

4.7 GREENHOUSE GAS EMISSIONS

4.7.1 Environmental Setting

Greenhouse Gases and Climate Change

Greenhouse gases (GHGs) are of global concern because they cause global climate change. GHGs contribute to climate change by “absorb[ing] and re-emit[ting] most of the energy that radiates upward from the Earth’s surface, adding the heat back to the lower atmosphere and warming the Earth’s surface” (EPA 2012). Scientific research indicates that observed global climate change is very likely a result of increased GHG emissions associated with industrial-era human activities. The principal GHGs contributing to global climate change are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated compounds, such as hydrofluorocarbons, perfluorocarbons, and SF₆ (EIA 2014). Fossil fuel combustion is the main source of CO₂ emissions. Fossil-based fuel production, agriculture, and landfills emit CH₄. Agricultural activities, industrial activities, fossil fuel combustion, and solid waste combustion produce N₂O. Industrial processes and various household and commercial uses emit fluorinated compounds (EPA 2012). SF₆ is a fluorinated gas commonly used in the utility industry as an insulating gas in circuit breakers and other electronic equipment.

Global climate change results in several effects. Effects include increased temperatures; changes in snow and rainfall patterns; and an increase in droughts, tropical storms, and heavy rain events. These effects have positive and negative ramifications. Warmer temperatures may reduce demand for heating and may result in favorable conditions for certain crops. Conversely, increased temperatures can be disadvantageous for vulnerable populations and can damage certain crops. Precipitation can increase water supplies, but concentrated precipitation can cause death and infrastructure damage (EPA 2012).

Emissions Contributions and Trends

Table 4.7-1 presents CO₂ equivalent emissions quantities, trends, and sources for the United States, California, San Diego County, and the City of Chula Vista.

4.7.2 Regulatory Setting

Federal

Environmental Protection Agency

On April 2, 2007, the Supreme Court found in *Massachusetts v. EPA* that GHGs are air pollutants under the CAA. The EPA, therefore, has the authority to regulate GHG emissions. The Court also directed EPA to declare whether there is enough scientific uncertainty to preclude EPA from making a decision that GHGs contribute to global warming or whether there is enough information for EPA to find that GHGs endanger public health or welfare.

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Table 4.7-1 CO₂ Equivalent Emissions Contributions and Trends

Jurisdiction	CO ₂ Equivalent Emissions (metric tons)	Emissions Trends	Largest Emissions Source(s) (in descending order)
United States	6.7 billion (2011)	1990–2010: 8.4 percent increase 2010–2011: 1.6 percent decrease	Electricity generation, transportation, industry, agriculture, commercial, residential
California	448 million (2011)	2000–2003: 5.3 percent increase 2003–2011: 8.4 percent increase	Transportation, industry, electricity
San Diego County	5.78 million (2006)	1990–2006: 9.5 percent increase 2006–2020 (projected): 23.7 percent increase	On-road transportation
City of Chula Vista	969,000 (2010)	1990–2010: 33 percent increase	Transportation

Sources: CARB 2013, City of Chula Vista 2010, County of San Diego 2009, EPA 2012, and EPA 2013a

On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- **Endangerment Finding:** The current and projected concentrations of the six key well-mixed GHGs—CO₂, CH₄, N₂O, hydrofluorocarbons, perfluorocarbons, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

These findings were a prerequisite for implementing GHG emissions standards for vehicles. EPA and the National Highway Traffic Safety Administration have finalized standards for light-duty vehicles and heavy-duty vehicles and engines (EPA 2013b). The final standards for passenger vehicles and light-duty trucks are projected to result in an average level of 163 grams/mile of CO₂ emissions in model year 2025, equivalent to 54.5 miles per gallon (EPA 2013b). The heavy-duty vehicle standards apply to vehicle models 2014 and later and set separate limits for emissions of spark ignition and compression ignition engines (EPA 2013b).

State

Executive Order S-3-05

Executive Order S-3-05 was issued in 2005 and asserts that California is vulnerable to the impacts of climate change and that increased temperatures could reduce the Sierra snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emissions targets:

- Reduce GHG emissions to 1990 levels by 2020; and
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.

