Appendix 4. EMF Discussion

Electric and Magnetic Fields (EMF) Discussion

The California Public Utilities Commission (CPUC) and the California Department of Health Services (CDHS) have not concluded that exposure to magnetic fields from utility electric facilities is a health hazard. Many reports have concluded that the potential for health effects associated with electric and magnetic field (EMF) exposure is too speculative to allow the evaluation of impacts or the preparation of mitigation measures.

EMF is a term used to describe electric and magnetic fields that are created by electric voltage (electric field) and electric current (magnetic field). Power frequency EMF is a natural consequence of electrical circuits, and it can be either directly measured using the appropriate measuring instruments or calculated using appropriate information.

Electric Fields

Electric fields are present whenever voltage exists on a wire, and are not dependent on current. The magnitude of the electric field is primarily a function of the configuration and operating voltage of the line and decreases with the distance from the source (line). The electric field can be shielded (i.e., the strength can be reduced) by any conducting surface, such as trees, fences, walls, buildings, and most types of structures. The strength of an electric field is measured in volts per meter (V/m) or kilovolts per meter (kV/m).

Magnetic Fields

Magnetic fields are present whenever current flows in a conductor, and are not dependent on the voltage present on the conductor. The strength of these fields also decreases with distance from the source. However, unlike electric fields, most common materials have little shielding effect on magnetic fields.

The magnetic field strength is a function of both the current on the conductor and the design of the system. Magnetic fields are measured in units called Gauss. However, for the low levels normally encountered near power systems, the field strength is expressed in a much smaller unit, the milligauss (mG), which is one thousandth of a Gauss.

Power frequency EMF is present where electricity is used. This includes not only utility transmission lines, distribution lines, and substations, but also the building wiring in homes, offices, and schools, and in the appliances and machinery used in these locations. Typical magnetic fields from these sources can range from below 1 mG to above 1,000 mG (1 Gauss).

Magnetic field strengths diminish with distance. Fields from compact sources (i.e., those containing coils such as small appliances and transformers) decrease in inverse proportion to the distance from the source cubed. For three-phase power lines with balanced currents, the magnetic field strength drops off inversely proportional to the distance from the line squared. Fields from unbalanced currents, which flow in paths such as neutral or ground conductors, fall off inversely proportional to the distance from the source. Conductor spacing and configuration also affect the rate at which the magnetic field strength decreases.

The magnetic field levels of PG&E's overhead and underground transmission lines will vary depending upon customer power usage. Magnetic field strengths for typical PG&E transmission line loadings at the edge of rights-of-way are approximately 10 to 90 mG. Under peak load conditions, the magnetic fields at the edge of the right-of-way would not likely exceed 150 mG. There are no long-term, health-based state or federal government EMF exposure standards. State regulations for magnetic fields have been

developed in New York and Florida (150 mG and 200 mG at the edge of the right-of-way). However, these are based on limiting exposure from new facilities to levels no greater than existing facilities.

The strongest magnetic fields around the outside of a substation come from the power lines entering and leaving the station. The strength of the magnetic fields from transformers and other equipment decreases quickly with distance. Beyond the substation fence, the magnetic fields produced by the equipment within the station are typically indistinguishable from background levels.

Possible Health Effects

The possible effects of EMF on human health have come under scientific scrutiny. Concern about EMF originally focused on electric fields; however, much of the recent research has focused on magnetic fields. Uncertainty exists as to what characteristics of magnetic field exposure need to be considered to assess human exposure effects. Among the characteristics considered are field intensity, transients, harmonics, and changes in intensity over time. These characteristics may vary from power lines to appliances to home wiring, and this may create different types of exposures. The exposure most often considered is intensity or magnitude of the field.

There is a consensus among the medical and scientific communities that there is insufficient evidence to conclude that EMF causes adverse health effects. Neither the medical nor scientific communities have been able to provide any foundation upon which regulatory bodies could establish a standard or level of exposure that is known to be either safe or harmful. Laboratory experiments have shown that magnetic fields can cause biologic changes in living cells, but scientists are not sure whether any risk to human health can be associated with them. Some studies have suggested an association between surrogate measures of magnetic fields and certain cancers while others have not.

California Public Utilities Commission Decision Summary

Background

On January 15, 1991, the CPUC initiated an investigation to consider its role in mitigating the health effects, if any, of electric and magnetic fields from utility facilities and power lines. A working group of interested parties, called the California EMF Consensus Group, was created by the CPUC to advise it on this issue. It consisted of 17 stakeholders representing citizens groups, consumer groups, environmental groups, state agencies, unions, and utilities. The Consensus Group's fact-finding process was open to the public, and its report incorporated concerns expressed by the public. Its recommendations were filed with the Commission in March 1992.

In August 2004 the CPUC began a proceeding known as a “rulemaking” (R.04-08-020) to explore whether changes should be made to existing CPUC policies and rules concerning EMF from electric transmission lines and other utility facilities.

Through a series of hearings and conferences, the Commission evaluated the results of its existing EMF mitigation policies and addressed possible improvements in implementation of these policies. The CPUC also explored whether new policies are warranted in light of recent scientific findings on the possible health effects of EMF exposure.

The CPUC completed the EMF rulemaking in January 2006 and presented these conclusions in Decision D.06-01-042:

- The CPUC affirmed its existing policy of requiring no-cost and low-cost mitigation measures to reduce EMF levels from new utility transmission lines and substation projects.
- The CPUC adopted rules and policies to improve utility design guidelines for reducing EMF, and provides for a utility workshop to implement these policies and standardize design guidelines.

- Despite numerous studies, including one ordered by the Commission and conducted by the California Department of Health Services, the CPUC stated "we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences."
- The CPUC said it will "remain vigilant" regarding new scientific studies on EMF, and if these studies indicate negative EMF health impacts, the Commission will reconsider its EMF policies and open a new rulemaking if necessary.

In response to a situation of scientific uncertainty and public concern, the decision specifically requires PG&E to consider "no-cost" and "low-cost" measures, where feasible, to reduce exposure from new or upgraded utility facilities. It directs that no-cost mitigation measures be undertaken, and that low-cost options, when they meet certain guidelines for field reduction and cost, be adopted through the project certification process. PG&E was directed to develop, submit and follow EMF guidelines to implement the CPUC decision. Four percent of total project budgeted cost is the benchmark in implementing EMF mitigation, and mitigation measures should achieve incremental magnetic field reductions of at least 15%.

Reviews of EMF Studies

Hundreds of EMF studies have been conducted over the last 30 years in the areas of epidemiology, animal research, cellular studies, and exposure assessment. A number of nationally recognized multi-discipline panels have performed comprehensive reviews of the body of scientific knowledge on EMF. These panels' ability to bring experts from a variety of disciplines together to review the research gives their reports recognized credibility. It is standard practice in risk assessment and policymaking to rely on the findings and consensus opinions of these distinguished panels. None of these groups have concluded that EMF causes adverse health effects or that the development of standards were appropriate or would have a scientific basis.

Reports by the National Research Council/National Academy of Sciences, American Medical Association, American Cancer Society, National Institute of Environmental Health Sciences, World Health Organization, International Agency for Research on Cancer, and California Department of Health Services conclude that insufficient scientific evidence exists to warrant the adoption of specific health-based EMF mitigation measures. The potential for adverse health effects associated with EMF exposure is too speculative to allow the evaluation of impacts or the preparation of mitigation measures.

National Institute of Environmental Health Sciences

In June of 1999, the federal government completed a $60-million EMF research program managed by the National Institute of Environmental Health Sciences (NIEHS) and the Department of Energy (DOE). Known as the EMF RAPID (Research And Public Information Dissemination) Program. In their report to the U.S. Congress, the NIEHS concluded that:

> *The NIEHS believes that the probability that ELF-EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal, scientific support that exposure to this agent is causing any degree of harm.*

The NIEHS report also included the following conclusions:

> *The National Toxicology Program routinely examines environmental exposures to determine the degree to which they constitute a human cancer risk and produces the 'Report on Carcinogens' listing agents that are 'known human carcinogens' or 'reasonably anticipated to be human carcinogens.' It is our opinion that based on evidence to date,*

> *ELF-EMF exposure would not be listed in the 'Report on Carcinogens' as an agent 'reasonably anticipated to be a human carcinogen.' This is based on the limited epidemiological evidence and the findings from the EMF-RAPID Program that did not indicate an effect of ELF-EMF exposure in experimental animals or a mechanistic basis for carcinogenicity.*
>
> *The NIEHS agrees that the associations reported for childhood leukemia and adult chronic lymphocytic leukemia cannot be dismissed easily as random or negative findings. The lack of positive findings in animals or in mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but cannot completely discount the finding. The NIEHS also agrees with the conclusion that no other cancers or non-cancer health outcomes provide sufficient evidence of a risk to warrant concern.*
>
> *Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but it cannot completely discount the epidemiological findings.*
>
> *The NIEHS suggests that the level and strength of evidence supporting ELF-EMF exposure as a human health hazard are insufficient to warrant aggressive regulatory actions; thus, we do not recommend actions such as stringent standards on electric appliances and a national program to bury all transmission and distribution lines. Instead, the evidence suggests passive measures such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. NIEHS suggests that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards. We also encourage technologies that lower exposures from neighborhood distribution lines provided that they do not increase other risks, such as those from accidental electrocution or fire.*

U.S. National Research Council/National Academy of Sciences

In May 1999, the National Research Council/ National Academy of Sciences, an independent scientific agency responsible for advising the federal government on science, technology, and medicine, released its evaluation of the scientific and technical content of research projects conducted under the U.S. EMF RAPID Program, concluding that:

> *The results of the EMF-RAPID program do not support the contention that the use of electricity poses a major unrecognized public-health danger. Basic research on the effects of power-frequency magnetic fields on cells and animals should continue, but a special research-funding effort is not required. Investigators should compete for funding through traditional research-funding mechanisms. If future research on this subject is funded through such mechanisms, it should be limited to tests of well-defined mechanistic hypotheses or replications of reported positive effects. If carefully performed, such experiments will have value even if their results are negative. Special efforts should be made to communicate the conclusions of this effort to the general public effectively.*

The following specific recommendations are made by the committee:

1. The committee recommends that no further special research program focused on possible health

effects of power-frequency magnetic fields be funded. Basic research on the effects of power-frequency magnetic fields on cells and animals should continue but investigators should compete for funding through traditional research funding mechanisms.

2. If, however, Congress determines that another time-limited, focused research program on the health effects of power-frequency magnetic fields is warranted, the committee recommends that emphasis be placed on replications of studies that have yielded scientifically promising claims of effects and that have been reported in peer-reviewed journals. Such a program would benefit from the use of a contract-funding mechanism with a requirement for complete reports and/or peer-reviewed publications at program's end.
3. The engineering studies were initiated without the guidance of a clearly established biologic effect. The committee recommends that no further engineering studies be funded unless a biologic effect that can be used to plan the engineering studies has been determined.
4. Much of the information from the EMF-RAPID biology program has not been published in peer-reviewed journals. NIEHS should collect all future peer-reviewed information resulting from the EMF-RAPID biology projects and publish a summary report of such information periodically on the NIEHS Web site.
5. The communication effort initiated by EMF-RAPID is reasonable. The two booklets and the telephone information line are useful, as is the EMF-RAPID Internet site. There are two limitations to the effort. First, it is largely passive, responding to inquiries and providing information, rather than being active. Second, much of the information produced is in a scientific format not readily understandable by the public. The committee recommends that further material produced to disseminate information on power-frequency magnetic fields be written for the general public in a clear fashion. The Web site should be made more user-friendly. The booklet *Questions and Answers about EMF* should be updated periodically and made available to the public.

World Health Organization

The World Health Organization (WHO) established the International EMF Project in 1996 to investigate potential health risks associated with exposure to electric and magnetic fields (EMF). A WHO Task Group recently concluded a review of the health implications of extremely low frequency (ELF) EMF.

A Task Group of scientific experts was convened in 2005 to assess any risks to health that might exist from exposure to ELF electric and magnetic fields. Previously in 2002, the International Agency for Research on Cancer (IARC) examined the evidence regarding cancer; this Task Group reviewed evidence for a number of health effects, and updated the evidence regarding cancer. The conclusions and recommendations of the Task Group are presented in a WHO report titled: “Extremely Low Frequency Fields Environmental Health Criteria Monograph No.238” and Factsheet No 322.

> *“New human, animal and in vitro studies, published since the 2002 IARC monograph, do not change the overall classification of ELF magnetic fields as a possible human carcinogen.”*
>
> *“A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in both children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukaemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease.”*

"the epidemiological evidence is weakened by methodological problems, such as potential selection bias. In addition, there are no accepted biophysical mechanisms that would suggest that low-level exposures are involved in cancer development. Thus, if there were any effects from exposures to these low-level fields, it would have to be through a biological mechanism that is as yet unknown. Additionally, animal studies have been largely negative. Thus, on balance, the evidence related to childhood leukaemia is not strong enough to be considered causal."

"Policy-makers should establish an ELF EMF protection programme that includes measurements of fields from all sources to ensure that the exposure limits are not exceeded either for the general public or workers."

"Government and industry should monitor science and promote research programmes to further reduce the uncertainty of the scientific evidence on the health effects of ELF field exposure."

"Policy-makers, community planners and manufacturers should implement very low-cost measures when constructing new facilities and designing new equipment including appliances."

"Changes to engineering practice to reduce ELF exposure from equipment or devices should be considered, provided that they yield other additional benefits, such as greater safety, or little or no cost."

"When changes to existing ELF sources are contemplated, ELF field reduction should be considered alongside safety, reliability and economic aspects."

International Agency for Research on Cancer

In June of 2001, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization (WHO), evaluated the carcinogenic risk to humans of static and extremely low-frequency EMF. In October of 2001, the WHO published a Fact Sheet that summarized the IARC findings. Below is an excerpt from the fact sheet:

In June 2001, an expert scientific working group of IARC reviewed studies related to the carcinogenicity of static and ELF electric and magnetic fields. Using the standard IARC classification that weighs human, animal and laboratory evidence, ELF magnetic fields were classified as possibly carcinogenic to humans based on epidemiological studies of childhood leukaemia. Evidence for all other cancers in children and adults, as well as other types of exposures (i.e. static fields and ELF electric fields) was considered not classifiable either due to insufficient or inconsistent scientific information.

"Possibly carcinogenic to humans" is a classification used to denote an agent for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals.

This classification is the weakest of three categories ("is carcinogenic to humans", "probably carcinogenic to humans" and "possibly carcinogenic to humans") used by IARC to classify potential carcinogens based on published scientific evidence. Some examples of well-known agents that have been classified by IARC are listed below:

Classification	*Examples of Agents*
Carcinogenic to humans (usually based on strong evidence of carcinogenicity in humans)	*Asbestos* *Mustard gas* *Tobacco (smoked and smokeless)* *Gamma radiation*
Probably carcinogenic to humans (usually based on strong evidence of carcinogenicity in animals)	*Diesel engine exhaust* *Sun lamps* *UV radiation* *Formaldehyde*
Possibly carcinogenic to humans (usually based on evidence in humans which is considered credible, but for which other explanations could not be ruled out)	*Coffee* *Styrene* *Gasoline engine exhaust* *Pickled Vegetables* *ELF magnetic fields*

DO ELF FIELDS CAUSE CANCER?

ELF fields are known to interact with tissues by inducing electric fields and currents in them. This is the only established mechanism of action of these fields. However, the electric currents induced by ELF fields commonly found in our environment are normally much lower than the strongest electric currents naturally occurring in the body such as those that control the beating of the heart.

