

### 3.7 GREENHOUSE GAS EMISSIONS

#### 3.7.1 INTRODUCTION

This section discusses potential greenhouse gas (GHG) emissions associated with the project construction, operation, and maintenance, and concludes that impacts will be less than significant. GHG emissions were calculated and reported in CO<sub>2</sub> equivalents (CO<sub>2</sub>e) for carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), and methane (CH<sub>4</sub>) emissions from on-road, off-road, and helicopter emissions resulting from fuel combustion. Additionally, operational emissions of sulfur hexafluoride (SF<sub>6</sub>) associated with potential leakage from gas-insulated switchgear at the Fitch Mountain Substation are estimated. The implementation of the Applicant-Proposed Measure(s) (APMs) described in Section 3.7.4.2, as well as those described in Section 3.3, Air Quality, will further reduce less-than-significant impacts.

The project’s potential effects on GHG emissions were evaluated using the criteria set forth in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. The conclusions are summarized in Table 3.7-1 and discussed in more detail in Section 3.7.4.

**Table 3.7-1: CEQA Checklist for Greenhouse Gas Emissions**

Would the project:	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### 3.7.2 REGULATORY BACKGROUND AND METHODOLOGY

##### 3.7.2.1 Regulatory Background

###### **Federal**

The Supreme Court decision in *Massachusetts et al. v. Environmental Protection Agency et al.* (Supreme Court Case 05-1120) found that the United States Environmental Protection Agency (USEPA) has the authority to list GHGs as pollutants and to regulate emissions of GHGs under the federal CAA. On April 17, 2009, USEPA found that CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride may contribute to air pollution and may endanger public health and welfare. The USEPA has established reporting regulations that require specific facilities and industries to report their GHG emissions annually.

###### 40 CFR Part 98. Mandatory Reporting of Greenhouse Gases Rule.

This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO<sub>2</sub>e emissions per year.

40 CFR Part 52. Proposed Prevention of Significant Deterioration and Title V

**Greenhouse Gas Tailoring Rule.** USEPA has mandated that Prevention of Significant Deterioration (PSD) and Title V requirements applies to facilities whose stationary source CO<sub>2</sub>e emissions exceed 100,000 tons per year.

**Utility Air Regulatory Group v. EPA, 134 S. Ct. 2427 (2014).** On June 23, 2014, the Supreme Court ruled that PSD could not be triggered solely by GHG emissions, and has directed EPA to amend the Tailoring Rule.

This project is not impacted by these regulations.

**State**

In 2006, the California State Legislature signed the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32), which provides the framework for regulating GHG emissions in California. This law requires the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. The statewide 2020 emissions limit is 427 million metric tons CO<sub>2</sub>e.

State Executive Order S-3-05 established GHG reduction targets for the state of California. The targets called for a reduction of GHG emissions to 2000 levels by 2010; a reduction of GHG emissions to 1990 levels by 2020; and a reduction of GHG emissions to 80 percent below 1990 levels by 2050. The California Environmental Protection Agency secretary is required to coordinate development and implementation of strategies to achieve the GHG reduction targets.

Part of CARB's direction under AB 32 was to develop a scoping plan that contains the main strategies California will use to reduce GHG emissions that cause climate change. The scoping plan includes a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program.

CARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions came into effect in January 2009. However, this project is not impacted by these regulations and does not require mandatory reporting.

CARB published a Preliminary Draft Staff Proposal titled *Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act* in October 2008 that included a proposal that non-transportation-related sources with GHG emissions less than 7,000 metric tons of CO<sub>2</sub>e per should be presumed to have a less-than-significant impact.

On December 30, 2009, the California Resources Agency adopted amendments to the CEQA guidelines to include analysis of GHG emissions in CEQA documents, deferring significance thresholds to the lead agency. The amendments became effective on March 18, 2010.

A regulation for reducing SF<sub>6</sub> emissions from gas-insulated switchgear was implemented as part of AB 32, mandating utility-wide reduction of SF<sub>6</sub> emissions to a 1 percent leak rate by 2020.

### **Regional**

The California Air Pollution Control Officer's Association has established the Greenhouse Gas Reduction Exchange (GHG R<sub>x</sub>) for greenhouse gas emission credits in California. Credits listed on the GHG R<sub>x</sub> come from voluntary emission reduction projects and can be purchased to offset GHG emissions.

Local air districts act under state law and their discretionary requirements apply to PG&E utility projects.

The project is located within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD) and the Northern Sonoma County Air Pollution Control District (NSCAPCD). The BAAQMD and NSCAPCD are the regional agencies charged with preparing, adopting, and implementing emission control measures and standards for stationary sources of air pollution pursuant to delegated state and federal authority within their respective jurisdictions.