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Global Warming Solutions Act of 2006

In September 2006, the Governor of California signed AB 32 (Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006, which enacted California Health and Safety Code Sections 38500–38599. AB 32 requires reducing statewide GHG emissions to 1990 levels by 2020. CARB approved the Climate Change Scoping Plan to outline a framework of measures that would eventually be adopted and implemented to reach AB 32 goals. Regulations are being phased in over time. Adopted regulations include the 33 percent Renewable Portfolio Standard, the Cap-and-Trade Program, and the Low Carbon Fuel Standard. An update to the Scoping Plan was issued in May 2014. Relevant recommended actions of the updated Scoping Plan generally are related to transportation/goods movement and high-global warming potential gases. The actions are listed in Table 4.7-2.

Table 4.7-2 CARB Climate Change Scoping Plan Actions

Action	Expected Completion Date
Propose “Phase 2” heavy-duty truck GHG standards (CARB)	2016
Begin compliance actions for working toward the elimination of disposal of organic waste in landfills if the legislature does not act in 2014 (CalRecycle, CARB)	2016
Continue diesel controls that will reduce black carbon emissions by 95 percent from the late 1960s to 2020 (CARB)	2020
Reduce emissions of smog-forming pollutants by about 90 percent below 2010 levels by 2032 to meet the NAAQS for O ₃ (CARB)	2032

Source: CARB 2014

CARB also adopted an early action, as part of AB 32, to require reduction of SF₆ emissions from electricity transmission and distribution equipment. Regulations to reduce SF₆ emissions from gas-insulated switchgear include a maximum allowable SF₆ emission rate for gas-insulated switchgear that decreases annually to a final level of 1 percent in the year 2020 (17 CCR 95352). Gas insulated switchgear includes switches, stand-alone gas-insulated equipment, and any combination of electrical disconnects, fuses, electrical transmission lines, transformers and/or circuit breakers used to isolate gas insulated electrical equipment. Gas-insulated switchgear owners must also conduct an inventory of their equipment and SF₆ gas (17 CCR 95355). There are also annual reporting requirements for SF₆ emissions (17 CCR 95356).

Local

County of San Diego Climate Action Plan

The County drafted a Climate Action Plan to satisfy General Plan Policy COS-20.1. The Climate Action Plan outlines, among other items, several GHG emissions reduction measures. Relevant emissions reduction measures include increasing transit use, increasing walking and biking, and increasing ridesharing (County of San Diego 2012).

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City of Chula Vista CO₂ Reduction Plan

The City of Chula Vista CO₂ Reduction Plan outlines measures to lower the City’s CO₂ emissions. A limited number of measures are relevant to or could be affected by implementation of the proposed project, including designating bikeways and bike lanes, improving safety of pedestrian travel, and facilitating direct pedestrian connection with transit (City of Chula Vista 2000).

4.7.3 Applicant Proposed Measures

SDG&E proposes to implement measures that would reduce environmental impacts. The following relevant APM is considered part of the proposed project (Table 4.7-3). The significance of the impact, however, is first considered prior to application of the APM and a significance determination is made. The implementation of the APM is then considered as part of the project when determining whether impacts would be significant and thus would require mitigation. This APM would be incorporated as part of any CPUC approval of the project, and SDG&E would be required to adhere to the APM as well as any identified mitigation measures. The APM is included in the MMRP for the project (refer to Section 9: Mitigation Monitoring and Report Plan in this Draft EIR), and the implementation of the measure would be monitored and documented in the same manner as mitigation measures.

