment B.

Results

Survey Results

Weather during the survey included temperatures ranging from 42 to 49° Fahrenheit, a 5-15 mile-per-hour easterly wind, 100% cloud cover, and light precipitation from 8:00-13:00. Pooling from a recent rainstorm was also observed at some of the proposed gravel areas (see Photo 4 in Attachment A).

The CGS site is either paved or covered in gravel, and no native soils were present on site. A few ruderal plants were observed near a drainage hole in a gravel patch next to the CGS employee paved parking lot (see Photo 3 in Attachment A).

No special status species, bird nests, or burrows were detected in the project area.

During the survey, human presence in the gravel areas was low, consisting of occasional foot traffic. Disturbances from power generation at the site consisted mainly of the noise created by the ACC north of the contractor gravel parking lot and at the HRSGs.

Limitations to Survey Accuracy

Strong morning winds (10-15 mph) and light precipitation from 8:00AM – 12:00PM may have limited the potential for birds and other wildlife to be detected within the Project area. However, given the lack of habitat within the survey area this was unlikely to affect the accuracy of the survey. Mr. Rivas did not survey the annual grassland habitats or disturbed grassland habitats outside the CGS fenceline.

Discussion

The proposed Project area consists of a "developed" land cover type, and is within an operational gas-fired electrical generating plant. This area, which consists mostly of paved surfaces, gravel, and industrial structures, has generally low habitat value for special status wildlife or plant species. Development or paving of the areas on site at CGS that are currently covered in gravel is unlikely to have significant or measurable adverse effects to special status species wildlife or plants.

Attachment A
Site Photos

Photograph 1:

Representative site photo showing pavement, industrial structures, and gravel with a drainage inlet. Photo taken at 39.365491°, -122.270241° (WGS 84) on February 7, 2024. Facing northeast.

Photograph 2:

Representative site photo showing pavement, east side of the administration building, and gravel with a drainage culvert. Photo taken at 39.365473°, -122.268917° (WGS 84) on February 7, 2024. Facing south.

Photograph 3:

Representative site photo showing ruderal plants present at gravel area near CGS staff parking lot at 39.365011, -122.269062° (WGS 84). on February 7, 2024. Facing east.

Photograph 4:

Pooling in gravel areas immediately following a rainstorm. Photo taken at 39.365538, -122.269440 (WGS 84) on February 7, 2024. Facing northeast.

Attachment B
Resumes

EDUCATION/QUALIFICATIONS

Ecology and Evolutionary Biology, B.S., University of California, Merced, 2018

REGISTRATIONS | CERTIFICATIONS

Geological Information Systems (GIS) Certificate, 2019, Extension and International Programs, California State University, Fullerton, CA

MEMBERSHIPS AND AFFILIATIONS

OC Habitats, 2018 - 2022

TRAINING

OSHA 10-hour Construction Safety and Health, 2021

LANGUAGES

Fluent in Spanish

Danny Rivas

BIOLOGIST

Danny is a wildlife biologist with a bachelor's degree in Ecology and Evolutionary Biology and over two and a half years of professional experience. He has experience utilizing research techniques in a fieldwork setting for conducting biological resource surveys and in assembling biological field data. Danny has provided biological support and consulting for various construction projects in the Southern and Northern California area. His skill set includes wildlife surveys and handling, field data collection, construction monitoring, working outside for extended periods of time, and fluency in Spanish.

Areas of Expertise

- Scientific Writing
- Wildlife Surveys
- Habitat Mapping
- Wildlife Capture, Handling, and Relocation

Employment History

- January 2021 to present, Jacobs Engineering Group, Inc., Biologist
- May 2020 to November 2020, First Carbon Solutions (FCS), Biologist

Relevant Project Experience

Los Angeles–Regional Interoperable Communications System (LA-RICS) Land Mobile Radio Project, Angeles National Forest and Catalina Island, CA

Client: LA-RICS

Title: Biologist

Start/End Dates: May 2020 - April 2022

Scope/Description: The LA-RICS Land Mobile Radio (LMR) network aims to replace the current radio networks in Los Angeles County with an up-to-date network solely for first responders. The benefits of a new LMR system can receive large amounts of data between safety agencies without communication delays or crashes. The LMR project consisted of 63 fixed LTE towers and 15 temporary sites across Los Angeles County to provide 4G coverage from AT&T.