Neither the BAAQMD nor the NSCAPCD recommend GHG thresholds of significance. The BAAQMD adopted the *BAAQMD CEQA Guidelines* in December 1999 to assist local jurisdictions and lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality. The BAAQMD CEQA Guidelines were updated in June 2010, and again in May 2011, to include reference to thresholds of significance adopted by the BAAQMD. On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance. As a result, the BAAQMD has been ordered by the court to set aside the June 2010/May 2011 thresholds of significance, and is no longer disseminating them or recommending that they be used as a generally applicable measure of a project's significant air quality impacts. Instead, lead agencies may continue to rely upon the BAAQMD's 1999 thresholds of significance and may continue to make determinations on significance based on substantial evidence in the record. Lead agencies may also rely on the BAAQMD's current CEQA Air Quality Guidelines (updated in May 2012) for assistance in calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures (BAAQMD 2012).

Lastly, the BAAQMD adopted the *Bay Area 2010 Clean Air Plan (CAP)* on September 15, 2010. The Bay Area 2010 CAP provides an integrated, multi-pollutant control strategy to reduce emissions and decrease ambient concentrations of harmful pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily impacted by air pollution; and reduce GHG emissions to protect the climate (BAAQMD 2010).

The NSCAPCD indicated that BAAQMD guidelines are sufficient for this project and declined to provide additional guidelines.

## **Local**

Because the California Public Utilities Commission (CPUC) has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local (i.e., city and county) discretionary regulations.

### **3.7.2.2 Methodology**

Short-term construction emissions of CO<sub>2</sub>e were evaluated. Detailed construction emissions calculations, including the assumptions employed, are presented in Appendix C: Greenhouse Gas Calculations. Construction emissions were estimated using the *California Emissions Estimator Model Version 2013.2.2* (CalEEMod), with the exception of helicopter emissions, which were estimated manually using emissions factors obtained from the California Climate Action Registry and data from the Swiss Federal Office of Civil Aviation (FOCA).

Long-term operational emissions of CO<sub>2</sub>e were also evaluated. These emissions are a result of potential leakage from SF<sub>6</sub>-insulated circuit breakers. Detailed operational emissions calculations are also presented in Appendix C. Operational emissions associated with inspections and ongoing maintenance activities (primarily associated with periodic maintenance vehicle travel) were not estimated, as these activities are part of PG&E's ongoing operations, and will not change as a result of the project.

GHG emission calculations in this document were based on worst-case estimates of emissions to ensure presentation of a conservative environmental analysis. This analysis may be revised, as needed, to reflect changes to the project plans.

## **3.7.3 ENVIRONMENTAL SETTING**

### **3.7.3.1 Regional Setting**

GHGs are global concerns, unlike criteria air pollutants or toxic air contaminants that are of regional and/or local concern. Scientific research indicates that observed climate change is most likely a result of increased GHG emissions associated with human activity. Global climate change describes a collection of phenomena, such as increasing temperatures and rising sea levels, occurring across the globe due to increasing anthropogenic emissions of GHGs. GHGs contribute to climate change by allowing ultraviolet radiation to enter the atmosphere and warm the Earth's surface, but also prevent some infrared radiation from the earth from escaping back into space. The largest anthropogenic source of GHGs is the combustion of fossil fuels, which result primarily in CO<sub>2</sub> emissions.

As defined in AB 32, "greenhouse gas" or "greenhouse gases" include, but are not limited to CO<sub>2</sub>, CH<sub>4</sub>, nitrogen oxides (NO<sub>x</sub>), hydrofluorocarbons, perfluorocarbons, and SF<sub>6</sub>. In California, the transportation sector is the largest emitter of GHGs (CARB 2010b).

The BAAQMD has established a climate protection program to reduce air pollutants that affect public health and reduce emissions of GHG. The program includes measures to promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy.

### **3.7.4 APPLICANT-PROPOSED MEASURES AND POTENTIAL IMPACTS**

The following sections describe significance criteria for GHG emission impacts derived from Appendix G of the CEQA Guidelines, provide APMs, and assess potential project-related construction and operational air quality impacts.

#### **3.7.4.1 Significance Criteria**

According to Section 15002(g) of the CEQA Guidelines, “a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project.” As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. CEQA allows for significance criteria established by the applicable air pollution control district(s) to be used to assess the impact of a project related to GHG emissions, at the discretion of the CEQA Lead Agency.