Table 4.7-3 Applicant Proposed Measures for Greenhouse Gas Emissions Impacts

APM Number	Requirements
APM GHG-1: SF₆ Management	<p>The proposed Salt Creek Substation would be an air-insulated substation. Equipment containing sulfur hexafluoride (SF₆) gas will only be used for transmission circuit breakers. SDG&E SF₆ mitigation strategies will be implemented during operation and maintenance of SF₆-containing equipment installed as part of the proposed project. These strategies are as follows:</p> <ul style="list-style-type: none"> • Recording company-wide SF₆ purchases, use, and emissions rates to comply with the EPA rule on Electrical Transmission and Distribution Equipment Use (Mandatory Reporting of Greenhouse Gases, 40 Code of Federal Regulations Part 98, Subpart DD) and CARB’s Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear (California Code of Regulations Title 17, Sections 95350–95359). • Continuing to participate in the EPA Sulfur Hexafluoride Partnership. • Implementing a recycling program. • Training employees on safe and proper handling of SF₆. • Continuing to report greenhouse gas emissions to The Climate Registry. • Implementing SDG&E’s SF₆ leak detection and repair program. This program includes monthly visual inspections of each gas circuit breaker (GCB), which includes checking pressure levels within the breaker and recording these readings in SDG&E’s Substation Management System. During installation or major overhaul of any GCB, the unit is tested over a 24-hour period to ensure that no leaks are present. Minor overhauls of each GCB are conducted every 36 to 40 months to check overall equipment health. This process includes checking gas pressure, moisture ingress, and SF₆ decomposition. If the GCB fails any of these checks, the unit is checked for leaks and repaired. In addition, all GCBs are equipped with a gas monitoring device and alarm that automatically alerts SDG&E’s Grid Operations Center. If gas pressure approaches minimum operating levels, an alarm is immediately reported to SDG&E’s Substation Construction and

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APM Number	Requirements
	<p>Maintenance Department. The GCB is usually inspected for leaks within 24 hours of such an alarm. SDG&E's leak detection practice includes the following three methodologies:</p> <ul style="list-style-type: none">– Spraying a leak-detection agent onto common leak points, including O rings, gaskets, and fittings;– Using a field-monitoring device (sniffer) to detect the presence of SF₆ gas; and– Using a Flir's leak-detection camera to detect the presence of SF₆ gas when the above two methods are unsuccessful in finding a leak.

4.7.4 Significance Criteria

Appendix G of CEQA Guidelines (14 CCR 15000 et seq.) provides guidance on assessing whether a project will have significant impacts on the environment. Consistent with Appendix G, the proposed project would have significant impacts on GHGs if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of greenhouse gases

4.7.5 Environmental Impacts and Mitigation Measures

This section presents the environmental impact analysis for GHG emissions associated with construction, operation, and maintenance of the proposed project and alternatives.

Approach

The impact assessment approach is to estimate the GHG emissions associated with the proposed project and compare them to applicable interim threshold standards.

Emission Calculations

Annual GHG emissions for construction of the proposed project were calculated using the same approach as criteria air pollutant emissions (see Air Quality Modeling in Section 4.3.5: Air Quality). The construction emissions were then amortized over 30 years. Since the proposed substation would be an unattended and automated air-insulated substation, annual operational GHG emissions were calculated for the primary source of GHG emissions (SF₆ emissions from the transmission circuit breakers).

GHG emissions associated with vehicle transport during operation and maintenance would be infrequent and as needed, and similar to existing conditions since there is ongoing maintenance for the existing transmission line within the ROW.

Emissions Thresholds

The SDAPCD does not currently have GHG emission significance thresholds for use in CEQA analyses. The California Governor's Office of Planning and Research's (OPR) Technical Advisory, *CEQA and Climate Change: Addressing Climate Change through CEQA Review*, states that (OPR 2008):

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In the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a “significant impact,” individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice.

The CPUC applies thresholds from CARB or from another air district when the local air district has not adopted a threshold of significance. CPUC has applied SCAQMD’s interim threshold because (CPUC 2012):

- CARB has not set a significance threshold
- SCAQMD’s threshold has undergone public review
- SCAQMD’s threshold is the only emissions threshold that takes construction emissions into account

The interim GHG emission thresholds and GHG emission calculations associated with the proposed project are expressed in metric tons (MT) of CO₂ equivalent (CO₂e) per year. Each GHG has an estimated global warming potential, which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the earth’s surface. CO₂e is a measure for comparing emissions from various GHGs to CO₂ (the predominant GHG), based on their global warming potential. SF₆ is the most potent GHG with 23,900 times the global warming potential as CO₂. An emission of one MT of SF₆ equates to an emission of 23,900 MT CO₂e.