Since 1979 when epidemiological studies first raised a concern about exposures to power line frequency magnetic fields and childhood cancer, a large number of studies have been conducted to determine if measured ELF exposure can influence cancer development, especially leukaemia in children.

There is no consistent evidence that exposure to ELF fields experienced in our living environment causes direct damage to biological molecules, including DNA. Since it seems unlikely that ELF fields could initiate cancer, a large number of investigations have been conducted to determine if ELF exposure can influence cancer promotion or co-promotion. Results from animal studies conducted so far suggest that ELF fields do not initiate or promote cancer.

However, two recent pooled analyses of epidemiological studies provide insight into the epidemiological evidence that played a pivotal role in the IARC evaluation. These studies suggest that, in a population exposed to average magnetic fields in excess of 0.3 to 0.4 µT, twice as many children might develop leukaemia compared to a population with lower exposures. In spite of the large number data base, some uncertainty remains as to whether magnetic field exposure or some other factor(s) might have accounted for the increased leukaemia incidence.

Childhood leukaemia is a rare disease with 4 out of 100,000 children between the age of 0 to 14 diagnosed every year. Also average magnetic field exposures above 0.3 or 0.4 µT in residences are rare. It can be estimated from the epidemiological study results that less than 1% of populations using 240 volt power supplies are exposed to these levels, although this may be higher in countries using 120 volt supplies.

The IARC review addresses the issue of whether it is feasible that ELF-EMF pose a cancer risk. The next step in the process is to estimate the likelihood of cancers in the general population from the usual exposures and to evaluate evidence for other (non-cancer) diseases. This part of the risk assessment should be finished by WHO in the next 18 months.

American Cancer Society

In the journal, *A Cancer Journal for Clinicians*, the American Cancer Society (ACS) reviewed EMF residential and occupational epidemiologic research in an article written by Dr. Clark W. Heath, Jr., ACS's vice president of epidemiology and surveillance research. Dr. Heath reviews 13 residential epidemiologic studies of adult and childhood cancer. Dr. Heath wrote:

> *Evidence suggesting that exposure to EMF may or may not promote human carcinogenesis is mostly based on...epidemiologic observations.... While those observations may suggest such a relationship for leukemia and brain cancer in particular, the findings are weak, inconsistent, and inconclusive.... The weakness and inconsistent nature of epidemiologic data, combined with the continued dearth of coherent and reproducible findings from experimental laboratory research, leave one uncertain and rather doubtful that any real biologic link exists between EMF exposure and carcinogenicity.*

American Medical Association

The AMA adopted recommendations of its Council on Scientific Affairs (CSA) regarding EMF health effects. The report was prepared as a result of a resolution passed by AMA's membership at its 1993 annual meeting. The following recommendations are based on the CSA's review of EMF epidemiologic and laboratory studies to date, as well as on several major literature reviews:

- Although no scientifically documented health risk has been associated with the usually occurring levels of electromagnetic fields, the AMA should continue to monitor developments and issues related to the subject.
- The AMA should encourage research efforts sponsored by agencies such as the National Institutes of Health, the U.S. Department of Energy, and the National Science Foundation. Continuing research should include study of exposures to EMF and its effects, average public exposures, occupational exposures, and the effects of field surges and harmonics.
- The AMA should support the meeting of an authoritative, multidisciplinary committee under the auspices of the National Academy of Sciences or the National Council on Radiation Protection and Measurements to make recommendations about exposure levels of the public and workers to EMF and radiation.

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Table A5.3-1. Project Emissions Summary

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Average Daily Emissions (lbs/day)[a]						Annual Emissions (metric tons/year)[c]
	ROG	CO	NOx	SOx	PM_{10}[b]	$PM_{2.5}$[b]	CO_2e
Project Emissions							
Construction Year 2026	15.4	119	48.5	2.89	7.0	22.1	436
Construction Year 2027	16.4	106	96	9.0	10.1	18.4	2,471
Construction Year 2028	5.02	25.5	22.2	2.53	2.3	1.3	608
Construction Year 2029	0.00	0.04	0.07	0.00	0.03	0.01	4.45
Construction Year 2030	0.00	0.03	0.04	0.00	0.02	0.01	0.72
Maximum Average Daily Emissions (lbs/day)	**16.4**	**119**	**96**	**9.0**	**10.1**	**22.1**	**NA**
BAAQMD Significance Threshold (lbs/day)	**54**	**NA**	**54**	**NA**	**82**	**54**	**NA**
30-Year Amortized Emissions (metric tons/year)[d]	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**131**
SCAQMD Significance Threshold (metric tons/year)	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**10,000**
Exceeds Threshold (Y/N)?	**N**	**N**	**Y**	**N**	**N**	**N**	**N**
Phase	**Emissions (lbs/phase)[e]**						**Emissions (metric tons/ phase)[e]**
Phase/Activity #1 - Rebuild Lines Overhead and Remove Existing East of Estates Dr							
1-1: ROW Clearing	364	2,781	84.5	0.61	17.8	8.11	28.6
1-2: Roads and Access	4.66	67.2	45.1	0.26	66.0	549	12.5
1-3: Guard Structures	37.5	304	299	1.72	55.6	21.0	81.1
1-4: Foundations	25.6	526	340	1.40	114.6	806	68.4
1-5: Structures Replacement	559	2,238	3,453	808	248	1,373	491
1-6: Transition Structures - South of Park	6.28	53.6	61.1	0.21	4.89	2.85	9.95
1-7: Transition Structures - North of Park	6.28	53.6	61.1	0.21	4.89	2.85	9.95
1-8: Riser Structures	12.6	107	122	0.41	9.77	5.71	19.9
1-9: Conductor Replacement	1,300	5,593	4,904	749	383	258	1,095
1-10: Restoration	0.19	7.72	11.0	0.12	5.57	1.57	5.77
Phase/Activity #1 Total	**2,315**	**11,730**	**9,381**	**1,563**	**910**	**3,028**	**1,822**
2026 Total[f]	**457**	**3,286**	**714**	**117**	**144**	**872**	**133**
2027 Total[f]	**1,301**	**6,040**	**6,554**	**1,125**	**597**	**2,044**	**1,214**
2028 Total[f]	**557**	**2,400**	**2,106**	**321**	**166**	**111**	**471**
2029 Total[f]	**0.10**	**3.86**	**5.52**	**0.06**	**2.79**	**0.78**	**2.88**
2030 Total[f]	**0.02**	**0.97**	**1.38**	**0.01**	**0.70**	**0.20**	**0.72**

Table A5.3-1. Project Emissions Summary

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Average Daily Emissions (lbs/day)[a]						Annual Emissions (metric tons/year)[c]
	ROG	CO	NOx	SOx	PM_{10}[b]	$PM_{2.5}$[b]	CO_2e
Phase/Activity #2 - Rebuild Western Extent of Lines as Underground - West of Estates Dr							
2-1: Mobilization and Survey	5.62	82.3	5.86	0.21	21.4	5.55	9.66
2-2: Vaults	195	1,552	1,322	5.86	97.5	56.1	283
2-3: Trenching and Duct Bank	755	7,103	5,072	21.9	503	242	1,041
2-4: Cable Installation and Splicing	36.0	495	280	1.63	124	39.7	74.0
2-5: Cable System Comissioning and Testing	0.7	39	4	0.17	19	4.9	8.0
2-6: Restoration and Paving	10.2	155	89.5	0.33	24.8	9.54	15.8
2-7: Inspections	0.59	48.2	3.12	0.20	23.8	6.06	9.12
2-8: Truck Drivers/Hauling	3.23	15.2	360	3.00	87.9	27.3	150
2-9: Replant/Water Landscape Trees	0.10	2.36	8.26	0.08	2.82	0.83	3.77
Phase/Activity #2 Total	**1,007**	**9,491**	**7,145**	**33.4**	**904**	**393**	**1,594**
2026 Total[f]	**197**	**1,791**	**1,352**	**6.33**	**155**	**69.9**	**303**
2027 Total[f]	**795**	**7,463**	**5,675**	**26.1**	**675**	**301**	**1,249**
2028 Total[f]	**14.4**	**236**	**114**	**0.87**	**72**	**21.6**	**40**
2029 Total[f]	**0.04**	**0.98**	**3.44**	**0.03**	**1.17**	**0.35**	**1.57**
2030 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Phase/Activity #3 - Remove Existing Structures and Conductors West of Estates Dr							
3-1: ROW Clearing	5.65	51.4	1.94	0.02	0.51	0.19	0.72
3-2: Structure Removal	64.2	537	607	1.81	34.3	25.0	87.1
3-3: Restoration	0.02	1.23	0.57	0.01	0.62	0.16	0.43
Phase/Activity #3 Total	**69.8**	**590**	**609**	**1.84**	**35.5**	**25.4**	**88.3**
2026 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2027 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2028 Total[f]	**69.8**	**590**	**609**	**1.84**	**35.5**	**25.4**	**88.3**
2029 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2030 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Phase/Activity #4a - Construction Activities at Moraga Substation							
4a-1: Equipment Delivery and Setup	0.01	0.08	0.07	0.00	0.04	0.01	0.04
4a-2: Equipment Installation	0.07	5.63	0.36	0.02	2.78	0.71	2.24
4a-3: Dress/Test/Wire Equipment	0.07	5.63	0.36	0.02	2.78	0.71	2.24
4a-4: Equipment Removal	0.01	0.08	0.07	0.00	0.04	0.01	0.04
4a-5: Inspections	0.02	1.41	0.09	0.01	0.70	0.18	0.27
Phase/Activity #4a Total	**0.17**	**12.8**	**0.96**	**0.05**	**6.35**	**1.62**	**4.83**

Table A5.3-1. Project Emissions Summary

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Average Daily Emissions (lbs/day)[a]						Annual Emissions (metric tons/year)[c]
	ROG	CO	NOx	SOx	PM_{10}[b]	$PM_{2.5}$[b]	CO_2e
2026 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2027 Total[f]	**0.15**	**7.52**	**1.06**	**0.03**	**3.32**	**0.87**	**2.71**
2028 Total[f]	**0.11**	**6.62**	**0.75**	**0.03**	**3.07**	**0.79**	**2.20**
2029 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2030 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Phase/Activity #4b - Construction Activities at Oakland X Substation							
4b-1: Equipment Delivery and Setup	0.08	1.41	0.77	0.00	0.22	0.08	0.16
4b-2: Equipment Installation	0.37	29.3	1.98	0.12	13.9	3.55	5.55
4b-3: Dress/Test/Wire Equipment	0.18	14.6	0.99	0.06	6.96	1.77	2.77
4b-4: Equipment Removal	0.01	0.08	0.07	0.00	0.04	0.01	0.04
4b-5: Inspections	0.14	10.11	0.78	0.04	4.19	1.07	1.93
Phase/Activity #4b Total	**0.79**	**55.5**	**4.59**	**0.23**	**25.3**	**6.48**	**10.5**
2026 Total[f]	**ary**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2027 Total[f]	**0.36**	**23.4**	**2.25**	**0.09**	**10.7**	**2.74**	**4.33**
2028 Total[f]	**0.42**	**32.1**	**2.34**	**0.13**	**14.7**	**3.74**	**6.13**
2029 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2030 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

[a] To facilitate comparison to the BAAQMD's significance thresholds, the project's annual construction emissions were divided by the maximum number of days construction activity would occur during the year, as determined using the schedule depicted in Appendix A, Table 3.

[b] PM_{10} and $PM_{2.5}$ emissions represent both exhaust and fugitive dust emissions, even though the BAAQMD's significance thresholds are specific to exhaust.

[c] GHG emissions are evaluated on an annual basis. Therefore, emissions presented are the sum of all emissions occurring within a given year, regardless of whether an activity is occurring sequentially or concurrently during that year.

[d] To facilitate comparison to the SCAQMD's significance threshold, the project's total construction emissions were divided by 30 years and added to the project's operation emissions, which are estimated in Appendix A, Table 16.

[e] Emissions presented are the sum of all emissions occurring within the construction phase, regardless of whether an activity is occurring sequentially or concurrently.

[f] Emissions were allotted to specific years based on the schedule depicted in Appendix A, Table 3, as summarized below:

Total Days:	458
Total Months:	43
Months per Year:	
Construction Year 2026 =	4
Construction Year 2027 =	12
Construction Year 2028 =	12
Construction Year 2029 =	12
Construction Year 2030 =	3

NA = Not available (i.e., no significance threshold exists)

Table A5.3-2. Project Emissions Summary with Applicant-Proposed Measures[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Average Daily Emissions (lbs/day)[a]						Annual Emissions (metric tons/year)[c]
	ROG	CO	NOx	SOx	PM_{10}[b]	$PM_{2.5}$[b]	CO_2e
Project Emissions							
Construction Year 2026	15.4	119	23.9	2.89	5.9	11.2	436
Construction Year 2027	16.4	106	49	9.0	9.3	10.7	2,471
Construction Year 2028	5.02	25.5	11.7	2.53	2.3	1.3	608
Construction Year 2029	0.00	0.04	0.07	0.00	0.03	0.01	4.45
Construction Year 2030	0.00	0.03	0.04	0.00	0.02	0.01	0.72
Maximum Average Daily Emissions (lbs/day)	**16.4**	**119**	**49**	**9.0**	**9.3**	**11.2**	**NA**
BAAQMD Significance Threshold (lbs/day)	**54**	**NA**	**54**	**NA**	**82**	**54**	**NA**
30-Year Amortized Emissions (metric tons/year)[d]	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**131**
SCAQMD Significance Threshold (metric tons/year)	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**10,000**
Exceeds Threshold (Y/N)?	**N**	**N**	**N**	**N**	**N**	**N**	**N**
Phase	**Emissions (lbs/phase)[e]**						**Emissions (metric tons/ phase)[e]**
Phase/Activity #1 - Rebuild Lines Overhead and Remove Existing East of Estates Dr							
1-1: ROW Clearing	364	2,781	84.5	0.61	17.8	8.11	28.6
1-2: Roads and Access	4.66	67.2	39.6	0.26	34.5	249	12.5
1-3: Guard Structures	37.5	304	210	1.72	55.6	21.0	81.1
1-4: Foundations	25.6	526	220	1.40	71.2	371	68.4
1-5: Structures Replacement	559	2,238	1,755	808	177	665	491
1-6: Transition Structures - South of Park	6.28	53.6	13.0	0.21	4.89	2.85	9.95
1-7: Transition Structures - North of Park	6.28	53.6	13.0	0.21	4.89	2.85	9.95
1-8: Riser Structures	12.6	107	26	0.41	9.77	5.71	19.9
1-9: Conductor Replacement	1,300	5,593	2,985	749	383	253	1,095
1-10: Restoration	0.19	7.72	11.0	0.12	5.57	1.57	5.77
Phase/Activity #1 Total	**2,315**	**11,730**	**5,356**	**1,563**	**765**	**1,581**	**1,822**
2026 Total[f]	**457**	**3,286**	**436**	**117**	**96**	**408**	**133**
2027 Total[f]	**1,301**	**6,040**	**3,630**	**1,125**	**499**	**1,062**	**1,214**
2028 Total[f]	**557**	**2,400**	**1,283**	**321**	**166**	**109**	**471**
2029 Total[f]	**0.10**	**3.86**	**5.52**	**0.06**	**2.79**	**0.78**	**2.88**
2030 Total[f]	**0.02**	**0.97**	**1.38**	**0.01**	**0.70**	**0.20**	**0.72**