Responsibilities: Conducted construction monitoring and biological assessments for several LA-RICS sites in the Angeles National Forest and Catalina Island. Performed pre-construction surveys, nesting bird surveys, nest monitoring, and special status species surveys in chaparral shrubland and oak woodland environments. Collaborated with on-site contractors, Jacobs environmental planners, archeologists, and project managers to ensure construction activity remained in compliance with permitted mitigation measures.

Burlington Northern Santa Fe (BNSF) Needles Third Main Track Expansion Project, Needles, CA

Client: Burlington Northern Santa Fe (BNSF) Railway

Title: Biologist

Start/End Dates: January 2022 - April 2022

Scope/Description: The purpose of Third Main Track (3MT) Project in Needles is to connect Chicago to California's seaports and support supply services. Sections 1 and 2 of the 3MT expansion consisted of 30 miles of track, 50 railroad bridges, and 80 culvert extensions from Goff's to Needles. The goal of these sections is to aid with service operations heading in and out of Needles, CA.

Responsibilities: Tracked and monitored activity along the right of way (ROW) construction area and surveyed the perimeter daily for wildlife, such as active desert tortoise burrows and bird nests. Coordinated with three Jacobs biologists to ensure heavy equipment activity along the 30-mile project length was monitored and documented. Assisted in the construction of desert tortoise enclosures and handled wildlife relocations.

Long Beach Airport (LBG) Reconstruct Taxiway L Project, Long Beach, CA

Client: Long Beach Airport

Title: Project Inspector

Start/End Dates: May 2022 – August 2022

Scope/Description: The reconstruction project for Long Beach Airport (LGB) Taxiway L serves to rehabilitate the asphalt pavement using concrete and making improvements towards pavement markings, lighting, signage, and drainage system. The FAA primarily funded the $25 million project to bring the airport up to the latest FAA and safety standards for commercial aircraft use.

Responsibilities: Collaborated daily with a team of four QA project inspectors and project manager in inspecting taxiway reconstruction in line with FAA specifications. Communicated with on-site contractors on construction activity and status. Wrote daily reports on labor, equipment, activity with photo documentation, and provided detailed notes. Collected electrical quantities and escorted site visitors when needed.

Pacific Gas and Electric (PG&E) Colusa Generating Station (CGS) Environmental Support and Snake Mitigation, Colusa, CA

Client: PG&E

Title: Biologist

Start/End Dates: September 2022 – Current

Scope/Description: A CEC Condition of Certification (COC) BIO-2 for PG&E's operation of the CGS and GGS energy centers requires regular surveys, monitoring and reporting. Jacobs has provided multi-year environmental compliance support to PG&E in support of its CEC facility certification.

Responsibilities: California Energy Commission (CEC)-approved Biological Monitor at PG&E's Colusa Generating Station (CGS) and Gateway Generating Station (GGS) energy centers. Performed on-call environmental support including venomous snake capture and relocation, nesting bird surveys, bird nest monitoring, and bat identification. Reported to and coordinated permit compliance with PG&E CGS compliance manager (CM). Authored nine-page annual biological compliance reports summarizing on site surveys performed by CEC approved biologists in compliance with CEC requirement of Condition of Certification (COC) BIO-2.

Pacific Gas and Electric (PG&E) Community Wildfire Safety Program (CWSP) System Hardening Undergrounding (SHURG)

Client: PG&E

Title: Contract Land Planner

Start/End Dates: March 2023 – Current

Scope/Description: CWSP System Hardening aims to convert 10,000 miles of overhead distribution powerlines underground in or near high-fire risk areas as part of a multiyear effort. Undergrounding the electrical system will reduce wildfires caused by equipment, reduce power outages, improve reliability, decrease the need for tree work, and protect the environment.

Responsibilities: PG&E approved contract land planner (CLP) supports and coordinates with subject matter experts (SME) and contractors in identifying constraints and environmental requirements. CLP regularly communicates with environmental team and updates project reviews and records from Salesforce. CLP generates environmental release to construction (ERTC) documents from SME approved measures for system hardening construction compliance. Provides additional support through site walks, biological monitoring, and nesting bird surveys.