SCAQMD has adopted an interim threshold of 10,000 MT CO₂e per year (total construction emissions amortized over 30 years added to operational GHG emissions) (SCAQMD 2008).

Impact Assessment

Table 4.7-4 provides a summary of the significance of potential impacts to greenhouse gases prior to application of APMs, after application of APMs and before implementation of mitigation measures, and after the implementation of mitigation measures.

Table 4.7-4 Summary of Potential Impacts to Greenhouse Gas Emissions

Significance Criteria	Project Phase	Significance Prior to APMs	Significance After APMs and Before Mitigation	Significance After Mitigation
Impact GHG-1: Potential to generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	Construction	Less than significant	Less than significant	Less than significant
	Operation and Maintenance	Less than significant	Less than significant	Less than significant

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Significance Criteria	Project Phase	Significance Prior to APMS	Significance After APMS and Before Mitigation	Significance After Mitigation
Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of greenhouse gases	Construction	Significant	Significant	Less than Significant MM GHG-1, MM Traffic-3
	Operation and Maintenance	Significant	Significant	Less than Significant MM GHG-1

Impact GHG-1: Potential to generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (*Less than significant; no mitigation required*)

Construction

Construction would result in GHG emissions during the following activities:

- Vegetation clearing
- Grading
- Excavating
- Pole and facility installation
- Vehicle traffic to and from site
- Equipment and material transport
- Helicopter use for conductor stringing

Estimated GHG emissions from construction of the proposed project would be up to 2,338 MT CO_{2e}, as shown in Table 4.7-5. The project's amortized emissions (i.e., emissions distributed over a period of 30 years) would be up to approximately 78 MT CO_{2e} annually (SDG&E 2015a). Impacts would be less than significant and no mitigation is required.

Table 4.7-5 Proposed Project GHG Emissions

Pollutant	Annual Emissions (metric tons)	Global Warming Potential	Annual CO ₂ Equivalent Emissions (metric tons)
Construction¹			
CO ₂	2,087	1	2,087
CH ₄	0.15	21	3
N ₂ O	0.80	310	248
<i>Subtotal</i>			2,338
Amortized (over 30 years)			78
Operation and Maintenance²			
SF ₆	0.0001	23,900	2.5
Proposed Project Total			80.5
Threshold			10,000
Exceeds Threshold?			No

Sources: ¹ SDG&E 2015a; and ² SDG&E 2013

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Operation and Maintenance

The proposed project's operation and maintenance GHG emissions would primarily result from equipment that contains SF₆, which is limited to the gas-insulated transmission circuit breakers. The proposed project's transmission circuit breakers are designed with a leak rate of approximately 0.1 percent annually and each 69-kV circuit breaker is estimated to hold 33 pounds of SF₆ (SDG&E 2013). The six transmission circuit breakers at the proposed substation would emit approximately 0.198 pounds of SF₆ per year, and the additional circuit breaker at Miguel Substation for TL 6965 would emit up to 0.033 pounds of SF₆ per year. The CO₂e emissions per year during operation and maintenance of the project are summarized in Table 4.7-5.

Vehicle travel would also emit GHGs (CO₂, CH₄, and NO_x). The substation would be remotely operated and would not result in regular vehicle travel and emissions of GHG. SDG&E currently conducts inspections of the existing transmission lines in the ROW. The inspection of TL 6965 would not increase the frequency or duration of power line inspections in the transmission corridor and would therefore not increase GHGs from inspection of the power lines. Vehicle emissions associated with transmission line operation and maintenance would be similar to existing conditions and would be far below emissions during construction. Impacts would be less than significant, and no mitigation is required.

Total annual CO₂e emissions from construction, operation, and maintenance activities would be approximately 80.5 MT CO₂e and well below the SCAQMD emissions threshold of 10,000 MT CO₂e per year. Impacts would be less than significant, and no mitigation is required.

Mitigation Measures: None required.

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

Construction

Project construction activities would result in emissions that are covered by the CARB Scoping Plan. Conformity with relevant Scoping Plan actions is summarized in Table 4.7-6.