Table A5.3-2. Project Emissions Summary with Applicant-Proposed Measures[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Average Daily Emissions (lbs/day)[a]						Annual Emissions (metric tons/year)[c]
	ROG	CO	NOx	SOx	PM_{10}[b]	$PM_{2.5}$[b]	CO_2e
Phase/Activity #2 - Rebuild Western Extent of Lines as Underground - West of Estates Dr							
2-1: Mobilization and Survey	5.62	82.3	5.86	0.21	21.4	5.55	9.66
2-2: Vaults	195	1,552	437	5.86	97.5	56.1	283
2-3: Trenching and Duct Bank	755	7,103	2,226	21.9	503	242	1,041
2-4: Cable Installation and Splicing	36.0	495	239	1.63	124	39.7	74.0
2-5: Cable System Comissioning and Testing	0.7	39	4	0.17	19	4.9	8.0
2-6: Restoration and Paving	10.2	155	89.5	0.33	24.8	9.54	15.8
2-7: Inspections	0.59	48.2	3.12	0.20	23.8	6.06	9.12
2-8: Truck Drivers/Hauling	3.23	15.2	360	3.00	87.9	27.3	150
2-9: Replant/Water Landscape Trees	0.10	2.36	8.26	0.08	2.82	0.83	3.77
Phase/Activity #2 Total	**1,007**	**9,491**	**3,375**	**33.4**	**904**	**393**	**1,594**
2026 Total[f]	**197**	**1,791**	**583**	**6.33**	**155**	**69.9**	**303**
2027 Total[f]	**795**	**7,463**	**2,689**	**26.1**	**675**	**301**	**1,249**
2028 Total[f]	**14.4**	**236**	**99**	**0.87**	**72**	**21.6**	**40**
2029 Total[f]	**0.04**	**0.98**	**3.44**	**0.03**	**1.17**	**0.35**	**1.57**
2030 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Phase/Activity #3 - Remove Existing Structures and Conductors West of Estates Dr							
3-1: ROW Clearing	5.65	51.4	1.94	0.02	0.51	0.19	0.72
3-2: Structure Removal	64.2	537	103	1.81	34.3	25.0	87.1
3-3: Restoration	0.02	1.23	0.57	0.01	0.62	0.16	0.43
Phase/Activity #3 Total	**69.8**	**590**	**106**	**1.84**	**35.5**	**25.4**	**88.3**
2026 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2027 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2028 Total[f]	**69.8**	**590**	**106**	**1.84**	**35.5**	**25.4**	**88.3**
2029 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2030 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Phase/Activity #4a - Construction Activities at Moraga Substation							
4a-1: Equipment Delivery and Setup	0.01	0.08	0.07	0.00	0.04	0.01	0.04
4a-2: Equipment Installation	0.07	5.63	0.36	0.02	2.78	0.71	2.24
4a-3: Dress/Test/Wire Equipment	0.07	5.63	0.36	0.02	2.78	0.71	2.24
4a-4: Equipment Removal	0.01	0.08	0.07	0.00	0.04	0.01	0.04
4a-5: Inspections	0.02	1.41	0.09	0.01	0.70	0.18	0.27
Phase/Activity #4a Total	**0.17**	**12.8**	**0.96**	**0.05**	**6.35**	**1.62**	**4.83**
2026 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Table A5.3-2. Project Emissions Summary with Applicant-Proposed Measures[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Average Daily Emissions (lbs/day)[a]						Annual Emissions (metric tons/year)[c]
	ROG	CO	NOx	SOx	PM_{10}[b]	$PM_{2.5}$[b]	CO_2e
2027 Total[f]	**0.15**	**7.52**	**1.06**	**0.03**	**3.32**	**0.87**	**2.71**
2028 Total[f]	**0.11**	**6.62**	**0.75**	**0.03**	**3.07**	**0.79**	**2.20**
2029 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2030 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Phase/Activity #4b - Construction Activities at Oakland X Substation							
4b-1: Equipment Delivery and Setup	0.08	1.41	0.77	0.00	0.22	0.08	0.16
4b-2: Equipment Installation	0.37	29.3	1.98	0.12	13.9	3.55	5.55
4b-3: Dress/Test/Wire Equipment	0.18	14.6	0.99	0.06	6.96	1.77	2.77
4b-4: Equipment Removal	0.01	0.08	0.07	0.00	0.04	0.01	0.04
4b-5: Inspections	0.14	10.11	0.78	0.04	4.19	1.07	1.93
Phase/Activity #4b Total	**0.79**	**55.5**	**4.59**	**0.23**	**25.3**	**6.48**	**10.5**
2026 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2027 Total[f]	**0.36**	**23.4**	**2.25**	**0.09**	**10.7**	**2.74**	**4.33**
2028 Total[f]	**0.42**	**32.1**	**2.34**	**0.13**	**14.7**	**3.74**	**6.13**
2029 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2030 Total[f]	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

[a] To facilitate comparison to the BAAQMD's significance thresholds, the project's annual construction emissions were divided by the maximum number of days construction activity would occur during the year, as determined using the schedule depicted in Appendix A, Table 3.

[b] PM_{10} and $PM_{2.5}$ emissions represent both exhaust and fugitive dust emissions, even though the BAAQMD's significance thresholds are specific to exhaust.

[c] GHG emissions are evaluated on an annual basis. Therefore, emissions presented are the sum of all emissions occurring within a given year, regardless of whether an activity is occurring sequentially or concurrently during that year.

[d] To facilitate comparison to the SCAQMD's significance threshold, the project's total construction emissions were divided by 30 years and added to the project's operation emissions, which are estimated in Appendix A, Table 16.

[e] Emissions presented are the sum of all emissions occurring within the construction phase, regardless of whether an activity is occurring sequentially or concurrently.

[f] Emissions were allotted to specific years based on the schedule depicted in Appendix A, Table 3, as summarized below:

Total Days:	458
Total Months:	43
Months per Year:	
Construction Year 2026 =	4
Construction Year 2027 =	12
Construction Year 2028 =	12
Construction Year 2029 =	12
Construction Year 2030 =	3

[g] Emissions incorporate Applicant-proposed Measures to reduce fugitive dust and construction equipment exhaust emissions, as applicable.

NA = Not available (i.e., no significance threshold exists)

Table A5.3-3. Preliminary Construction Schedule[a]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Duration (Days)[b]	2026												2027											
		Months in which Activity Occurs												Months in which Activity Occurs											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Rebuild Lines Overhead and Remove Existing (East of Estates Dr)																									
ROW Clearing (vegetation, tree trimming)	30										X	X													
Roads and Access (Construction Areas, Pulling Sites, Light Road Improvements, rocking, shaker plates)	25											X													
Guard Structures	47												X	X	X	X	X	X	X						
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)	135												X	X	X	X	X	X	X						
Structures Replacement (Poles and Towers)	135												X	X	X	X	X	X	X						
Transition Structures Estates/Park - South of Park (C3/C4)	10																		X						
Transition Structures Estates/Park - North of Park (C1/C2)	10																			X					
Riser Structures at Oakland X	20																				X				
Conductor Replacement	133																					X	X	X	X
Restoration (inc. SWPPP inspections)	26																								
Rebuild Western Extent of Lines as Underground (West of Estates Dr)																									
Mobilization and Survey (Construction Marking)	30									X	X														
Vaults - C1/C2	60											X	X	X											
Vaults - C3/C4	60																	X	X	X					
Trenching and Duct Bank - C1/C2	120											X	X	X	X	X	X								
Trenching and Duct Bank - C3/C4	120																	X	X	X	X	X	X		
Cable Installation Pulling - C1/C2 (6 segments)	15																				X				
Cable Installation Pulling - C3/C4 (6 segments)	15																								X
Cable Installation Splicing (5 locations) - C1/C2	75																				X	X	X	X	
Cable InstallationSplicing (5 locations) - C3/C4	75																								X
Cable System Commissioning & Testing	15																								
Restoration and Paving	30																X						X		
Inspectors	317											X	X	X	X	X	X	X	X	X	X	X	X	X	X
Truck Drivers/Hauling	122											X	X	X	X	X	X	X	X	X	X	X	X		
Replant/Water Landscape Trees (2 years)	24																							X	X
Remove Existing Structures and Conductors (West of Estates Dr)																									
ROW Clearing	3																								
Structure Removal (Poles and Towers)	40																								
Restoration	5																								
Construction Activities at Moraga Substation																									
Equipment Delivery and Setup	1																						X		
Equipment Installation	40																						X	X	
Dress/Test/Wire Equipment	40																								X
Equipment Removal	1																								
Inspections	20																								
Construction Activities at Oakland X Substation																									
Equipment Delivery and Setup	1																						X		
Equipment Installation	80																						X	X	X
Dress/Test/Wire Equipment	40																								
Equipment Removal	1																								
Inspections	40																								
Maximum Days of Activity per Month[c]	**458**																								

Table A5.3-3. Preliminary Construction Schedule[a]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Duration (Days)[b]	2028												2029											
		Months in which Activity Occurs												Months in which Activity Occurs											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Rebuild Lines Overhead and Remove Existing (East of Estates Dr)																									
ROW Clearing (vegetation, tree trimming)	30																								
Roads and Access (Construction Areas, Pulling Sites, Light Road Improvements, rocking, shaker plates)	25																								
Guard Structures	47																								
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)	135																								
Structures Replacement (Poles and Towers)	135																								
Transition Structures Estates/Park - South of Park (C3/C4)	10																								
Transition Structures Estates/Park - North of Park (C1/C2)	10																								
Riser Structures at Oakland X	20																								
Conductor Replacement	133	X	X	X																					
Restoration (inc. SWPPP inspections)	26				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rebuild Western Extent of Lines as Underground (West of Estates Dr)																									
Mobilization and Survey (Construction Marking)	30																								
Vaults - C1/C2	60																								
Vaults - C3/C4	60																								
Trenching and Duct Bank - C1/C2	120																								
Trenching and Duct Bank - C3/C4	120																								
Cable Installation Pulling - C1/C2 (6 segments)	15																								
Cable Installation Pulling - C3/C4 (6 segments)	15																								
Cable Installation Splicing (5 locations) - C1/C2	75																								
Cable InstallationSplicing (5 locations) - C3/C4	75	X	X	X																					
Cable System Commissioning & Testing	15				X																				
Restoration and Paving	30																								
Inspectors	317	X	X	X	X																				
Truck Drivers/Hauling	122																								
Replant/Water Landscape Trees (2 years)	24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Remove Existing Structures and Conductors (West of Estates Dr)																									
ROW Clearing	3					X																			
Structure Removal (Poles and Towers)	40					X	X																		
Restoration	5							X																	
Construction Activities at Moraga Substation																									
Equipment Delivery and Setup	1																								
Equipment Installation	40																								
Dress/Test/Wire Equipment	40	X																							
Equipment Removal	1	X																							
Inspections	20		X																						
Construction Activities at Oakland X Substation																									
Equipment Delivery and Setup	1																								
Equipment Installation	80	X																							
Dress/Test/Wire Equipment	40	X	X																						
Equipment Removal	1		X																						
Inspections	40		X	X																					
Maximum Days of Activity per Month[c]	**458**																								

Table A5.3-3. Preliminary Construction Schedule[a]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Duration (Days)[b]	2030												2026											
		Months in which Activity Occurs												Approximate Days of Activity per Month											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Rebuild Lines Overhead and Remove Existing (East of Estates Dr)																									
ROW Clearing (vegetation, tree trimming)	30																						15	15	
Roads and Access (Construction Areas, Pulling Sites, Light Road Improvements, rocking, shaker plates)	25																							25	
Guard Structures	47																								7
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)	135																								19
Structures Replacement (Poles and Towers)	135																								19
Transition Structures Estates/Park - South of Park (C3/C4)	10																								
Transition Structures Estates/Park - North of Park (C1/C2)	10																								
Riser Structures at Oakland X	20																								
Conductor Replacement	133																								
Restoration (inc. SWPPP inspections)	26	X	X	X																					
Rebuild Western Extent of Lines as Underground (West of Estates Dr)																									
Mobilization and Survey (Construction Marking)	30																					15	15		
Vaults - C1/C2	60																							20	20
Vaults - C3/C4	60																								
Trenching and Duct Bank - C1/C2	120																							20	20
Trenching and Duct Bank - C3/C4	120																								
Cable Installation Pulling - C1/C2 (6 segments)	15																								
Cable Installation Pulling - C3/C4 (6 segments)	15																								
Cable Installation Splicing (5 locations) - C1/C2	75																								
Cable InstallationSplicing (5 locations) - C3/C4	75																								
Cable System Commissioning & Testing	15																								
Restoration and Paving	30																								
Inspectors	317																							18	18
Truck Drivers/Hauling	122																							10	10
Replant/Water Landscape Trees (2 years)	24																								
Remove Existing Structures and Conductors (West of Estates Dr)																									
ROW Clearing	3																								
Structure Removal (Poles and Towers)	40																								
Restoration	5																								
Construction Activities at Moraga Substation																									
Equipment Delivery and Setup	1																								
Equipment Installation	40																								
Dress/Test/Wire Equipment	40																								
Equipment Removal	1																								
Inspections	20																								
Construction Activities at Oakland X Substation																									
Equipment Delivery and Setup	1																								
Equipment Installation	80																								
Dress/Test/Wire Equipment	40																								
Equipment Removal	1																								
Inspections	40																								
Maximum Days of Activity per Month[c]	**458**																					**15**	**15**	**25**	**20**

Table A5.3-3. Preliminary Construction Schedule[a]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Duration (Days)[b]	2027												2028											
		Approximate Days of Activity per Month												Approximate Days of Activity per Month											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Rebuild Lines Overhead and Remove Existing (East of Estates Dr)																									
ROW Clearing (vegetation, tree trimming)	30																								
Roads and Access (Construction Areas, Pulling Sites, Light Road Improvements, rocking, shaker plates)	25																								
Guard Structures	47	7	7	7	7	7	7																		
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)	135	19	19	19	19	19	19																		
Structures Replacement (Poles and Towers)	135	19	19	19	19	19	19																		
Transition Structures Estates/Park - South of Park (C3/C4)	10						10																		
Transition Structures Estates/Park - North of Park (C1/C2)	10							10																	
Riser Structures at Oakland X	20								20																
Conductor Replacement	133									19	19	19	19	19	19	19									
Restoration (inc. SWPPP inspections)	26																1	1	1	1	1	1	1	1	1
Rebuild Western Extent of Lines as Underground (West of Estates Dr)																									
Mobilization and Survey (Construction Marking)	30																								
Vaults - C1/C2	60	20																							
Vaults - C3/C4	60					20	20	20																	
Trenching and Duct Bank - C1/C2	120	20	20	20	20																				
Trenching and Duct Bank - C3/C4	120					20	20	20	20	20	20														
Cable Installation Pulling - C1/C2 (6 segments)	15								15																
Cable Installation Pulling - C3/C4 (6 segments)	15												15												
Cable Installation Splicing (5 locations) - C1/C2	75								19	19	19	19													
Cable InstallationSplicing (5 locations) - C3/C4	75												19	19	19	19									
Cable System Commissioning & Testing	15																15								
Restoration and Paving	30				15						15														
Inspectors	317	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18								
Truck Drivers/Hauling	122	10	10	10	10	10	10	10	10	10	10														
Replant/Water Landscape Trees (2 years)	24											1	1	1	1	1	1	1	1	1	1	1	1	1	1
Remove Existing Structures and Conductors (West of Estates Dr)																									
ROW Clearing	3																	3							
Structure Removal (Poles and Towers)	40																	20	20						
Restoration	5																			5					
Construction Activities at Moraga Substation																									
Equipment Delivery and Setup	1										1														
Equipment Installation	40										20	20													
Dress/Test/Wire Equipment	40												20	20											
Equipment Removal	1													1											
Inspections	20														20										
Construction Activities at Oakland X Substation																									
Equipment Delivery and Setup	1										1														
Equipment Installation	80										20	20	20	20											
Dress/Test/Wire Equipment	40													20	20										
Equipment Removal	1														1										
Inspections	40														20	20									
Maximum Days of Activity per Month[c]	**458**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**18**	**20**	**20**	**5**	**1**	**1**	**1**	**1**	**1**