Observation and Handling Experience

Bird Experience:

- Western snowy plover (WSPL): Observed and monitored adults, fledglings, and nest sites for disturbances from Seal Beach to Huntington Beach as a monitor volunteer under OC Habitats (2018-2022).
- California least tern (CLTE): Observed and monitored breeding adults, fledglings, and nests sites for disturbances at Huntington Beach's Least tern preserve under California State Parks - Orange Coast District Department of Parks and Recreation (2019).
- California condor (CACO): Observed a trio of CACO at LA-RICS Whitaker Peak site on 02/11/2021. Monitored for CACO during tower construction in Angeles National Forest (2020-2022).
- Burrowing owl (BUOW): Observed at PG&E CGS site in Colusa during site survey on 02/10/2023. Performed BUOW surveys with Jacobs Biologist Scott Lindemann at Viracocha wind farms on 06/27/2023 and 06/29/2023. Observed multiple BUOW and pellets during surveys.

- Coastal California gnatcatcher (CAGN): Observed at LA-RICS BKK Landfill site in West Covina, adjacent to Galster Wilderness Park on 08/19/2021.
- Swainson's hawk (SWHA): Observed and photographed during SWHA surveys with Jacobs Biologist Scott Lindemann for the Sutter Energy Carbon Capture Project on 05/19/2023.
- Performed nesting bird surveys in developed and undeveloped areas in Los Angeles County and Norther California region from (2018-Current)
- Performed 19 ten-hour days of construction monitoring in California Ridgeway's rail (CRRA) salt marsh habitat at Petaluma River (2024)

Reptile Experience:

- Desert tortoise (DT): Monitored the excavation of potential DT burrows under BNSF 3MT Expansion Project in Needles, CA. Assisted in the construction of desert tortoise enclosures and borrows (2022).
- Giant garter snake (GGS): Observed and photographed a GGS with Jacobs Biologist Rick Crowe at Teresa Creek, Colusa on 06/07/2022.
- Western diamond rattlesnake: Observed, handled, and relocated multiple rattlesnakes at PG&E CGS. (2023)

Amphibian Experience:

- California red-legged frog (CRLF): Observed and photographed multiple CRLF tadpoles at Viracocha Wind farm during burrowing owl surveys with Jacobs Biologists Scott Lindemann and Sean O'Neal on 06/29/2023.
- California tiger Salamander (CTS): Observed and photographed multiple CTS larvae at Viracocha Wind farm during burrowing owl surveys with Jacobs Biologists Scott Lindemann and Sean O'Neal on 06/29/2023.

Mammal Experience:

- Catalina Island fox (CIF): Reported observations of CIF at Catalina Island across all three LA-RICS sites (2020-2022). Coordinated with the client to remove potential hazards and attractants that pose a potential threat to CIF within the site area (2021-2022).
- Salt marsh harvest mouse (SMHM): Conducted construction monitoring for SMHM at Sonoma creek for Ignacio Mare Island 115 kV Tower Replace Phase II Project (50 hours, 2022).
- Bat Species: Surveyed for live and dead bats at CGS, provided species identification and data collection. Handled a live bat (*Myotis* sp.) under the supervision of Designated Biologist Scott Lindemann on 09/28/2022 (2022-current).
- Handled and removed deer mice and shrews from pitfall traps at CGS.

Insect Experience:

- Valley elderberry longhorn beetle VELB: monitored outfall pipe construction at Yuba City Wastewater Treatment Facility (WWTF) in the riparian forest habitat near Feather River. Elderberry shrubs were present within the project work area (2023).

EDUCATION/QUALIFICATIONS

Certified Wildlife Biologist®, 2022, The Wildlife Society

Master of Wildlife Conservation, 2018, University of Maine, Orono

Environmental Studies, B.A., 2013, University of Southern California

MEMBERSHIPS AND AFFILIATIONS

The Wildlife Society, Since 2014. SF Bay Area Chapter Conservation Affairs Committee Chairman 2024-Present, Chapter Historian 2015-2017.

OTHER

- Over eight years of biological consulting experience
- Joined Jacobs in March 2019
- Oakland, California

Scott Lindemann

BIOLOGIST

Scott is a well-rounded wildlife biologist with a Master of Wildlife Conservation degree and over eight years of professional biological consulting experience. He has experience providing support for a wide variety of clients across industries, from linear projects in transportation or energy sectors to the support of private clients or local governments. His skillset includes project management, permitting, technical scientific research and field work, and staff coordination and training.