Organic matter disposal at a landfill after 2016 would be in conflict with the CARB Scoping Plan action, which is considered a significant effect. Mitigation Measure GHG-1 would reduce the effect by requiring disposal of organic materials (e.g., vegetation cleared from the site) in a greenwaste recycling program or through land application. Impacts would be less than significant with mitigation.

The San Diego County Climate Action Plan and the Chula Vista CO₂ Reduction Plans include designating bikeways and bike lanes, improving safety of pedestrian travel, and facilitating direct pedestrian connection with transit (City of Chula Vista 2000). The project would temporarily block bike and pedestrian paths on Hunte Parkway during installation of the distribution circuits and potentially during delivery of materials to the substation site. The impact to bicycle and pedestrian facilities would be a significant impact. Mitigation Measure

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Table 4.7-6 Project Conformity with CARB Scoping Plan Actions

Action	Expected Completion Date	Project Conflict?
Propose "Phase 2" heavy-duty truck GHG standards (CARB)	2016	SDG&E has proposed to use only Tier 2 or Tier 3 equipment during construction. Tier 2 equipment is comparable to Phase 2 heavy-duty truck standards and Tier 3 would meet a more stringent rule. Both vehicles would comply with the rule if it were adopted. The project would not conflict with this Scoping Plan action.
Begin compliance actions for working toward the elimination of disposal of organic waste in landfills if the legislature does not act in 2014 (CalRecycle, CARB)	2016	The legislature did not act so compliance actions toward eliminating disposal of organic waste in landfills should begin by 2016. SDG&E proposes to dispose of organic materials, such as excess soil, vegetation, and wood (e.g., from shipping materials) at a landfill. Vegetation removal, grading, and soil removal at the substation would occur after 2016, when this requirement is effective. Disposal of vegetation in a landfill would conflict with this Scoping Plan action.
Continue diesel controls that will reduce black carbon emissions by 95 percent from the late 1960s to 2020 (CARB)	2020	The project would use diesel-burning vehicles and equipment, which produce black carbon emissions. Diesel regulations have been used to reduce black carbon emissions. The Scoping Plan notes that regulations for diesel particulate retrofits and for turnover of legacy fleets are a key to continued reductions. It is unclear when or if these regulations will be implemented; however, SDG&E has committed to reducing exhaust emissions by implementing APM AIR-2. The project would not conflict with this Scoping Plan action.
Reduce emissions of smog-forming pollutants by about 90 percent below 2010 levels by 2032 to meet the NAAQS for O ₃ (CARB)	2032	The project would use diesel-burning vehicles and equipment, which produce emissions that would contribute to smog formation. The project is consistent with the Eight-hour Ozone Attainment Plan, which was drafted to outline how the O ₃ NAAQS will be met. The project would not conflict with this Scoping Plan action.

Traffic-3 requires detours for bicyclists and pedestrians to reduce impacts to bike lanes and safe pedestrian travel. Impacts would be less than significant with mitigation.

Operation and Maintenance

Project operation and maintenance would result in SF₆ emissions through use of gas-insulated switchgear at the substations. Gas-insulated switchgear leaks SF₆ during normal operation. California has regulations, as previously described, for gas-insulated switchgear. SDG&E would comply with the regulations and the effect would be less than significant. SDG&E would implement APM GHG-1 for SF₆ management, as described in Table 4.7-3. APM GHG-1 requires SDG&E to detect and repair leaks of SF₆ and comply with state requirements for SF₆ emissions from gas-insulated switchgear. Impacts would be less than significant, and no mitigation is required.

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Project operation and maintenance would not conflict with AB 32 goals because SDG&E has committed to using operation and maintenance vehicles and equipment that comply with requirements in CARB’s Scoping Plan. Mitigation Measure GHG-1 would ensure the project is consistent with the Scoping Plan. Impacts would be less than significant with mitigation.