Table A5.3-3. Preliminary Construction Schedule[a]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Duration (Days)[b]	2029												2030											
		Approximate Days of Activity per Month												Approximate Days of Activity per Month											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Rebuild Lines Overhead and Remove Existing (East of Estates Dr)																									
ROW Clearing (vegetation, tree trimming)	30																								
Roads and Access (Construction Areas, Pulling Sites, Light Road Improvements, rocking, shaker plates)	25																								
Guard Structures	47																								
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)	135																								
Structures Replacement (Poles and Towers)	135																								
Transition Structures Estates/Park - South of Park (C3/C4)	10																								
Transition Structures Estates/Park - North of Park (C1/C2)	10																								
Riser Structures at Oakland X	20																								
Conductor Replacement	133																								
Restoration (inc. SWPPP inspections)	26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									
Rebuild Western Extent of Lines as Underground (West of Estates Dr)																									
Mobilization and Survey (Construction Marking)	30																								
Vaults - C1/C2	60																								
Vaults - C3/C4	60																								
Trenching and Duct Bank - C1/C2	120																								
Trenching and Duct Bank - C3/C4	120																								
Cable Installation Pulling - C1/C2 (6 segments)	15																								
Cable Installation Pulling - C3/C4 (6 segments)	15																								
Cable Installation Splicing (5 locations) - C1/C2	75																								
Cable InstallationSplicing (5 locations) - C3/C4	75																								
Cable System Commissioning & Testing	15																								
Restoration and Paving	30																								
Inspectors	317																								
Truck Drivers/Hauling	122																								
Replant/Water Landscape Trees (2 years)	24	1	1	1	1	1	1	1	1	1	1														
Remove Existing Structures and Conductors (West of Estates Dr)																									
ROW Clearing	3																								
Structure Removal (Poles and Towers)	40																								
Restoration	5																								
Construction Activities at Moraga Substation																									
Equipment Delivery and Setup	1																								
Equipment Installation	40																								
Dress/Test/Wire Equipment	40																								
Equipment Removal	1																								
Inspections	20																								
Construction Activities at Oakland X Substation																									
Equipment Delivery and Setup	1																								
Equipment Installation	80																								
Dress/Test/Wire Equipment	40																								
Equipment Removal	1																								
Inspections	40																								
Maximum Days of Activity per Month[c]	**458**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**									

Table A5.3-3. Preliminary Construction Schedule[a]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase	Duration (Days)[b]	2026												2027											
		Months in which Activity Occurs												Months in which Activity Occurs											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12

[a] This schedule depicts the periods during which construction activities could occur. It is expected that construction activities will actually occur intermittently within the identified periods. The final project construction schedule can only be determined once the Commission's staff issue a full Notice to Proceed, all Applicant-proposed measures and any other environmental mitigation measures have been taken into account, materials needed for construction have been delivered and

[b] Specific notes regarding several of the durations are as follows:

- Activity for Overhead Guard Structures will occur intermittently during the same periods as activity for Overhead Foundations and Structures.
- Activity for Overhead Restoration will occur upfront, and then monthly for 2 years.
- Activity for Underground Restoration and Paving will occur in 2, 15-day segments (one for C1/C2 and one for C3/C4).
- Activity for Underground Inspectors and Truck Drivers/Hauling will be distributed during the period shown.
- Activity for Underground Replant/Water Landscape Trees (2 years) will occur for 2 weeks upfront and then 1 day per month for 2 years.

[c] The maximum days of activity per month was estimated assuming an even distribution of days within the months in which activities are expected to occur.

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030
ROW Clearing (vegetation, tree trimming)												
10-Cu Dump Truck (remove green waste)	Heavy-duty Diesel	NA	NA	3	30	NA	60	2	0	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	5	30	NA	60	2	0	0	0	0
Chain Saws	Chainsaws	1.86	0.70	10	30	4	NA	2	0	0	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	5	30	4	NA	2	0	0	0	0
Blowers	Leaf Blowers/Vacuums	1.79	0.94	5	30	4	NA	2	0	0	0	0
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	5	30	4	NA	2	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	30	NA	60	2	0	0	0	0
Roads and Access: Construction Areas, Pulling Sites, Light Road Improvements for 3 of 12 miles												
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	10	NA	45	1	0	0	0	0
4,000 Gallon Water Truck	Medium-duty Diesel	NA	NA	2	25	NA	50	1	0	0	0	0
¾-Ton Pick-up Truck, 4 × 4 (stand by fire crew)	Heavy-duty Truck	NA	NA	1	10	NA	30	1	0	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	2	4	NA	30	1	0	0	0	0
Skid Steer	Skid Steer Loaders	71	0.37	1	10	5	NA	1	0	0	0	0
325 Excavator	Excavators	36	0.38	1	10	5	NA	1	0	0	0	0
Skip Loader	Rubber Tired Loaders	150	0.36	1	15	5	NA	1	0	0	0	0
D6 Dozer	Tractors/Loaders/Backhoes	84	0.37	1	10	5	NA	1	0	0	0	0
Fugitive Dust	Grading	NA	NA	[m]	25	NA	NA	1	0	0	0	0
Worker Commutes (3/4-ton pick-up)	Heavy-duty Truck	NA	NA	4	25	NA	50	1	0	0	0	0
Light Duty Truck (inspectors)	Light-duty Auto/Truck	NA	NA	1	12	NA	50	1	0	0	0	0
Guard Structures												
Digger Derrick Line Truck	Heavy-duty Diesel	NA	NA	2	47	NA	30	1	6	0	0	0
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	1	47	8	NA	1	6	0	0	0
20,000 Pound Capacity Forklift	Forklifts	82	0.20	1	47	8	NA	1	6	0	0	0
Super Framer 10 Wheel Flat Bed	Heavy-duty Diesel	NA	NA	1	47	NA	1	1	6	0	0	0
Heavy-Duty Vac Truck	Heavy-duty Diesel	NA	NA	2	47	NA	1	1	6	0	0	0
Generator	Generator Sets	14	0.74	1	47	8	NA	1	6	0	0	0
Flasher Board for Traffic Control	Signal Boards	6	0.82	2	47	8	NA	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	47	NA	50	1	6	0	0	0
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	47	NA	50	1	6	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	4	47	NA	50	1	6	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	6	47	NA	30	1	6	0	0	0
1-Ton Crew Cab Pickup	Heavy-duty Truck	NA	NA	4	47	NA	30	1	6	0	0	0
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)												
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	135	NA	45	1	6	0	0	0
Auger Truck[h]	Bore/Drill Rigs	83	0.50	1	15	8	NA	1	6	0	0	0
10-Cu Concrete Mixer Truck	Heavy-duty Diesel	NA	NA	2	15	NA	75	1	6	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	30	1	6	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	135	NA	30	1	6	0	0	0
Skid Steer/Front Loader[h]	Skid Steer Loaders	71	0.37	1	135	8	NA	1	6	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	1	135	NA	15	1	6	0	0	0
Backhoe/Front Loader	Tractors/Loaders/Backhoes	84	0.37	1	135	8	NA	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	1	6	0	0	0

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment, g/mile for vehicles, and g/LTO for helicopters)[k]						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
ROW Clearing (vegetation, tree trimming)														
10-Cu Dump Truck (remove green waste)	Heavy-duty Diesel	NA	NA	3	30	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Boom Truck	Heavy-duty Diesel	NA	NA	5	30	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Chain Saws	Chainsaws	1.86	0.70	10	30	4	NA	47.48	128.98	1.45	0.01	0.41	0.55	694.41
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	5	30	4	NA	15.90	278.24	2.11	0.01	0.01	0.01	647.75
Blowers	Leaf Blowers/Vacuums	1.79	0.94	5	30	4	NA	40.08	135.48	0.64	0.01	0.44	0.58	908.57
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	5	30	4	NA	14.81	304.46	4.86	0.01	0.08	0.10	812.30
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	30	NA	60	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Roads and Access: Construction Areas, Pulling Sites, Light Road Improvements for 3 of 12 miles														
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	10	NA	45	0.02	0.08	1.80	0.02	3.32	29.08	1,659.19
4,000 Gallon Water Truck	Medium-duty Diesel	NA	NA	2	25	NA	50	0.02	0.10	1.02	0.01	2.96	26.15	1,189.11
¾-Ton Pick-up Truck, 4 × 4 (stand by fire crew)	Heavy-duty Truck	NA	NA	1	10	NA	30	0.09	0.74	0.63	0.01	4.72	43.54	775.74
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	2	4	NA	30	0.02	0.08	1.80	0.02	4.76	43.55	1,659.19
Skid Steer	Skid Steer Loaders	71	0.37	1	10	5	NA	0.13	3.25	1.81	0.01	0.05	0.05	530.34
325 Excavator	Excavators	36	0.38	1	10	5	NA	0.39	4.22	3.41	0.01	0.10	0.09	589.12
Skip Loader	Rubber Tired Loaders	150	0.36	1	15	5	NA	0.21	3.29	1.40	0.01	0.07	0.07	528.13
D6 Dozer	Tractors/Loaders/Backhoes	84	0.37	1	10	5	NA	0.18	3.48	1.89	0.01	0.06	0.06	531.42
Fugitive Dust	Grading	NA	NA	[m]	25	NA	NA	--	--	--	--	1.54	0.17	--
Worker Commutes (3/4-ton pick-up)	Heavy-duty Truck	NA	NA	4	25	NA	50	0.09	0.74	0.63	0.01	2.99	26.17	775.74
Light Duty Truck (inspectors)	Light-duty Auto/Truck	NA	NA	1	12	NA	50	0.01	0.64	0.04	0.00	2.91	26.13	266.53
Guard Structures														
Digger Derrick Line Truck	Heavy-duty Diesel	NA	NA	2	47	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	1	47	8	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
20,000 Pound Capacity Forklift	Forklifts	82	0.20	1	47	8	NA	0.25	3.58	2.34	0.01	0.11	0.10	528.81
Super Framer 10 Wheel Flat Bed	Heavy-duty Diesel	NA	NA	1	47	NA	1	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Heavy-Duty Vac Truck	Heavy-duty Diesel	NA	NA	2	47	NA	1	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Generator	Generator Sets	14	0.74	1	47	8	NA	0.54	2.86	4.32	0.01	0.17	0.16	570.39
Flasher Board for Traffic Control	Signal Boards	6	0.82	2	47	8	NA	0.55	3.47	4.14	0.01	0.16	0.15	570.37
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	47	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	47	NA	50	0.02	0.10	1.02	0.01	0.37	0.10	1,189.11
Worker Commutes	Light-duty Truck	NA	NA	4	47	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	6	47	NA	30	0.09	0.74	0.63	0.01	0.40	0.12	775.74
1-Ton Crew Cab Pickup	Heavy-duty Truck	NA	NA	4	47	NA	30	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)														
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	135	NA	45	0.02	0.08	1.80	0.02	0.97	5.51	1,659.19
Auger Truck[h]	Bore/Drill Rigs	83	0.50	1	15	8	NA	0.13	3.25	1.64	0.01	0.04	0.04	531.52
10-Cu Concrete Mixer Truck	Heavy-duty Diesel	NA	NA	2	15	NA	75	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	30	0.09	0.74	0.63	0.01	1.20	8.17	775.74
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	135	NA	30	0.02	0.08	1.80	0.02	1.24	8.19	1,659.19
Skid Steer/Front Loader[h]	Skid Steer Loaders	71	0.37	1	135	8	NA	0.13	3.25	1.81	0.01	0.05	0.05	530.34
Boom Truck	Heavy-duty Diesel	NA	NA	1	135	NA	15	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Backhoe/Front Loader	Tractors/Loaders/Backhoes	84	0.37	1	135	8	NA	0.18	3.48	1.89	0.01	0.06	0.06	531.42
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	0.01	0.64	0.04	0.00	2.71	24.21	266.53

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
ROW Clearing (vegetation, tree trimming)													
10-Cu Dump Truck (remove green waste)	Heavy-duty Diesel	NA	NA	3	30	NA	60	0.19	0.90	21.44	0.18	5.24	1.63
Boom Truck	Heavy-duty Diesel	NA	NA	5	30	NA	60	0.32	1.51	35.74	0.30	8.73	2.71
Chain Saws	Chainsaws	1.86	0.70	10	30	4	NA	163.54	444.26	4.99	0.03	1.41	1.89
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	5	30	4	NA	79.56	1,392.30	10.56	0.05	0.05	0.05
Blowers	Leaf Blowers/Vacuums	1.79	0.94	5	30	4	NA	89.20	301.53	1.42	0.02	0.98	1.29
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	5	30	4	NA	31.02	637.67	10.18	0.02	0.17	0.21
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	30	NA	60	0.03	2.53	0.16	0.01	1.25	0.32
Roads and Access: Construction Areas, Pulling Sites, Light Road Improvements for 3 of 12 miles													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	10	NA	45	0.02	0.08	1.79	0.01	3.29	28.85
4,000 Gallon Water Truck	Medium-duty Diesel	NA	NA	2	25	NA	50	0.13	0.53	5.64	0.06	16.30	144.14
¾-Ton Pick-up Truck, 4 × 4 (stand by fire crew)	Heavy-duty Truck	NA	NA	1	10	NA	30	0.06	0.49	0.42	0.00	3.12	28.79
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	2	4	NA	30	0.01	0.04	0.95	0.01	2.52	23.04
Skid Steer	Skid Steer Loaders	71	0.37	1	10	5	NA	0.39	9.40	5.23	0.01	0.15	0.14
325 Excavator	Excavators	36	0.38	1	10	5	NA	0.59	6.37	5.14	0.01	0.15	0.14
Skip Loader	Rubber Tired Loaders	150	0.36	1	15	5	NA	1.88	29.40	12.48	0.04	0.65	0.60
D6 Dozer	Tractors/Loaders/Backhoes	84	0.37	1	10	5	NA	0.63	11.93	6.46	0.02	0.22	0.20
Fugitive Dust	Grading	NA	NA	[m]	25	NA	NA	--	--	--	--	2.75	0.30
Worker Commutes (3/4-ton pick-up)	Heavy-duty Truck	NA	NA	4	25	NA	50	0.94	8.14	6.96	0.08	33.01	288.46
Light Duty Truck (inspectors)	Light-duty Auto/Truck	NA	NA	1	12	NA	50	0.01	0.84	0.05	0.00	3.84	34.56
Guard Structures													
Digger Derrick Line Truck	Heavy-duty Diesel	NA	NA	2	47	NA	30	0.10	0.47	11.20	0.09	2.73	0.85
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	1	47	8	NA	20.84	139.52	119.74	0.59	4.26	3.91
20,000 Pound Capacity Forklift	Forklifts	82	0.20	1	47	8	NA	3.34	48.65	31.84	0.07	1.52	1.40
Super Framer 10 Wheel Flat Bed	Heavy-duty Diesel	NA	NA	1	47	NA	1	0.00	0.01	0.19	0.00	0.05	0.01
Heavy-Duty Vac Truck	Heavy-duty Diesel	NA	NA	2	47	NA	1	0.00	0.02	0.37	0.00	0.09	0.03
Generator	Generator Sets	14	0.74	1	47	8	NA	4.63	24.56	37.13	0.07	1.49	1.37
Flasher Board for Traffic Control	Signal Boards	6	0.82	2	47	8	NA	4.46	28.30	33.79	0.07	1.32	1.22
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	47	NA	50	0.24	19.85	1.29	0.08	9.80	2.50
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	47	NA	50	0.97	4.01	42.44	0.45	15.21	4.31
Worker Commutes	Light-duty Truck	NA	NA	4	47	NA	50	0.22	15.84	1.23	0.07	6.56	1.68
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	6	47	NA	30	1.59	13.77	11.77	0.14	7.53	2.23
1-Ton Crew Cab Pickup	Heavy-duty Truck	NA	NA	4	47	NA	30	1.06	9.18	7.85	0.09	5.02	1.49
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	135	NA	45	0.22	1.02	24.12	0.20	13.03	73.79
Auger Truck[h]	Bore/Drill Rigs	83	0.50	1	15	8	NA	1.41	35.71	17.99	0.05	0.44	0.41
10-Cu Concrete Mixer Truck	Heavy-duty Diesel	NA	NA	2	15	NA	75	0.08	0.38	8.93	0.07	2.18	0.68
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	30	1.53	13.18	11.27	0.13	21.48	145.93
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	135	NA	30	0.14	0.68	16.08	0.13	11.07	73.12
Skid Steer/Front Loader[h]	Skid Steer Loaders	71	0.37	1	135	8	NA	8.38	202.97	113.02	0.31	3.19	2.94
Boom Truck	Heavy-duty Diesel	NA	NA	1	135	NA	15	0.07	0.34	8.04	0.07	1.96	0.61
Backhoe/Front Loader	Tractors/Loaders/Backhoes	84	0.37	1	135	8	NA	13.62	257.59	139.49	0.37	4.66	4.29
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	0.07	5.70	0.37	0.02	24.23	216.19