Some California air districts, such as Monterey Bay Unified, San Luis Obispo County, Ventura County, South Coast, and San Diego County, have adopted, or have recommended for adoption, a significance threshold of 10,000 metric tons CO<sub>2e</sub> per year for stationary source projects. This threshold was derived from emissions data from the four largest air districts in California and is based on the Executive Order S-3-05 GHG emissions reductions goal of 80 percent below 1990 levels by 2050, which is roughly equivalent to 90 percent below current levels by 2050. This emissions reduction goal goes beyond the AB 32 emissions reduction goal established for 2020. The emissions data suggests that approximately 1 percent of all stationary sources emit greater than 10,000 metric tons CO<sub>2e</sub> per year and are responsible for 90 percent of GHG emissions. This significance threshold represents a capture rate of 90 percent of all new and modified stationary source-related projects. A 90 percent emissions capture rate means 90 percent of the total emissions from all new or modified stationary source projects would be subject to analysis in an environmental impact report prepared pursuant to CEQA, including analysis of feasible alternatives and imposition of feasible mitigation measures.

As noted above, this GHG significance threshold is intended for long-term operational GHG emissions associated with stationary sources; none of the air districts mentioned above have adopted or have recommended GHG significance thresholds for construction emissions. Therefore, in recent CEQA documents, the CPUC has elected to use an approach to the determination of significance of GHG construction emissions based on guidance developed by the South Coast Air Quality Management District (SCAQMD). For construction-related GHGs, SCAQMD recommends that total emissions from construction be amortized over 30 years and added to operational emissions, and then compared to the operation-based significance threshold of 10,000 metric tons CO<sub>2e</sub> per year.

Per Appendix G of the CEQA Guidelines, the potential significance of the project’s GHG emissions was evaluated for each of the criteria listed in Table 3.7-1, as discussed in Section 3.7.4.3.

### 3.7.4.2 Applicant-Proposed Measures

PG&E will implement the following APMs:

#### **Construction**

##### *APM GHG-1 Minimize GHG Emissions*

- Minimize unnecessary construction vehicle idling time per APM AIR-2.
- Maintain construction equipment per APM AIR-2.
- Minimize construction equipment exhaust by using low-emission or electric construction equipment where feasible. Portable diesel fueled construction equipment with engines 50 horsepower or larger and manufactured in 2000 or later will be registered under the CARB Statewide Portable Equipment Registration Program.
- Minimize welding and cutting by using compression of mechanical applications where practical and within standards.
- Encourage the recycling of construction waste where feasible.

#### **Operation and Maintenance**

Operation and Maintenance (O&M) of the project will have less-than-significant GHG-related impacts. PG&E will continue to employ standard Best Management Practices—such as minimizing vehicle trips and keeping vehicles and equipment well maintained—during operations, and will comply with CARB Early Action Measures (CARB 2015) as these policies become effective. PG&E will also implement the following APM that is specifically related to avoiding and minimizing potential SF<sub>6</sub> emissions:

##### *APM GHG-2: Minimize SF<sub>6</sub> Emissions*

- Incorporate the new circuit breakers at Fitch Mountain Substation into PG&E's system-wide SF<sub>6</sub> emission reduction program. CARB has adopted the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas-Insulated Switchgear (sections 95350 to 95359, title 17, California Code of Regulations), which requires that the company-wide SF<sub>6</sub> emission rate not exceed 1 percent by 2020. Since 1998, PG&E has implemented a programmatic plan to inventory, track, and recycle SF<sub>6</sub> inputs, and inventory and monitor system-wide SF<sub>6</sub> leakage rates to facilitate timely replacement of leaking breakers. PG&E has improved its leak detection procedures and increased awareness of SF<sub>6</sub> issues within the company. X-ray technology is now used to inspect internal circuit breaker components to eliminate dismantling of breakers, reducing SF<sub>6</sub> handling and accidental releases. PG&E is an active member of USEPA's SF<sub>6</sub> Emission Reduction Partnership for Electrical Power Systems.
- Require that the new circuit breakers at Fitch Mountain Substation have a manufacturer's guaranteed maximum leakage rate of 0.5 percent per year or less for SF<sub>6</sub>.

- Maintain the new substation circuit breakers in accordance with PG&E’s maintenance standards.
- Comply with CARB Early Action Measures as these policies become effective.

### 3.7.4.3 Potential Impacts

Potential project impacts related to GHG emissions were evaluated against the CEQA significance criteria and are discussed in further detail in the following paragraphs. The impact analysis evaluates potential project impacts during the construction phase and the O&M phase. Similar to the SCAQMD’s recommended approach for construction emissions discussed in Section 3.4.7.1, this analysis amortizes the construction emissions over a 30-year project lifetime, then compares those emissions to the significance threshold of 10,000 metric tons CO<sub>2e</sub> per year.

The project includes reconductoring existing 60 kV and 230 kV electric utility lines between Fulton Substation and Fitch Mountain #1 Tap. As part of the project, two motor-operated switches at Fitch Mountain Substation will be replaced with two SF<sub>6</sub> breakers. The O&M activities required for the reconducted power line and transmission line will not increase from those currently required for the existing system; thus, no operation-related impacts will occur from those activities. Therefore, with the exception of addressing potential SF<sub>6</sub> emissions associated with replacement breakers, the impact analysis is focused only on construction activities that are required to install the new conductor, replace or remove poles, perform minor substation modifications, and establish required access and work areas, as described in Chapter 2.0, Project Description.