Scott has cultivated an in-depth knowledge of the flora and fauna of California and produces technical deliverables on schedule and within budget. Scott has supported clients by writing a wide variety of permit applications and status reports for CDFW, RWQCB, USACE, USFWS, NMFS, and California Coastal Commission (CCC). He also has in-depth field survey skills, having led protocol-level surveys for Swainson's hawk (SWHA) and burrowing owl (BUOW); conducted aquatic surveys for California red-legged frog (CRLF) and California tiger salamander (CTS); and assisted in protocol-level surveys for foothill yellow-legged frog (FYLF) and northern spotted owl (NSO). Recently Scott has also developed experience with wildlife crossing work. He has ensured permit compliance on over 60 project sites and monitored construction of wetland mitigation sites, including extensive experience monitoring in sites along the San Francisco Bay with California Ridgway's rail (RIRA), California black rail (CBR), and salt-marsh harvest mouse (SMHM).

Areas of Expertise

Field Experience: Conducted habitat and vegetation assessments, pre-activity surveys, and 120+ nesting bird surveys in a variety of North American ecosystems, with emphasis on California. Ensured permit compliance on 65+ project sites and monitored construction of a wetland mitigation site. Monitored in sites with high potential for California red-legged frog (CRLF), California tiger salamander (CTS), western pond turtle (WPT), Swainson's hawk (SWHA, burrowing owl (BUOW), California Ridgway's rail (RIRA), California black rail (CBR), and salt-marsh harvest mouse (SMHM).

Permitting Experience: Wrote a wide variety of permit applications and status reports for California Department of Fish and Wildlife (CDFW), United States Army Corps of Engineers (USACE), United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Energy Commission (CEC), Regional Water Quality Control Boards (RWQCB), and California Coastal Commission (CCC). Led agency field visits for client projects to plan permitting strategy.

Scientific Writing Experience: Prepared 120+ biological reports for client projects across Northern California. Published six scholarly journal articles.

Scientific Collecting Permit: Authorized Individual under the Jacobs Engineering General Use Scientific Collecting Permit, GW-183240001-18324-002, Scott Lindemann: SC-191020009

Relevant Project Experience

Linear Project Environmental Support, California

Client: Confidential Client

Title: Biologist

Start/End Dates: June 2014 – February 2017; March 2019-Present

Scope/Description: Biological Support for Operations and Maintenance Projects

Responsibilities: Project manager for two projects, environmental compliance lead biologist for two additional projects, and supported a variety of other linear projects. Ensured permit compliance during construction monitoring in a variety of sensitive habitat types. Coordinated activities of biologists in the field. Conducted construction monitoring for Ridgway's rail, California black rail, and salt marsh harvest mouse, for activities in or near tidal marsh around the San Francisco Bay. Ensured permit compliance through construction monitoring in areas with high potential for SCLTS in Aptos, California. Key roles include conducting biological surveys, performing permit compliance during construction, writing and reviewing biological reports, scheduling staffing, budgeting, proposal writing, and staff training.

Roadway Maintenance Environmental Support, Northern California

Client: Transportation-Sector Client

Title: Biologist

Start/End Dates: March 2019-Present

Scope/Description: Biological Support for Operations and Management Projects

Responsibilities: Met regularly with the client to provide project status updates and discuss permitting strategy. Prepared deliverables including permit applications, scientific literature reviews, and biological resource reports. Provided budget and schedule analysis for multiple projects. Coordinated the activities, deliverables, and budgets of subconsultants. Conducted project site visits and habitat assessments, wrote biological reports, and assisted in aquatic resource delineations (a.k.a. wetland delineations). Led a wildlife crossing study for a culvert replacement project. Led over 30 protocol-level surveys for Swainson's hawk (SWHA). Ensured permit compliance during construction monitoring in a variety of sensitive habitat types. Monitored for California red-legged frog (CRLF), California tiger salamander (CTS), and western pond turtle (WPT).

Wind Turbine Environmental Support, Northern California

Client: Confidential Client

Title: Biologist

Start/End Dates: December 2019-Present

Scope/Description: Biological Support

Responsibilities: Supported permitting including field surveys, technical report writing, and permit application writing. Performed aquatic dipnet/seine surveys for California tiger salamander and California red-legged frog to support the establishment of a conservation easement. Acted as lead field biologist for biological construction monitoring. Relocated California tiger salamander away from the work area during construction monitoring activities an agency-approved biological monitor. Performed burrowing owl and raptor surveys. Performed Stormwater Pollution Prevention Plan (SWPPP) inspections.

Culvert Replacement Project Environmental Support, Santa Clara County, California

Client: Confidential Client

Title: Project Manager, Biologist

Start/End Dates: November 2019-March 2020, July 2022-Present

Scope/Description: Biological and Permitting Support

Responsibilities: Project manager and lead biologist for two projects. Prepared proposal and secured contract. Conducted aquatic resource delineation, wrote delineation report, completed land-cover mapping, and prepared mitigation opportunities technical report.