Project operation and maintenance would not conflict with the San Diego County Climate Action Plan or the City of Chula Vista CO₂ Reduction Plan because operation and maintenance would not affect access to pedestrian routes, transit routes, or bike routes. Maintenance activities would be conducted primarily within the substation pad and transmission corridor would not conflict with pedestrian or bicycle access and travel. The project would therefore not conflict with the Plans. Impacts would be less than significant, and no mitigation is required.

Mitigation Measures: GHG-1 and Traffic-3

Mitigation Measure GHG-1: SDG&E shall dispose of organic matter removed after 2016 by means other than transporting to a landfill. Options for non-landfill disposal may include composting on previously disturbed SDG&E land or participating in a greenwaste recycling program. SDG&E shall notify the CPUC of the disposal method at least 30 days prior to construction.

Significance after Mitigation: Less than Significant.

4.7.6 Project Alternatives

Table 4.7-7 provides a summary of the greenhouse gas impacts resulting from each project alternative.

Table 4.7-7 Summary of Impacts from Alternatives by Significance Criteria

Significance Criteria	No Project Alternative	Alternative 1	Alternative 2	Alternative 3
Impact GHG-1: Potential to generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	Less than significant	Less than significant	Less than significant	Less than significant
Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of greenhouse gases	No impact	Less than significant with mitigation APM GHG-1 MM GHG-1, MM Traffic-3	Less than significant with mitigation APM GHG-1 MM GHG-1, MM Traffic-3	Less than significant with mitigation APM GHG-1 MM GHG-1, MM Traffic-3

Alternative 1: 230/12-kV Substation and 230-kV Loop-In

Environmental Setting

Alternative 1 would involve construction of a 230/12-kV substation within the SDG&E fee-owned parcel south of Hunte Parkway and would not include construction of TL 6965. The

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existing GHG conditions for the proposed project described in Section 4.7.1 would apply to this alternative.

Impacts and Mitigation Measures

The 230/12-kV substation would be larger than the proposed substation and would require a construction timeframe approximately 6 months longer than the proposed substation (24 to 30 months compared to 18 to 24 months for the proposed project). Additional truck trips would be required due to the increased size of the site. Larger cranes would be needed to install the taller A-frames and a bigger hauler would be needed to transport the 230/12-kV transformers. Estimated annual GHG emissions from construction and operation of Alternative 1 (amortized) are provided in Table 4.7-8.

GHG emissions from construction of Alternative 1 would be greater than emissions from the proposed project. Estimated annual emissions would be up to 2,794 MT CO_{2e}; amortized emissions would be up to approximately 93 MT CO_{2e} annually (SDG&E 2015a).

GHG emissions from operation of the 230/12-kV substation would be greater than the proposed substation. Similar to the proposed project, equipment containing SF₆ gas would only be used for transmission circuit breakers and the leak rate would be approximately 0.5 percent annually. The 230-kV circuit breakers hold more SF₆ than the proposed project's 69-kV circuit breakers and would therefore result in greater emissions. GHG emissions at the 230/12-kV substation would be 52 MT CO_{2e}, which is approximately 49.5 MT CO_{2e} more than the proposed project. Maintenance of the Alternative 1 substation would require slightly more vehicles and equipment activity than the proposed project due to the larger quantity of oil in the transformers and SF₆ in the circuit breakers. Total annual CO_{2e} emissions from construction and

Table 4.7-8 Alternative 1 GHG Emissions

Pollutant	Annual Emissions (metric tons)	Global Warming Potential	Annual CO ₂ Equivalent Emissions (metric tons)
Construction¹			
CO ₂	2,509	1	2,509
CH ₄	0.16	21	3
N ₂ O	0.91	310	282
<i>Subtotal</i>			2,794
Total Amortized (over 30 years)			93
Operation and Maintenance²			
SF ₆	0.0022	23,900	52
Alternative 1 Total			145
Threshold			10,000
Exceeds Threshold?			No

Sources: ¹SDG&E 2015a; ²SDG&E 2014

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from operation and maintenance activities would be approximately 145 MT CO₂e and well below the SCAQMD emissions threshold of 10,000 MT CO₂e per year. Impacts from GHG emissions would therefore be less than significant and no mitigation is required.