#### **a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? *Less-than-Significant Impact***

Construction of the project will generate GHG emissions over the 12-month construction period. Construction-related emissions will result from off-road construction equipment and machinery, helicopter activity, and from vehicular traffic generated by commuting workers and material hauling and disposal. Following project completion, all construction emissions will cease. The project’s total estimated GHG emissions associated with construction activities are shown in Table 3.7-2: Estimated Construction-Related Greenhouse Gas Emissions.

Project construction emissions that are associated with the use of off-road construction equipment—such as graders, backhoes, loaders, and cranes—were estimated for the project using CalEEMod. Construction-related helicopter emissions were estimated using emissions factors obtained from the California Climate Action Registry and data from the Swiss FOCA. To estimate off-site construction-related vehicle emissions that will be associated with construction of the project, CalEEMod, which employs emission factors for on-road trucks and worker vehicles derived from CARB’s EMFAC2011 Model, was also used.

Table 3.7-2 presents the total estimated GHG construction emissions that will be generated by the project. As described in the table, approximately 1,748.7 metric tons of CO<sub>2e</sub>, reduced from approximately 1,840.7 metric tons per year by APM GHG-1, will be generated during the project’s construction phase.

**Table 3.7-2: Estimated Construction-Related Greenhouse Gas Emissions**

Construction Phase	CO <sub>2</sub> e metric tons (w/o APMs)	CO <sub>2</sub> e metric tons (w/ APMs)
Survey	5.7	5.4
Access Roads and Drainage Crossings	23.8	22.6
Wooden Pole Replacement	51.7	49.1
Circuit Breaker Installation	82.8	78.7
Tubular Steel Pole Installation	67.6	64.2
Material, Equipment, and Supplies Hauling	29.8	28.3
Conductor Installation	332.5	315.9
Restoration and Cleanup	21.0	20.0
Helicopter Operations	1,225.8	1,164.5
<b>Total</b>	<b>1,840.7</b>	<b>1,748.7</b>
Notes: Consistent with BAAQMD CEQA guidelines, reduction in GHG emissions assumes that implementation of APM GHG-1 will achieve 5 percent reduction in emissions as a result of minimizing idling and maintaining equipment in proper operating condition.		

The project will not require a change in PG&E’s existing O&M activities, with the exception of actions taken to address potential leakage of SF<sub>6</sub> from new circuit breakers, and will not result in a net change in long-term vehicle or equipment exhaust emissions. Estimated potential SF<sub>6</sub> emissions are shown in Table 3.7-3: O&M-Related Greenhouse Gas Emissions. These emissions assume a 1 percent leak rate (36.2 metric tons/year CO<sub>2</sub>e), reduced to 0.5 percent (18.1 metric tons/year CO<sub>2</sub>e) through implementation of APM GHG-2.

**Table 3.7-3: O&M-Related Greenhouse Gas Emissions**

O&M Phase	CO <sub>2</sub> e metric tons/year (w/o APMs)	CO <sub>2</sub> e metric tons/year (w/ APMs)
Circuit Breaker SF <sub>6</sub> Leakage	36.2	18.1
Notes: Per APM GHG-2, PG&E will require that the new breakers at Fitch Mountain Substation have a manufacturer’s guaranteed maximum leakage rate of 0.5 percent per year or less for SF <sub>6</sub> .		

As indicated in Table 3.7-2, total GHG construction emissions in the form of CO<sub>2</sub>e will be approximately 1,748.7 metric tons during the project’s construction phase. These emissions amortized over a 30-year period equal approximately 58.3 metric tons per year. Combining the amortized construction emissions with the estimated potential SF<sub>6</sub> O&M emissions, the total is 76.4 metric tons CO<sub>2</sub>e emitted per year, which will be substantially less than the significance threshold of 10,000 metric tons of CO<sub>2</sub>e per year. Therefore, the GHG emissions generated by



the project will not be cumulatively considerable and will not significantly contribute to global climate change. The impact will be less than significant.

**b) Would the project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases? *No Impact***

The project will not conflict with an applicable plan, policy, or regulation adopted to reduce GHG emissions. The minimal short-term, construction-related GHG emissions will not interfere with the long-term goal of AB 32 to reduce GHG emissions to 1990 levels by 2020. Additionally, APMs GHG-1 and GHG-2 incorporate measures that will further reduce less-than-significant impacts. Therefore, the project will not conflict with plans, policies, or regulations intended to reduce GHGs and there will be no impact.

**3.7.5 REFERENCES**

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