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[l]				
								CO_2e	2026	2027	2028	2029	2030
ROW Clearing (vegetation, tree trimming)													
10-Cu Dump Truck (remove green waste)	Heavy-duty Diesel	NA	NA	3	30	NA	60	8.96	1	0	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	5	30	NA	60	14.93	1	0	0	0	0
Chain Saws	Chainsaws	1.86	0.70	10	30	4	NA	1.08	1	0	0	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	5	30	4	NA	1.47	1	0	0	0	0
Blowers	Leaf Blowers/Vacuums	1.79	0.94	5	30	4	NA	0.92	1	0	0	0	0
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	5	30	4	NA	0.77	1	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	30	NA	60	0.48	1	0	0	0	0
Roads and Access: Construction Areas, Pulling Sites, Light Road Improvements for 3 of 12 miles													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	10	NA	45	0.75	1	0	0	0	0
4,000 Gallon Water Truck	Medium-duty Diesel	NA	NA	2	25	NA	50	2.97	1	0	0	0	0
¾-Ton Pick-up Truck, 4 × 4 (stand by fire crew)	Heavy-duty Truck	NA	NA	1	10	NA	30	0.23	1	0	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	2	4	NA	30	0.40	1	0	0	0	0
Skid Steer	Skid Steer Loaders	71	0.37	1	10	5	NA	0.70	1	0	0	0	0
325 Excavator	Excavators	36	0.38	1	10	5	NA	0.40	1	0	0	0	0
Skip Loader	Rubber Tired Loaders	150	0.36	1	15	5	NA	2.14	1	0	0	0	0
D6 Dozer	Tractors/Loaders/Backhoes	84	0.37	1	10	5	NA	0.83	1	0	0	0	0
Fugitive Dust	Grading	NA	NA	[m]	25	NA	NA	--	1	0	0	0	0
Worker Commutes (3/4-ton pick-up)	Heavy-duty Truck	NA	NA	4	25	NA	50	3.88	1	0	0	0	0
Light Duty Truck (inspectors)	Light-duty Auto/Truck	NA	NA	1	12	NA	50	0.16	1	0	0	0	0
Guard Structures													
Digger Derrick Line Truck	Heavy-duty Diesel	NA	NA	2	47	NA	30	4.68	0.14	0.86	0	0	0
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	1	47	8	NA	28.52	0.14	0.86	0	0	0
20,000 Pound Capacity Forklift	Forklifts	82	0.20	1	47	8	NA	3.26	0.14	0.86	0	0	0
Super Framer 10 Wheel Flat Bed	Heavy-duty Diesel	NA	NA	1	47	NA	1	0.08	0.14	0.86	0	0	0
Heavy-Duty Vac Truck	Heavy-duty Diesel	NA	NA	2	47	NA	1	0.16	0.14	0.86	0	0	0
Generator	Generator Sets	14	0.74	1	47	8	NA	2.22	0.14	0.86	0	0	0
Flasher Board for Traffic Control	Signal Boards	6	0.82	2	47	8	NA	2.11	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	47	NA	50	3.76	0.14	0.86	0	0	0
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	47	NA	50	22.36	0.14	0.86	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	4	47	NA	50	3.02	0.14	0.86	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	6	47	NA	30	6.56	0.14	0.86	0	0	0
1-Ton Crew Cab Pickup	Heavy-duty Truck	NA	NA	4	47	NA	30	4.38	0.14	0.86	0	0	0
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	135	NA	45	10.08	0.14	0.86	0	0	0
Auger Truck[h]	Bore/Drill Rigs	83	0.50	1	15	8	NA	2.65	0.14	0.86	0	0	0
10-Cu Concrete Mixer Truck	Heavy-duty Diesel	NA	NA	2	15	NA	75	3.73	0.14	0.86	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	30	6.28	0.14	0.86	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	135	NA	30	6.72	0.14	0.86	0	0	0
Skid Steer/Front Loader[h]	Skid Steer Loaders	71	0.37	1	135	8	NA	15.05	0.14	0.86	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	1	135	NA	15	3.36	0.14	0.86	0	0	0
Backhoe/Front Loader	Tractors/Loaders/Backhoes	84	0.37	1	135	8	NA	17.84	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	1.08	0.14	0.86	0	0	0

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	1	6	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	135	NA	10	1	6	0	0	0
Structures Replacement (Poles and Towers)												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	135	NA	30	1	6	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	135	NA	25	1	6	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	135	NA	25	1	6	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	25	1	6	0	0	0
Hydro Seed Truck	Heavy-duty Diesel	NA	NA	1	20	NA	60	1	6	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	135	5	NA	1	6	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	3	135	8	NA	1	6	0	0	0
Helicopter[b]	UH-60 Blackhawk	NA	NA	3	22	5	NA	1	6	0	0	0
Water Truck[n]	Heavy-duty Diesel	NA	NA	1	22	NA	10	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	1	6	0	0	0
Transition Structures Estates/Park - South of Park (C3/C4)												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0	1	0	0	0
Transition Structures Estates/Park - North of Park (C1/C2)												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0	1	0	0	0
Riser Structures at Oakland X												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	20	NA	30	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	20	NA	25	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	20	NA	25	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	25	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	20	5	NA	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	20	8	NA	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	20	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	20	NA	10	0	1	0	0	0

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment, g/mile for vehicles, and g/LTO for helicopters)[k]						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.01	0.64	0.04	0.00	2.71	24.21	266.53
Worker Commutes	Light-duty Truck	NA	NA	2	135	NA	10	0.01	0.76	0.06	0.00	2.72	24.21	321.14
Structures Replacement (Poles and Towers)														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	135	NA	30	0.02	0.08	1.80	0.02	1.24	8.19	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	135	NA	25	0.01	0.76	0.06	0.00	1.28	9.74	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	135	NA	25	0.09	0.74	0.63	0.01	1.36	9.78	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	25	0.09	0.74	0.63	0.01	1.36	9.78	775.74
Hydro Seed Truck	Heavy-duty Diesel	NA	NA	1	20	NA	60	0.02	0.08	1.80	0.02	3.14	27.36	1,659.19
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	135	5	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	3	135	8	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
Helicopter[b]	UH-60 Blackhawk	NA	NA	3	22	5	NA	554.33	724.90	575.30	438.00	8.55	8.35	234,198.12
Water Truck[n]	Heavy-duty Diesel	NA	NA	1	22	NA	10	0.02	0.08	1.80	0.02	13.39	130.38	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	0.01	0.64	0.04	0.00	2.71	24.21	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.01	0.64	0.04	0.00	2.71	24.21	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.01	0.64	0.04	0.00	2.71	24.21	266.53
Transition Structures Estates/Park - South of Park (C3/C4)														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.01	0.76	0.06	0.00	0.32	0.08	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Transition Structures Estates/Park - North of Park (C1/C2)														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.01	0.76	0.06	0.00	0.32	0.08	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Riser Structures at Oakland X														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	20	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	20	NA	25	0.01	0.76	0.06	0.00	0.32	0.08	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	20	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	20	5	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	1	20	8	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	20	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	20	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.05	3.80	0.25	0.02	16.16	144.12
Worker Commutes	Light-duty Truck	NA	NA	2	135	NA	10	0.06	4.55	0.35	0.02	16.16	144.13
Structures Replacement (Poles and Towers)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	135	NA	30	0.43	2.03	48.25	0.40	33.20	219.36
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	135	NA	25	0.16	11.37	0.88	0.05	18.99	144.96
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	135	NA	25	1.27	10.99	9.39	0.11	20.28	145.54
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	25	1.27	10.99	9.39	0.11	20.28	145.54
Hydro Seed Truck	Heavy-duty Diesel	NA	NA	1	20	NA	60	0.04	0.20	4.77	0.04	8.30	72.37
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	135	5	NA	62.72	518.53	581.88	1.58	23.76	21.86
100 - 280 Ton Crane	Cranes	367	0.29	3	135	8	NA	150.52	1,244.47	1,396.51	3.80	57.02	52.45
Helicopter[b]	UH-60 Blackhawk	NA	NA	3	22	5	NA	341.98	425.58	1,400.51	802.30	3.09	3.01
Water Truck[n]	Heavy-duty Diesel	NA	NA	1	22	NA	10	0.01	0.04	0.87	0.01	6.50	63.24
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	0.07	5.70	0.37	0.02	24.23	216.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.05	3.80	0.25	0.02	16.16	144.12
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.05	3.80	0.25	0.02	16.16	144.12
Transition Structures Estates/Park - South of Park (C3/C4)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0.03	0.15	3.57	0.03	0.87	0.27
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.01	0.84	0.07	0.00	0.35	0.09
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.81	0.70	0.01	0.44	0.13
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.81	0.70	0.01	0.44	0.13
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	2.32	19.20	21.55	0.06	0.88	0.81
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	3.72	30.73	34.48	0.09	1.41	1.30
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.01	0.42	0.03	0.00	0.21	0.05
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.00	0.28	0.02	0.00	0.14	0.04
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.00	0.34	0.03	0.00	0.14	0.04
Transition Structures Estates/Park - North of Park (C1/C2)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0.03	0.15	3.57	0.03	0.87	0.27
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.01	0.84	0.07	0.00	0.35	0.09
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.81	0.70	0.01	0.44	0.13
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.81	0.70	0.01	0.44	0.13
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	2.32	19.20	21.55	0.06	0.88	0.81
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	3.72	30.73	34.48	0.09	1.41	1.30
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.01	0.42	0.03	0.00	0.21	0.05
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.00	0.28	0.02	0.00	0.14	0.04
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.00	0.34	0.03	0.00	0.14	0.04
Riser Structures at Oakland X													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	20	NA	30	0.06	0.30	7.15	0.06	1.75	0.54
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	20	NA	25	0.02	1.69	0.13	0.01	0.70	0.18
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	20	NA	25	0.19	1.63	1.39	0.02	0.89	0.26
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	25	0.19	1.63	1.39	0.02	0.89	0.26
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	20	5	NA	4.65	38.41	43.10	0.12	1.76	1.62
100 - 280 Ton Crane	Cranes	367	0.29	1	20	8	NA	7.43	61.46	68.96	0.19	2.82	2.59
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	20	NA	10	0.01	0.84	0.05	0.00	0.42	0.11
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	20	NA	10	0.01	0.56	0.04	0.00	0.28	0.07

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[l]				
								CO_2e	2026	2027	2028	2029	2030
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.72	0.14	0.86	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	135	NA	10	0.87	0.14	0.86	0	0	0
Structures Replacement (Poles and Towers)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	135	NA	30	20.16	0.14	0.86	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	135	NA	25	2.17	0.14	0.86	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	135	NA	25	5.24	0.14	0.86	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	25	5.24	0.14	0.86	0	0	0
Hydro Seed Truck	Heavy-duty Diesel	NA	NA	1	20	NA	60	1.99	0.14	0.86	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	135	5	NA	76.03	0.14	0.86	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	3	135	8	NA	182.48	0.14	0.86	0	0	0
Helicopter[b]	UH-60 Blackhawk	NA	NA	3	22	5	NA	194.59	0.14	0.86	0	0	0
Water Truck[n]	Heavy-duty Diesel	NA	NA	1	22	NA	10	0.37	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	1.08	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.72	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.72	0.14	0.86	0	0	0
Transition Structures Estates/Park - South of Park (C3/C4)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	1.49	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.16	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.39	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.39	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	2.82	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	4.51	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.08	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.05	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.06	0	1	0	0	0
Transition Structures Estates/Park - North of Park (C1/C2)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	1.49	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.16	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.39	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.39	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	2.82	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	4.51	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.08	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.05	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.06	0	1	0	0	0
Riser Structures at Oakland X													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	20	NA	30	2.99	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	20	NA	25	0.32	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	20	NA	25	0.78	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	25	0.78	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	20	5	NA	5.63	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	20	8	NA	9.01	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	20	NA	10	0.16	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	20	NA	10	0.11	0	1	0	0	0