Alternative 1 would have the same potential to conflict with GHG plans and policies as the proposed project. SDG&E would implement APM GHG-1, which conforms to the CARB Rule for gas-insulated switchgear. However, APM GHG-1 does not address other applicable plan goals and policies including organic matter disposal and bicycle and pedestrian safety and access impacts. Mitigation Measures GHG-1 and Traffic-3 would avoid the potential for significant effects from conflicts with plans and policies. Mitigation Measure GHG-1 requires SDG&E to dispose of all organic matter by other means than transport to a landfill after 2016. Mitigation Measure Traffic-3 requires implementation of a Traffic Management Plan, which specifies measures that will be taken if construction activities have the potential to affect trails, a transit stop, or bike routes. Effects of Alternative 1 would be less than significant with mitigation.

Alternative 1 would not involve installation of a 5-mile-long 69-kV power line and would avoid GHG emissions from construction and maintenance of the power line.

Alternative 2: 69/12-kV Substation and Generation at Border and Larkspur Electric Generating Facilities

Environmental Setting

This alternative would involve construction of the substation, distribution lines, and TL 6910 loop-in in the same manner as the proposed project. The existing GHG conditions described in Section 4.7.1 would apply to this alternative.

Impacts and Mitigation Measures

GHG emissions from construction of Alternative 2 would be the same as GHG emissions for construction of the proposed project substation, distribution lines, and TL 6910 loop-in. Estimated annual GHG emissions (amortized) from construction of Alternative 2 would be 62 MT CO₂e, which is approximately 16 MT CO₂e less than the amortized GHG emissions from construction of the proposed project because Alternative 2 does not involve construction of a new 69-kV power line. GHG emissions from construction and operation of Alternative 2 are shown in Table 4.7-9.

Estimated annual GHG emissions from operation and maintenance of Alternative 2 would be approximately 213.5 MT CO₂e, as shown in Table 4.7-9. Similar to the proposed project, Alternative 2 would have SF₆ emissions from the substation switchgear. Operation of Alternative 2 would also involve GHG emissions associated with the generation of electric energy during periods of peak demand. Energy would be generated from natural gas-fired turbines at the Border and Larkspur electric generating facilities. SDG&E currently uses power generated at Border and Larkspur electric facilities. Based on anticipated energy demand, the use of these facilities would increase by 2 to 3 percent annually if a new power line were not constructed between the proposed substation and Miguel Substation. GHG emissions would be approximately 211 MT CO₂e annually by 2027 (SDG&E 2015b). Annual GHG emissions could

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Table 4.7-9 Alternative 2 Project GHG Emissions

Pollutant	Annual Emissions (metric tons)	Global Warming Potential	Annual CO ₂ Equivalent Emissions (metric tons)
Construction¹			
CO ₂	1,653	1	1,653
CH ₄	0.12	21	3
N ₂ O	0.63	310	195
<i>Subtotal</i>			1,851
Total Amortized (over 30 years)			62
Operation and Maintenance			
SF ₆ ²	0.0001	23,900	2.5
GHG emissions from new generation ³	211	1	211
<i>Subtotal</i>			213.5
Alternative 2 Total			275.5
Threshold			10,000
Exceeds Threshold?			No

Sources: ¹SDG&E 2015a; ²SDG&E 2013; and ³SDG&E 2015b

not be estimated beyond 2027 because future energy demand after 2027 would be speculative, as described in Section 3: Alternatives. Impacts from GHG emissions would be less than significant and no mitigation is required.

Alternative 2 would have the same potential to conflict with GHG plans and policies as the proposed project. SDG&E would implement APM GHG-1, which conforms to the CARB Rule for gas-insulated switchgear. Mitigation Measures GHG-1 and Traffic-3 would avoid the potential for significant effects. Effects of Alternative 2 would be less than significant with mitigation.

Alternative 2 would not involve installation of a 5-mile-long 69-kV power line and would avoid GHG emissions from construction and maintenance of the power line.