Power Plant Support

Client: Confidential Clients

Title: Biologist

Start/End Dates: September 2019-Present

Scope/Description: Biological Support for Operations and Maintenance

Responsibilities: California Energy Commission (CEC)-approved Designated Biologist (DB) at three energy centers; Alternate Designated Biologist at the one energy center; and Biological Monitor at one energy center. Performed environmental support including venomous snake capture and relocation, nesting bird surveys, bird nest monitoring, providing Worker Environmental Awareness Training (WEAT) to crew, and other as-needed activities. Also provided permitting support for planned expansion of carbon capture and storage unit.

Data Center Construction Environmental Support, San Jose, California

Client: Confidential Client

Title: Biologist

Start/End Dates: June 2019-July 2022

Scope/Description: Biological Site Assessment and Permitting Support

Responsibilities: Conducted habitat assessments and wrote biological resources section of a Small Power Plant Exemption (SPPE) permit

application document. Supported permitting through the Santa Clara Valley Habitat Plan (SCVHP). Led protocol-level burrowing owl surveys.

Operations and Maintenence Environmental Support, Aptos, CA

Client: Confidential Client

Title: Biologist

Start/End Dates: March-August 2020

Scope/Description: Biological Support

Responsibilities: Assisted in pitfall trapping research for Santa Cruz long-toed salamander (SCLTS). Became proficient in SCLTS identification and understanding of SCLTS ecology. Ensured permit compliance through construction monitoring in areas with high potential for SCLTS.

Publications

Lindemann, S., D. Putnam, M. Hunter, Jr, and T. Persons. 2020. Spotted burnsi pattern in Northern Leopard Frog (*Lithobates pipiens*) in Maine. Canadian Field Naturalist 133(3):193-195.

Lindemann, S., A. O'Brien, T. Persons, and P. DeMaynadier. 2020. Axanthism in Green Frog (*Lithobates clamitans*) and American Bullfrog (*Lithobates catesbeianus*) in Maine. Canadian Field Naturalist 133(3):196-198.

Lindemann, S., and A. O'Brien. 2019. Geographic distribution: USA, Maine: *Hyla versicolor* (Gray Treefrog). Herpetological Review 50:97.

Lindemann, S., A. O'Brien, and D. Putnam. 2019. Geographic distribution: USA, Maine: *Lithobates pipiens* (Northern Leopard Frog). Herpetological Review 50:97.

Lindemann, S., A. O'Brien, and D. Putnam. 2019. Geographic distribution: USA, Maine: *Chelydra serpentina* (Snapping Turtle). Herpetological Review 50:99.

Lindemann, S., and A. O'Brien. 2019. Geographic distribution: USA, Maine: *Sternotherus odoratus* (Eastern Musk Turtle). Herpetological Review 50:101.

Additional Classes and Certifications

Biological Skills:

Army Corps of Engineers 40-Hour Wetland Delineation and Waters of the U.S. Training: Richard Chin Environmental Training (February 2014); California Tiger Salamander Workshop: Elkhorn Slough Coastal Training Program (May 2015); Workshop on the Biology and Management of the California Red-Legged Frog: Alameda County Conservation Partnership and Los Vaqueros Reservoir and Watershed (April 2014); Endangered Species Regulation: UC Davis Extension (February 2014); Introduction to Geographic Information Systems: Elkhorn Slough Coastal Training Program and UC Santa Cruz (May 2015).

Safety-Related:

40-Hour OSHA HAZWOPER: Compliance Solutions (May 2020, Recertified Annually); 8-Hour OSHA Supervisor Training (April 2023); Jacobs 8-Hour Safety Liaison Training (April 2023); Jacobs Field Quality Manager (July 2023); 10-Hour OSHA Construction Safety Training: ClickSafety (March 2023); Pipeline Construction Safety Training: BuildForce Canada/Northern Regional Construction Association (August 2019); 8-Hour Wilderness First Aid Class: Primary Care Consultants (April 2018); 16-Hour Wilderness First Aid Class: Foster Calm First Aid (February 2014); Bear Awareness Safety Course: Energy Safety Canada (August 2019); Energy Sector Driver Training: Fleet Safety International (July 2019); Workplace Hazardous Materials Information System Training: Danatec Educational Services Ltd. (August 2019).