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030
Worker Commutes	Light-duty Truck	NA	NA	2	20	NA	10	0	1	0	0	0
Conductor Replacement												
Line Puller	Other Construction Equipment	82	0.42	2	133	8	NA	0	4	3	0	0
Trailer-Mounted Tensioner	Other Construction Equipment	82	0.42	2	133	8	NA	0	4	3	0	0
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	4	133	7	NA	0	4	3	0	0
Transport of 55-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	4	133	NA	20	0	4	3	0	0
105-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	0	4	3	0	0
Transport of 105-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0	4	3	0	0
120-foot Crane Truck{f][f]	Off-Highway Trucks	376	0.38	2	133	7	NA	0	4	3	0	0
Transport of 120-foot Crane Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0	4	3	0	0
10,000 Pound Capacity Forklift	Forklifts	82	0.20	1	133	7	NA	0	4	3	0	0
Transport of 10,000 Pound Capacity Forklift[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0	4	3	0	0
Generator	Generator Sets	14	0.74	2	133	7	NA	0	4	3	0	0
Transport of Generator [j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0	4	3	0	0
Tractor Trailer (40-foot flatbed) [f]	Off-Highway Trucks	376	0.38	1	133	5	NA	0	4	3	0	0
Transport of Tractor Trailer (40-foot flatbed)[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0	4	3	0	0
Light Ship Helicopter[b]	MD500	NA	NA	3	32	6	NA	0	4	3	0	0
Medium-sized Ship Helicopter[b]	407 Long Ranger/Jet	NA	NA	3	32	6	NA	0	4	3	0	0
Water Truck[n]	Heavy-duty Diesel	NA	NA	1	32	NA	10	0	4	3	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	10	133	NA	50	0	4	3	0	0
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	133	NA	50	0	4	3	0	0
Worker Commutes	Light-duty Truck	NA	NA	10	133	NA	50	0	4	3	0	0
Truck - Light Duty Pickup	Light-duty Truck	NA	NA	8	133	NA	30	0	4	3	0	0
Crew Cab Heavy Duty Pickup	Heavy-duty Diesel	NA	NA	6	133	NA	30	0	4	3	0	0
Restoration (including SWPPP inspections)												
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	20	NA	60	0	0	9	12	3
Crew Trucks	Light-duty Truck	NA	NA	2	20	NA	60	0	0	9	12	3
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0	0	9	12	3
Worker Commutes - Dry Weather Monthly Insp.	Light-duty Truck	NA	NA	1	6	NA	60	0	0	9	12	3
Worker Commutes - Wet Weather Monthly Insp.	Light-duty Truck	NA	NA	1	26	NA	60	0	0	9	12	3

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment, g/mile for vehicles, and g/LTO for helicopters)[k]						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Worker Commutes	Light-duty Truck	NA	NA	2	20	NA	10	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Conductor Replacement														
Line Puller	Other Construction Equipment	82	0.42	2	133	8	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
Trailer-Mounted Tensioner	Other Construction Equipment	82	0.42	2	133	8	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	4	133	7	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
Transport of 55-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	4	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
105-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
Transport of 105-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
120-foot Crane Truck{f][f]	Off-Highway Trucks	376	0.38	2	133	7	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
Transport of 120-foot Crane Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
10,000 Pound Capacity Forklift	Forklifts	82	0.20	1	133	7	NA	0.25	3.58	2.34	0.01	0.11	0.10	528.81
Transport of 10,000 Pound Capacity Forklift[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Generator	Generator Sets	14	0.74	2	133	7	NA	0.54	2.86	4.32	0.01	0.17	0.16	570.39
Transport of Generator [j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Tractor Trailer (40-foot flatbed) [f]	Off-Highway Trucks	376	0.38	1	133	5	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
Transport of Tractor Trailer (40-foot flatbed)[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Light Ship Helicopter[b]	MD500	NA	NA	3	32	6	NA	344.44	457.70	85.10	114.60	1.52	1.48	61,276.50
Medium-sized Ship Helicopter[b]	407 Long Ranger/Jet	NA	NA	3	32	6	NA	278.13	365.50	130.50	141.60	2.13	2.07	75,713.37
Water Truck[n]	Heavy-duty Diesel	NA	NA	1	32	NA	10	0.02	0.08	1.80	0.02	6.92	65.26	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	10	133	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	133	NA	50	0.02	0.10	1.02	0.01	0.37	0.10	1,189.11
Worker Commutes	Light-duty Truck	NA	NA	10	133	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Truck - Light Duty Pickup	Light-duty Truck	NA	NA	8	133	NA	30	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Crew Cab Heavy Duty Pickup	Heavy-duty Diesel	NA	NA	6	133	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Restoration (including SWPPP inspections)														
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	20	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Crew Trucks	Light-duty Truck	NA	NA	2	20	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes - Dry Weather Monthly Insp.	Light-duty Truck	NA	NA	1	6	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Worker Commutes - Wet Weather Monthly Insp.	Light-duty Truck	NA	NA	1	26	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
Worker Commutes	Light-duty Truck	NA	NA	2	20	NA	10	0.01	0.67	0.05	0.00	0.28	0.07
Conductor Replacement													
Line Puller	Other Construction Equipment	82	0.42	2	133	8	NA	45.56	566.14	441.73	0.81	25.53	23.43
Trailer-Mounted Tensioner	Other Construction Equipment	82	0.42	2	133	8	NA	45.56	566.14	441.73	0.81	25.53	23.43
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	4	133	7	NA	206.45	1,381.83	1,185.93	5.87	42.23	38.71
Transport of 55-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	4	133	NA	20	0.38	1.78	42.25	0.35	10.31	3.21
105-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	103.23	690.91	592.97	2.93	21.11	19.35
Transport of 105-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.19	0.89	21.13	0.18	5.16	1.60
120-foot Crane Truck{f][f]	Off-Highway Trucks	376	0.38	2	133	7	NA	103.23	690.91	592.97	2.93	21.11	19.35
Transport of 120-foot Crane Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.19	0.89	21.13	0.18	5.16	1.60
10,000 Pound Capacity Forklift	Forklifts	82	0.20	1	133	7	NA	8.28	120.47	78.83	0.17	3.77	3.47
Transport of 10,000 Pound Capacity Forklift[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0.09	0.45	10.56	0.09	2.58	0.80
Generator	Generator Sets	14	0.74	2	133	7	NA	22.92	121.63	183.89	0.34	7.40	6.80
Transport of Generator [j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.19	0.89	21.13	0.18	5.16	1.60
Tractor Trailer (40-foot flatbed) [f]	Off-Highway Trucks	376	0.38	1	133	5	NA	36.87	246.75	211.77	1.05	7.54	6.91
Transport of Tractor Trailer (40-foot flatbed)[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0.09	0.45	10.56	0.09	2.58	0.80
Light Ship Helicopter[b]	MD500	NA	NA	3	32	6	NA	389.31	503.22	314.31	320.63	4.95	4.83
Medium-sized Ship Helicopter[b]	407 Long Ranger/Jet	NA	NA	3	32	6	NA	330.07	424.44	497.46	409.40	7.30	7.13
Water Truck[n]	Heavy-duty Diesel	NA	NA	1	32	NA	10	0.01	0.05	1.27	0.01	4.88	46.04
Worker Commutes	Light-duty Auto/Truck	NA	NA	10	133	NA	50	1.15	93.63	6.06	0.38	46.23	11.78
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	133	NA	50	2.74	11.34	120.09	1.26	43.04	12.18
Worker Commutes	Light-duty Truck	NA	NA	10	133	NA	50	1.53	112.05	8.70	0.46	46.40	11.86
Truck - Light Duty Pickup	Light-duty Truck	NA	NA	8	133	NA	30	0.73	53.79	4.17	0.22	22.27	5.69
Crew Cab Heavy Duty Pickup	Heavy-duty Diesel	NA	NA	6	133	NA	30	0.85	4.01	95.06	0.79	23.21	7.22
Restoration (including SWPPP inspections)													
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	20	NA	60	0.04	0.20	4.77	0.04	1.16	0.36
Crew Trucks	Light-duty Truck	NA	NA	2	20	NA	60	0.06	4.04	0.31	0.02	1.67	0.43
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0.05	0.24	5.72	0.05	1.40	0.43
Worker Commutes - Dry Weather Monthly Insp.	Light-duty Truck	NA	NA	1	6	NA	60	0.01	0.61	0.05	0.00	0.25	0.06
Worker Commutes - Wet Weather Monthly Insp.	Light-duty Truck	NA	NA	1	26	NA	60	0.04	2.63	0.20	0.01	1.09	0.28

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[l]				
								CO_2e	2026	2027	2028	2029	2030
Worker Commutes	Light-duty Truck	NA	NA	2	20	NA	10	0.13	0	1	0	0	0
Conductor Replacement													
Line Puller	Other Construction Equipment	82	0.42	2	133	8	NA	38.79	0	0.57	0.43	0	0
Trailer-Mounted Tensioner	Other Construction Equipment	82	0.42	2	133	8	NA	38.79	0	0.57	0.43	0	0
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	4	133	7	NA	282.48	0	0.57	0.43	0	0
Transport of 55-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	4	133	NA	20	17.65	0	0.57	0.43	0	0
105-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	141.24	0	0.57	0.43	0	0
Transport of 105-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	8.83	0	0.57	0.43	0	0
120-foot Crane Truck{f][f]	Off-Highway Trucks	376	0.38	2	133	7	NA	141.24	0	0.57	0.43	0	0
Transport of 120-foot Crane Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	8.83	0	0.57	0.43	0	0
10,000 Pound Capacity Forklift	Forklifts	82	0.20	1	133	7	NA	8.07	0	0.57	0.43	0	0
Transport of 10,000 Pound Capacity Forklift[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	4.41	0	0.57	0.43	0	0
Generator	Generator Sets	14	0.74	2	133	7	NA	11.00	0	0.57	0.43	0	0
Transport of Generator [j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	8.83	0	0.57	0.43	0	0
Tractor Trailer (40-foot flatbed) [f]	Off-Highway Trucks	376	0.38	1	133	5	NA	50.44	0	0.57	0.43	0	0
Transport of Tractor Trailer (40-foot flatbed)[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	4.41	0	0.57	0.43	0	0
Light Ship Helicopter[b]	MD500	NA	NA	3	32	6	NA	77.77	0	0.57	0.43	0	0
Medium-sized Ship Helicopter[b]	407 Long Ranger/Jet	NA	NA	3	32	6	NA	99.29	0	0.57	0.43	0	0
Water Truck[n]	Heavy-duty Diesel	NA	NA	1	32	NA	10	0.53	0	0.57	0.43	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	10	133	NA	50	17.72	0	0.57	0.43	0	0
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	133	NA	50	63.26	0	0.57	0.43	0	0
Worker Commutes	Light-duty Truck	NA	NA	10	133	NA	50	21.36	0	0.57	0.43	0	0
Truck - Light Duty Pickup	Light-duty Truck	NA	NA	8	133	NA	30	10.25	0	0.57	0.43	0	0
Crew Cab Heavy Duty Pickup	Heavy-duty Diesel	NA	NA	6	133	NA	30	39.72	0	0.57	0.43	0	0
Restoration (including SWPPP inspections)													
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	20	NA	60	1.99	0	0	0.38	0.5	0.13
Crew Trucks	Light-duty Truck	NA	NA	2	20	NA	60	0.77	0	0	0.38	0.5	0.13
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	2.39	0	0	0.38	0.5	0.13
Worker Commutes - Dry Weather Monthly Insp.	Light-duty Truck	NA	NA	1	6	NA	60	0.12	0	0	0.38	0.5	0.13
Worker Commutes - Wet Weather Monthly Insp.	Light-duty Truck	NA	NA	1	26	NA	60	0.50	0	0	0.38	0.5	0.13

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] Hours per Day data provided for the helicopters should represent hours of operation per day for the helicopter. Quantity per day for the helicopters represents the number of LTO cycles per day. It was assumed that one of each type of helicopter would be sufficient for completing construction activities.

[c] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 ton =	2,000	lbs
1 metric ton =	1,000,000	g

[d] PM_{10} and $PM_{2.5}$ emissions include paved and unpaved road fugitive dust emissions associated with onroad and offroad travel, respectively, as follows:

- For Phase 1-2, each truck is expected to travel on unpaved roads for up to:	2	miles per day.		
- For Phase 1-4, each commute truck, dump truck, 4x4, and lowboy truck is expected to travel on unpaved roads for up to:	2	miles per day for	25	days.
- For Phase 1-5, each truck is expected to travel on unpaved roads for up to:	2	miles per day for	25	days (or the entire duration if used for less than 25 days).
- For Phase 1-9, the water truck is expected to travel on unpaved roads for up to:	1	mile per day.		

[e] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] Based on the usage data provided, this vehicle was treated as a construction equipment which will primarily remain onsite.

[g] Light-duty trucks with a power rating > 300 hp were conservatively treated as medium-duty trucks.

[h] Based on the equipment/vehicle type, this equipment/vehicle was assumed to be construction equipment which will primarily remain onsite and operate 8 hours per day.

[i] A number of vehicles and equipment will be used for only a portion of the total duration for each phase.

[j] These equipment will be transported to/from the site each day, with a one-way trip length of 10 miles.

[k] Emission factors associated with hourly operation of the helicopters are provided in Appendix A, Table 15 and are factored into the emissions calculations presented herein.

[l] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[m] Fugitive Dust emissions from Grading activities are a result of smoothing unpaved access roads and were estimated per the details provided below.

[n] One water truck conservatively added to each phase in which helicopters are used to minimize potential dust associated with the helicopter landing zones. It was assumed that each water truck would be used for the same number of days as the helicopters for up to 10 miles per day.

NA = Parameter not required for computing emissions.

Fugitive Dust emissions from Grading

Activity	Year	Area Graded (acres/ phase)[a]	Grader VMT (miles/ phase)[b]	Emission Factors (lb/mile)		Emissions (lb/phase)	
				PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Grading	2026	2.60	1.78	1.543	0.167	2.8	0.3
Grading	2027	0.00	0.00	1.543	0.167	0.0	0.0
Grading	2028	0.00	0.00	1.543	0.167	0.0	0.0
Grading	2029	0.00	0.00	1.543	0.167	0.0	0.0
Grading	2030	0.00	0.00	1.543	0.167	0.0	0.0

[a] Total area to be graded is as follows, based on the length of access roads to be improved and an assumed roadway width of 20 feet: 2.60 acres.

[b] Vehicle miles traveled by graders estimated as follows, per methodology provided in Section 4.4.1 of Appendix C of the *CalEEMod User's Guide* (ICF 2022):

VMT (mile/phase) = Area Graded (acres/phase) / Wb (ft) X 43,560 (ft^2/acre) / 5,280 (ft/mile), where

Wb is the blade width of the grader; the CalEEMod default for Wb is = 12 ft.

Table A5.3-4. Phase/Activity #1 - Emissions for Rebuild Lines Overhead and Remove Existing East of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030

Annual Emissions Summary

Year[a]	Emissions (lbs/year)						Emissions (metric tons/ year)
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
2026	457	3,286	714	117	144	872	133
2027	1,301	6,040	6,554	1,125	597	2,044	1,214
2028	557	2,400	2,106	321	166	111	471
2029	0.10	3.86	5.52	0.06	2.79	0.78	2.88
2030	0.02	0.97	1.38	0.01	0.70	0.20	0.72

[a] Yearly emissions were estimated using a weight factor based on the schedule and months of activity per year.