Alternative 3: 69/12-kV Substation and Underground 69-kV Power Line within Public ROW

Environmental Setting

The environmental setting for this alternative is described in Section 4.7.1. This alternative would involve construction of a substation, distribution lines, and TL 6910 loop-in the same location as the proposed project. This alternative does not include the transmission corridor but would instead include construction of an underground power line. The underground power line would be constructed within Hunte Parkway, Proctor Valley Road, and Mountain Miguel Road, located within the City of Chula Vista. The proposed 69-kV line would be overhead

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within Miguel Substation in the same configuration as the proposed project. The GHG emission conditions described in Section 4.7.1 would apply to this alternative.

Impacts and Mitigation Measures

Total GHG emissions from construction of Alternative 3 would be up to 3,029 MT CO_{2e} annually (101 MT CO_{2e} amortized), which is approximately 691 MT CO_{2e} greater than emissions from construction of the proposed project. Alternative 3 would require the use of additional diesel-powered equipment to construct the underground power line. Additional equipment use account for the increase in GHG emissions compared to the proposed project. Total estimated GHG emissions from Alternative 3 are shown in Table 4.7-10.

Alternative 3 GHG emissions during operation and maintenance would be similar to the proposed project because the alternative would involve the same number and size of SF₆-containing switchgear and would have a similar frequency for inspections and routine maintenance. Maintenance of the underground power line could result in greater GHG emissions than the proposed project because excavation would be required to access and conduct repairs to the buried line, whereas the proposed TL 6965 would be overhead and easily accessible for maintenance. Total annual CO_{2e} emissions from construction, operation and maintenance activities would be approximately 103.5 MT CO_{2e} and well below the SCAQMD emissions threshold of 10,000 MT CO_{2e} per year; therefore, impacts would be less than significant.

Similar to the proposed project, Alternative 3 could conflict with GHG plans and policies. Alternative 3 would have a greater potential to conflict with the policies related to access to bicycle and pedestrian safety and access to public transit because Alternative 3 would involve open excavation within roadways for up to 13 months. The open excavation could impact

Table 4.7-10 Alternative 3 GHG Emissions

Pollutant	Annual Emissions (metric tons)	Global Warming Potential	Annual CO ₂ Equivalent Emissions (metric tons)
Construction¹			
CO ₂	2,741	1	2,741
CH ₄	0.16	21	3
N ₂ O	0.92	310	285
<i>Subtotal</i>			3,029
Total Amortized (over 30 years)			101
Operation and Maintenance²			
SF ₆	0.0001	23,900	2.5
Alternative 3 Total			103.5
Threshold			10,000
Exceeds Threshold?			No

Sources: ¹SDG&E 2015a; and ²SDG&E 2014

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bicycle paths as well as bus stops. These conflicts would be a significant impact. SDG&E would implement APM GHG-1, which conforms to the CARB Rule for gas-insulated switchgear. Impacts would be significant even after implementation of APM GHG-1. Mitigation Measures GHG-1 requires that organic waste either be taken to a facility with greenwaste or applied to the site. Mitigation Measure Traffic-3 and Traffic 3-Alt 3-2 would reduce potential conflicts by requiring detours for pedestrian and bicycle traffic and requiring notification of the school district and SDMTA regarding potential bus stop closures and reroutes. Impacts would be less than significant with mitigation.

No Project Alternative

Under the No Project Alternative, SDG&E would meet energy needs of the southeast Chula Vista area by adding two additional transformer banks at the Proctor Valley Substation and installing 6 to 7 miles of distribution circuits to the Otay Ranch Area. GHG emissions from construction of the distribution circuits would result in fewer emissions than the proposed project. The No Project Alternative would avoid all GHG emissions from construction, operation and maintenance of the proposed project. Impacts would be less than significant.

GHG emissions would result from construction and operation of the two additional transformers at Proctor Valley Substation. The additional transformer circuit breakers would contain and emit SF₆. These transformers have been approved and would be constructed even if the proposed project is constructed. Therefore, there would be no increase in GHG emissions from the build-out of the Proctor Valley Substation because this build-out would occur with or without the proposed project.

The potential to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of greenhouse gases would be less than the proposed project because no new facilities would be constructed that could conflict with plans or policies. There would be no impact.

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