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of Estates Dr[n]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030
ROW Clearing (vegetation, tree trimming)												
10-Cu Dump Truck (remove green waste)	Heavy-duty Diesel	NA	NA	3	30	NA	60	2	0	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	5	30	NA	60	2	0	0	0	0
Chain Saws	Chainsaws	1.86	0.70	10	30	4	NA	2	0	0	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	5	30	4	NA	2	0	0	0	0
Blowers	Leaf Blowers/Vacuums	1.79	0.94	5	30	4	NA	2	0	0	0	0
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	5	30	4	NA	2	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	30	NA	60	2	0	0	0	0
Roads and Access: Construction Areas, Pulling Sites, Light Road Improvements for 3 of 12 miles												
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	10	NA	45	1	0	0	0	0
4,000 Gallon Water Truck	Medium-duty Diesel	NA	NA	2	25	NA	50	1	0	0	0	0
¾-Ton Pick-up Truck, 4 × 4 (stand by fire crew)	Heavy-duty Truck	NA	NA	1	10	NA	30	1	0	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	2	4	NA	30	1	0	0	0	0
Skid Steer	Skid Steer Loaders	71	0.37	1	10	5	NA	1	0	0	0	0
325 Excavator	Excavators	36	0.38	1	10	5	NA	1	0	0	0	0
Skip Loader	Rubber Tired Loaders	150	0.36	1	15	5	NA	1	0	0	0	0
D6 Dozer	Tractors/Loaders/Backhoes	84	0.37	1	10	5	NA	1	0	0	0	0
Fugitive Dust	Grading	NA	NA	[m]	25	NA	NA	1	0	0	0	0
Worker Commutes (3/4-ton pick-up)	Heavy-duty Truck	NA	NA	4	25	NA	50	1	0	0	0	0
Light Duty Truck (inspectors)	Light-duty Auto/Truck	NA	NA	1	12	NA	50	1	0	0	0	0
Guard Structures												
Digger Derrick Line Truck	Heavy-duty Diesel	NA	NA	2	47	NA	30	1	6	0	0	0
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	1	47	8	NA	1	6	0	0	0
20,000 Pound Capacity Forklift	Forklifts	82	0.20	1	47	8	NA	1	6	0	0	0
Super Framer 10 Wheel Flat Bed	Heavy-duty Diesel	NA	NA	1	47	NA	1	1	6	0	0	0
Heavy-Duty Vac Truck	Heavy-duty Diesel	NA	NA	2	47	NA	1	1	6	0	0	0
Generator	Generator Sets	14	0.74	1	47	8	NA	1	6	0	0	0
Flasher Board for Traffic Control	Signal Boards	6	0.82	2	47	8	NA	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	47	NA	50	1	6	0	0	0
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	47	NA	50	1	6	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	4	47	NA	50	1	6	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	6	47	NA	30	1	6	0	0	0
1-Ton Crew Cab Pickup	Heavy-duty Truck	NA	NA	4	47	NA	30	1	6	0	0	0
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)												
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	135	NA	45	1	6	0	0	0
Auger Truck[h]	Bore/Drill Rigs	83	0.50	1	15	8	NA	1	6	0	0	0
10-Cu Concrete Mixer Truck	Heavy-duty Diesel	NA	NA	2	15	NA	75	1	6	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	30	1	6	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	135	NA	30	1	6	0	0	0
Skid Steer/Front Loader[h]	Skid Steer Loaders	71	0.37	1	135	8	NA	1	6	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	1	135	NA	15	1	6	0	0	0
Backhoe/Front Loader	Tractors/Loaders/Backhoes	84	0.37	1	135	8	NA	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	1	6	0	0	0

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of E

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment, g/mile for vehicles, and g/LTO for helicopters)[k]						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
ROW Clearing (vegetation, tree trimming)														
10-Cu Dump Truck (remove green waste)	Heavy-duty Diesel	NA	NA	3	30	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Boom Truck	Heavy-duty Diesel	NA	NA	5	30	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Chain Saws	Chainsaws	1.86	0.70	10	30	4	NA	47.48	128.98	1.45	0.01	0.41	0.55	694.41
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	5	30	4	NA	15.90	278.24	2.11	0.01	0.01	0.01	647.75
Blowers	Leaf Blowers/Vacuums	1.79	0.94	5	30	4	NA	40.08	135.48	0.64	0.01	0.44	0.58	908.57
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	5	30	4	NA	14.81	304.46	4.86	0.01	0.08	0.10	812.30
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	30	NA	60	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Roads and Access: Construction Areas, Pulling Sites, Light Road Improvements for 3 of 12 miles														
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	10	NA	45	0.02	0.08	1.80	0.02	1.73	13.16	1,659.19
4,000 Gallon Water Truck	Medium-duty Diesel	NA	NA	2	25	NA	50	0.02	0.10	1.02	0.01	1.53	11.82	1,189.11
¾-Ton Pick-up Truck, 4 × 4 (stand by fire crew)	Heavy-duty Truck	NA	NA	1	10	NA	30	0.09	0.74	0.63	0.01	2.34	19.65	775.74
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	2	4	NA	30	0.02	0.08	1.80	0.02	2.37	19.67	1,659.19
Skid Steer	Skid Steer Loaders	71	0.37	1	10	5	NA	0.13	3.25	1.81	0.01	0.05	0.05	530.34
325 Excavator	Excavators	36	0.38	1	10	5	NA	0.39	4.22	3.41	0.01	0.10	0.09	589.12
Skip Loader	Rubber Tired Loaders	150	0.36	1	15	5	NA	0.21	3.29	1.40	0.01	0.07	0.07	528.13
D6 Dozer	Tractors/Loaders/Backhoes	84	0.37	1	10	5	NA	0.18	3.48	0.26	0.01	0.06	0.06	531.42
Fugitive Dust	Grading	NA	NA	[m]	25	NA	NA	--	--	--	--	0.69	0.07	--
Worker Commutes (3/4-ton pick-up)	Heavy-duty Truck	NA	NA	4	25	NA	50	0.09	0.74	0.63	0.01	1.56	11.84	775.74
Light Duty Truck (inspectors)	Light-duty Auto/Truck	NA	NA	1	12	NA	50	0.01	0.64	0.04	0.00	1.47	11.80	266.53
Guard Structures														
Digger Derrick Line Truck	Heavy-duty Diesel	NA	NA	2	47	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	1	47	8	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
20,000 Pound Capacity Forklift	Forklifts	82	0.20	1	47	8	NA	0.25	3.58	2.34	0.01	0.11	0.10	528.81
Super Framer 10 Wheel Flat Bed	Heavy-duty Diesel	NA	NA	1	47	NA	1	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Heavy-Duty Vac Truck	Heavy-duty Diesel	NA	NA	2	47	NA	1	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Generator	Generator Sets	14	0.74	1	47	8	NA	0.54	2.86	4.32	0.01	0.17	0.16	570.39
Flasher Board for Traffic Control	Signal Boards	6	0.82	2	47	8	NA	0.55	3.47	4.14	0.01	0.16	0.15	570.37
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	47	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	47	NA	50	0.02	0.10	1.02	0.01	0.37	0.10	1,189.11
Worker Commutes	Light-duty Truck	NA	NA	4	47	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	6	47	NA	30	0.09	0.74	0.63	0.01	0.40	0.12	775.74
1-Ton Crew Cab Pickup	Heavy-duty Truck	NA	NA	4	47	NA	30	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)														
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	135	NA	45	0.02	0.08	1.80	0.02	0.68	2.55	1,659.19
Auger Truck[h]	Bore/Drill Rigs	83	0.50	1	15	8	NA	0.13	3.25	1.64	0.01	0.04	0.04	531.52
10-Cu Concrete Mixer Truck	Heavy-duty Diesel	NA	NA	2	15	NA	75	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	30	0.09	0.74	0.63	0.01	0.76	3.74	775.74
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	135	NA	30	0.02	0.08	1.80	0.02	0.80	3.75	1,659.19
Skid Steer/Front Loader[h]	Skid Steer Loaders	71	0.37	1	135	8	NA	0.13	3.25	1.81	0.01	0.05	0.05	530.34
Boom Truck	Heavy-duty Diesel	NA	NA	1	135	NA	15	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Backhoe/Front Loader	Tractors/Loaders/Backhoes	84	0.37	1	135	8	NA	0.18	3.48	0.26	0.01	0.06	0.06	531.42
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	0.01	0.64	0.04	0.00	1.39	10.93	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.01	0.64	0.04	0.00	1.39	10.93	266.53

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of E

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
ROW Clearing (vegetation, tree trimming)													
10-Cu Dump Truck (remove green waste)	Heavy-duty Diesel	NA	NA	3	30	NA	60	0.19	0.90	21.44	0.18	5.24	1.63
Boom Truck	Heavy-duty Diesel	NA	NA	5	30	NA	60	0.32	1.51	35.74	0.30	8.73	2.71
Chain Saws	Chainsaws	1.86	0.70	10	30	4	NA	163.54	444.26	4.99	0.03	1.41	1.89
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	5	30	4	NA	79.56	1,392.30	10.56	0.05	0.05	0.05
Blowers	Leaf Blowers/Vacuums	1.79	0.94	5	30	4	NA	89.20	301.53	1.42	0.02	0.98	1.29
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	5	30	4	NA	31.02	637.67	10.18	0.02	0.17	0.21
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	30	NA	60	0.03	2.53	0.16	0.01	1.25	0.32
Roads and Access: Construction Areas, Pulling Sites, Light Road Improvements for 3 of 12 miles													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	10	NA	45	0.02	0.08	1.79	0.01	1.71	13.06
4,000 Gallon Water Truck	Medium-duty Diesel	NA	NA	2	25	NA	50	0.13	0.53	5.64	0.06	8.41	65.17
¾-Ton Pick-up Truck, 4 × 4 (stand by fire crew)	Heavy-duty Truck	NA	NA	1	10	NA	30	0.06	0.49	0.42	0.00	1.54	13.00
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	2	4	NA	30	0.01	0.04	0.95	0.01	1.25	10.41
Skid Steer	Skid Steer Loaders	71	0.37	1	10	5	NA	0.39	9.40	5.23	0.01	0.15	0.14
325 Excavator	Excavators	36	0.38	1	10	5	NA	0.59	6.37	5.14	0.01	0.15	0.14
Skip Loader	Rubber Tired Loaders	150	0.36	1	15	5	NA	1.88	29.40	12.48	0.04	0.65	0.60
D6 Dozer	Tractors/Loaders/Backhoes	84	0.37	1	10	5	NA	0.63	11.93	0.89	0.02	0.22	0.20
Fugitive Dust	Grading	NA	NA	[m]	25	NA	NA	--	--	--	--	1.24	0.13
Worker Commutes (3/4-ton pick-up)	Heavy-duty Truck	NA	NA	4	25	NA	50	0.94	8.14	6.96	0.08	17.23	130.51
Light Duty Truck (inspectors)	Light-duty Auto/Truck	NA	NA	1	12	NA	50	0.01	0.84	0.05	0.00	1.95	15.61
Guard Structures													
Digger Derrick Line Truck	Heavy-duty Diesel	NA	NA	2	47	NA	30	0.10	0.47	11.20	0.09	2.73	0.85
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	1	47	8	NA	20.84	139.52	30.79	0.59	4.26	3.91
20,000 Pound Capacity Forklift	Forklifts	82	0.20	1	47	8	NA	3.34	48.65	31.84	0.07	1.52	1.40
Super Framer 10 Wheel Flat Bed	Heavy-duty Diesel	NA	NA	1	47	NA	1	0.00	0.01	0.19	0.00	0.05	0.01
Heavy-Duty Vac Truck	Heavy-duty Diesel	NA	NA	2	47	NA	1	0.00	0.02	0.37	0.00	0.09	0.03
Generator	Generator Sets	14	0.74	1	47	8	NA	4.63	24.56	37.13	0.07	1.49	1.37
Flasher Board for Traffic Control	Signal Boards	6	0.82	2	47	8	NA	4.46	28.30	33.79	0.07	1.32	1.22
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	47	NA	50	0.24	19.85	1.29	0.08	9.80	2.50
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	47	NA	50	0.97	4.01	42.44	0.45	15.21	4.31
Worker Commutes	Light-duty Truck	NA	NA	4	47	NA	50	0.22	15.84	1.23	0.07	6.56	1.68
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	6	47	NA	30	1.59	13.77	11.77	0.14	7.53	2.23
1-Ton Crew Cab Pickup	Heavy-duty Truck	NA	NA	4	47	NA	30	1.06	9.18	7.85	0.09	5.02	1.49
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	135	NA	45	0.22	1.02	24.12	0.20	9.08	34.13
Auger Truck[h]	Bore/Drill Rigs	83	0.50	1	15	8	NA	1.41	35.71	17.99	0.05	0.44	0.41
10-Cu Concrete Mixer Truck	Heavy-duty Diesel	NA	NA	2	15	NA	75	0.08	0.38	8.93	0.07	2.18	0.68
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	30	1.53	13.18	11.27	0.13	13.59	66.73
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	135	NA	30	0.14	0.68	16.08	0.13	7.12	33.52
Skid Steer/Front Loader[h]	Skid Steer Loaders	71	0.37	1	135	8	NA	8.38	202.97	113.02	0.31	3.19	2.94
Boom Truck	Heavy-duty Diesel	NA	NA	1	135	NA	15	0.07	0.34	8.04	0.07	1.96	0.61
Backhoe/Front Loader	Tractors/Loaders/Backhoes	84	0.37	1	135	8	NA	13.62	257.59	19.24	0.37	4.66	4.29
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	0.07	5.70	0.37	0.02	12.40	97.61
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.05	3.80	0.25	0.02	8.27	65.08

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of E

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[l]				
								CO_2e	2026	2027	2028	2029	2030
ROW Clearing (vegetation, tree trimming)													
10-Cu Dump Truck (remove green waste)	Heavy-duty Diesel	NA	NA	3	30	NA	60	8.96	1	0	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	5	30	NA	60	14.93	1	0	0	0	0
Chain Saws	Chainsaws	1.86	0.70	10	30	4	NA	1.08	1	0	0	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	5	30	4	NA	1.47	1	0	0	0	0
Blowers	Leaf Blowers/Vacuums	1.79	0.94	5	30	4	NA	0.92	1	0	0	0	0
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	5	30	4	NA	0.77	1	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	30	NA	60	0.48	1	0	0	0	0
Roads and Access: Construction Areas, Pulling Sites, Light Road Improvements for 3 of 12 miles													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	10	NA	45	0.75	1	0	0	0	0
4,000 Gallon Water Truck	Medium-duty Diesel	NA	NA	2	25	NA	50	2.97	1	0	0	0	0
¾-Ton Pick-up Truck, 4 × 4 (stand by fire crew)	Heavy-duty Truck	NA	NA	1	10	NA	30	0.23	1	0	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	2	4	NA	30	0.40	1	0	0	0	0
Skid Steer	Skid Steer Loaders	71	0.37	1	10	5	NA	0.70	1	0	0	0	0
325 Excavator	Excavators	36	0.38	1	10	5	NA	0.40	1	0	0	0	0
Skip Loader	Rubber Tired Loaders	150	0.36	1	15	5	NA	2.14	1	0	0	0	0
D6 Dozer	Tractors/Loaders/Backhoes	84	0.37	1	10	5	NA	0.83	1	0	0	0	0
Fugitive Dust	Grading	NA	NA	[m]	25	NA	NA	--	1	0	0	0	0
Worker Commutes (3/4-ton pick-up)	Heavy-duty Truck	NA	NA	4	25	NA	50	3.88	1	0	0	0	0
Light Duty Truck (inspectors)	Light-duty Auto/Truck	NA	NA	1	12	NA	50	0.16	1	0	0	0	0
Guard Structures													
Digger Derrick Line Truck	Heavy-duty Diesel	NA	NA	2	47	NA	30	4.68	0.14	0.86	0	0	0
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	1	47	8	NA	28.52	0.14	0.86	0	0	0
20,000 Pound Capacity Forklift	Forklifts	82	0.20	1	47	8	NA	3.26	0.14	0.86	0	0	0
Super Framer 10 Wheel Flat Bed	Heavy-duty Diesel	NA	NA	1	47	NA	1	0.08	0.14	0.86	0	0	0
Heavy-Duty Vac Truck	Heavy-duty Diesel	NA	NA	2	47	NA	1	0.16	0.14	0.86	0	0	0
Generator	Generator Sets	14	0.74	1	47	8	NA	2.22	0.14	0.86	0	0	0
Flasher Board for Traffic Control	Signal Boards	6	0.82	2	47	8	NA	2.11	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	47	NA	50	3.76	0.14	0.86	0	0	0
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	47	NA	50	22.36	0.14	0.86	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	4	47	NA	50	3.02	0.14	0.86	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	6	47	NA	30	6.56	0.14	0.86	0	0	0
1-Ton Crew Cab Pickup	Heavy-duty Truck	NA	NA	4	47	NA	30	4.38	0.14	0.86	0	0	0
Foundations (Hole Digging, Foundation Setup/Cage, Pour Concrete, Finish/Removal of set up) and Removal of Foundations (East of CC)													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	135	NA	45	10.08	0.14	0.86	0	0	0
Auger Truck[h]	Bore/Drill Rigs	83	0.50	1	15	8	NA	2.65	0.14	0.86	0	0	0
10-Cu Concrete Mixer Truck	Heavy-duty Diesel	NA	NA	2	15	NA	75	3.73	0.14	0.86	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	30	6.28	0.14	0.86	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	135	NA	30	6.72	0.14	0.86	0	0	0
Skid Steer/Front Loader[h]	Skid Steer Loaders	71	0.37	1	135	8	NA	15.05	0.14	0.86	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	1	135	NA	15	3.36	0.14	0.86	0	0	0
Backhoe/Front Loader	Tractors/Loaders/Backhoes	84	0.37	1	135	8	NA	17.84	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	1.08	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.72	0.14	0.86	0	0	0

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of Estates Dr[n]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030
Worker Commutes	Light-duty Truck	NA	NA	2	135	NA	10	1	6	0	0	0
Structures Replacement (Poles and Towers)												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	135	NA	30	1	6	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	135	NA	25	1	6	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	135	NA	25	1	6	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	25	1	6	0	0	0
Hydro Seed Truck	Heavy-duty Diesel	NA	NA	1	20	NA	60	1	6	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	135	5	NA	1	6	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	3	135	8	NA	1	6	0	0	0
Helicopter[b]	UH-60 Blackhawk	NA	NA	3	22	5	NA	1	6	0	0	0
Water Truck[o]	Heavy-duty Diesel	NA	NA	1	22	NA	10	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	1	6	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	1	6	0	0	0
Transition Structures Estates/Park - South of Park (C3/C4)												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0	1	0	0	0
Transition Structures Estates/Park - North of Park (C1/C2)												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0	1	0	0	0
Riser Structures at Oakland X												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	20	NA	30	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	20	NA	25	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	20	NA	25	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	25	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	20	5	NA	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	20	8	NA	0	1	0	0	0

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of E

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment, g/mile for vehicles, and g/LTO for helicopters)[k]						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Worker Commutes	Light-duty Truck	NA	NA	2	135	NA	10	0.01	0.76	0.06	0.00	1.39	10.93	321.14
Structures Replacement (Poles and Towers)														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	135	NA	30	0.02	0.08	1.80	0.02	0.80	3.75	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	135	NA	25	0.01	0.76	0.06	0.00	0.75	4.42	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	135	NA	25	0.09	0.74	0.63	0.01	0.83	4.46	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	25	0.09	0.74	0.63	0.01	0.83	4.46	775.74
Hydro Seed Truck	Heavy-duty Diesel	NA	NA	1	20	NA	60	0.02	0.08	1.80	0.02	1.65	12.35	1,659.19
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	135	5	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	3	135	8	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
Helicopter[b]	UH-60 Blackhawk	NA	NA	3	22	5	NA	554.33	724.90	575.30	438.00	8.55	8.35	234,198.12
Water Truck[o]	Heavy-duty Diesel	NA	NA	1	22	NA	10	0.02	0.08	1.80	0.02	6.24	58.74	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	0.01	0.64	0.04	0.00	1.39	10.93	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.01	0.64	0.04	0.00	1.39	10.93	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.01	0.64	0.04	0.00	1.39	10.93	266.53
Transition Structures Estates/Park - South of Park (C3/C4)														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.01	0.76	0.06	0.00	0.32	0.08	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Transition Structures Estates/Park - North of Park (C1/C2)														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.01	0.76	0.06	0.00	0.32	0.08	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Riser Structures at Oakland X														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	20	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	20	NA	25	0.01	0.76	0.06	0.00	0.32	0.08	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	20	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	20	5	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	1	20	8	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of E

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
Worker Commutes	Light-duty Truck	NA	NA	2	135	NA	10	0.06	4.55	0.35	0.02	8.27	65.08
Structures Replacement (Poles and Towers)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	135	NA	30	0.43	2.03	48.25	0.40	21.36	100.56
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	135	NA	25	0.16	11.37	0.88	0.05	11.10	65.80
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	135	NA	25	1.27	10.99	9.39	0.11	12.39	66.38
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	25	1.27	10.99	9.39	0.11	12.39	66.38
Hydro Seed Truck	Heavy-duty Diesel	NA	NA	1	20	NA	60	0.04	0.20	4.77	0.04	4.36	32.66
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	135	5	NA	62.72	518.53	82.36	1.58	23.76	21.86
100 - 280 Ton Crane	Cranes	367	0.29	3	135	8	NA	150.52	1,244.47	197.66	3.80	57.02	52.45
Helicopter[b]	UH-60 Blackhawk	NA	NA	3	22	5	NA	341.98	425.58	1,400.51	802.30	3.09	3.01
Water Truck[o]	Heavy-duty Diesel	NA	NA	1	22	NA	10	0.01	0.04	0.87	0.01	3.02	28.49
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	0.07	5.70	0.37	0.02	12.40	97.61
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.05	3.80	0.25	0.02	8.27	65.08
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.05	3.80	0.25	0.02	8.27	65.08
Transition Structures Estates/Park - South of Park (C3/C4)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0.03	0.15	3.57	0.03	0.87	0.27
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.01	0.84	0.07	0.00	0.35	0.09
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.81	0.70	0.01	0.44	0.13
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.81	0.70	0.01	0.44	0.13
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	2.32	19.20	3.05	0.06	0.88	0.81
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	3.72	30.73	4.88	0.09	1.41	1.30
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.01	0.42	0.03	0.00	0.21	0.05
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.00	0.28	0.02	0.00	0.14	0.04
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.00	0.34	0.03	0.00	0.14	0.04
Transition Structures Estates/Park - North of Park (C1/C2)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	0.03	0.15	3.57	0.03	0.87	0.27
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.01	0.84	0.07	0.00	0.35	0.09
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.81	0.70	0.01	0.44	0.13
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.09	0.81	0.70	0.01	0.44	0.13
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	2.32	19.20	3.05	0.06	0.88	0.81
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	3.72	30.73	4.88	0.09	1.41	1.30
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.01	0.42	0.03	0.00	0.21	0.05
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.00	0.28	0.02	0.00	0.14	0.04
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.00	0.34	0.03	0.00	0.14	0.04
Riser Structures at Oakland X													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	20	NA	30	0.06	0.30	7.15	0.06	1.75	0.54
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	20	NA	25	0.02	1.69	0.13	0.01	0.70	0.18
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	20	NA	25	0.19	1.63	1.39	0.02	0.89	0.26
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	25	0.19	1.63	1.39	0.02	0.89	0.26
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	20	5	NA	4.65	38.41	6.10	0.12	1.76	1.62
100 - 280 Ton Crane	Cranes	367	0.29	1	20	8	NA	7.43	61.46	9.76	0.19	2.82	2.59

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of E

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[l]				
								CO_2e	2026	2027	2028	2029	2030
Worker Commutes	Light-duty Truck	NA	NA	2	135	NA	10	0.87	0.14	0.86	0	0	0
Structures Replacement (Poles and Towers)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	135	NA	30	20.16	0.14	0.86	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	135	NA	25	2.17	0.14	0.86	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	135	NA	25	5.24	0.14	0.86	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	135	NA	25	5.24	0.14	0.86	0	0	0
Hydro Seed Truck	Heavy-duty Diesel	NA	NA	1	20	NA	60	1.99	0.14	0.86	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	135	5	NA	76.03	0.14	0.86	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	3	135	8	NA	182.48	0.14	0.86	0	0	0
Helicopter[b]	UH-60 Blackhawk	NA	NA	3	22	5	NA	194.59	0.14	0.86	0	0	0
Water Truck[o]	Heavy-duty Diesel	NA	NA	1	22	NA	10	0.37	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	135	NA	10	1.08	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.72	0.14	0.86	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	135	NA	10	0.72	0.14	0.86	0	0	0
Transition Structures Estates/Park - South of Park (C3/C4)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	1.49	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.16	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.39	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.39	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	2.82	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	4.51	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.08	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.05	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.06	0	1	0	0	0
Transition Structures Estates/Park - North of Park (C1/C2)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	10	NA	30	1.49	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	10	NA	25	0.16	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	10	NA	25	0.39	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	25	0.39	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	10	5	NA	2.82	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	10	8	NA	4.51	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	10	NA	10	0.08	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	10	NA	10	0.05	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	10	NA	10	0.06	0	1	0	0	0
Riser Structures at Oakland X													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	20	NA	30	2.99	0	1	0	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	20	NA	25	0.32	0	1	0	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	20	NA	25	0.78	0	1	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	25	0.78	0	1	0	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	1	20	5	NA	5.63	0	1	0	0	0
100 - 280 Ton Crane	Cranes	367	0.29	1	20	8	NA	9.01	0	1	0	0	0

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of Estates Dr[n]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	20	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	20	NA	10	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	20	NA	10	0	1	0	0	0
Conductor Replacement												
Line Puller	Other Construction Equipment	82	0.42	2	133	8	NA	0	4	3	0	0
Trailer-Mounted Tensioner	Other Construction Equipment	82	0.42	2	133	8	NA	0	4	3	0	0
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	4	133	7	NA	0	4	3	0	0
Transport of 55-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	4	133	NA	20	0	4	3	0	0
105-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	0	4	3	0	0
Transport of 105-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0	4	3	0	0
120-foot Crane Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	0	4	3	0	0
Transport of 120-foot Crane Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0	4	3	0	0
10,000 Pound Capacity Forklift	Forklifts	82	0.20	1	133	7	NA	0	4	3	0	0
Transport of 10,000 Pound Capacity Forklift[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0	4	3	0	0
Generator	Generator Sets	14	0.74	2	133	7	NA	0	4	3	0	0
Transport of Generator[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0	4	3	0	0
Tractor Trailer (40-foot flatbed){f}[f]	Off-Highway Trucks	376	0.38	1	133	5	NA	0	4	3	0	0
Transport of Tractor Trailer (40-foot flatbed)[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0	4	3	0	0
Light Ship Helicopter[b]	MD500	NA	NA	3	32	6	NA	0	4	3	0	0
Medium-sized Ship Helicopter[b]	407 Long Ranger/Jet	NA	NA	3	32	6	NA	0	4	3	0	0
Water Truck[o]	Heavy-duty Diesel	NA	NA	1	32	NA	10	0	4	3	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	10	133	NA	50	0	4	3	0	0
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	133	NA	50	0	4	3	0	0
Worker Commutes	Light-duty Truck	NA	NA	10	133	NA	50	0	4	3	0	0
Truck - Light Duty Pickup	Light-duty Truck	NA	NA	8	133	NA	30	0	4	3	0	0
Crew Cab Heavy Duty Pickup	Heavy-duty Diesel	NA	NA	6	133	NA	30	0	4	3	0	0
Restoration (including SWPPP inspections)												
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	20	NA	60	0	0	9	12	3
Crew Trucks	Light-duty Truck	NA	NA	2	20	NA	60	0	0	9	12	3
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0	0	9	12	3
Worker Commutes - Dry Weather Monthly Insp.	Light-duty Truck	NA	NA	1	6	NA	60	0	0	9	12	3
Worker Commutes - Wet Weather Monthly Insp.	Light-duty Truck	NA	NA	1	26	NA	60	0	0	9	12	3

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of E

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment, g/mile for vehicles, and g/LTO for helicopters)[k]						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	20	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	20	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	2	20	NA	10	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Conductor Replacement														
Line Puller	Other Construction Equipment	82	0.42	2	133	8	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
Trailer-Mounted Tensioner	Other Construction Equipment	82	0.42	2	133	8	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	4	133	7	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
Transport of 55-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	4	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
105-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
Transport of 105-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
120-foot Crane Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
Transport of 120-foot Crane Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
10,000 Pound Capacity Forklift	Forklifts	82	0.20	1	133	7	NA	0.25	3.58	2.34	0.01	0.11	0.10	528.81
Transport of 10,000 Pound Capacity Forklift[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Generator	Generator Sets	14	0.74	2	133	7	NA	0.54	2.86	4.32	0.01	0.17	0.16	570.39
Transport of Generator[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Tractor Trailer (40-foot flatbed){f}[f]	Off-Highway Trucks	376	0.38	1	133	5	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
Transport of Tractor Trailer (40-foot flatbed)[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Light Ship Helicopter[b]	MD500	NA	NA	3	32	6	NA	344.44	457.70	85.10	114.60	1.52	1.48	61,276.50
Medium-sized Ship Helicopter[b]	407 Long Ranger/Jet	NA	NA	3	32	6	NA	278.13	365.50	130.50	141.60	2.13	2.07	75,713.37
Water Truck[o]	Heavy-duty Diesel	NA	NA	1	32	NA	10	0.02	0.08	1.80	0.02	6.24	58.74	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	10	133	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	133	NA	50	0.02	0.10	1.02	0.01	0.37	0.10	1,189.11
Worker Commutes	Light-duty Truck	NA	NA	10	133	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Truck - Light Duty Pickup	Light-duty Truck	NA	NA	8	133	NA	30	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Crew Cab Heavy Duty Pickup	Heavy-duty Diesel	NA	NA	6	133	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Restoration (including SWPPP inspections)														
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	20	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Crew Trucks	Light-duty Truck	NA	NA	2	20	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes - Dry Weather Monthly Insp.	Light-duty Truck	NA	NA	1	6	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Worker Commutes - Wet Weather Monthly Insp.	Light-duty Truck	NA	NA	1	26	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of E

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	20	NA	10	0.01	0.84	0.05	0.00	0.42	0.11
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	20	NA	10	0.01	0.56	0.04	0.00	0.28	0.07
Worker Commutes	Light-duty Truck	NA	NA	2	20	NA	10	0.01	0.67	0.05	0.00	0.28	0.07
Conductor Replacement													
Line Puller	Other Construction Equipment	82	0.42	2	133	8	NA	45.56	566.14	441.73	0.81	25.53	23.43
Trailer-Mounted Tensioner	Other Construction Equipment	82	0.42	2	133	8	NA	45.56	566.14	441.73	0.81	25.53	23.43
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	4	133	7	NA	206.45	1,381.83	304.99	5.87	42.23	38.71
Transport of 55-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	4	133	NA	20	0.38	1.78	42.25	0.35	10.31	3.21
105-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	103.23	690.91	152.49	2.93	21.11	19.35
Transport of 105-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.19	0.89	21.13	0.18	5.16	1.60
120-foot Crane Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	103.23	690.91	152.49	2.93	21.11	19.35
Transport of 120-foot Crane Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.19	0.89	21.13	0.18	5.16	1.60
10,000 Pound Capacity Forklift	Forklifts	82	0.20	1	133	7	NA	8.28	120.47	78.83	0.17	3.77	3.47
Transport of 10,000 Pound Capacity Forklift[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0.09	0.45	10.56	0.09	2.58	0.80
Generator	Generator Sets	14	0.74	2	133	7	NA	22.92	121.63	183.89	0.34	7.40	6.80
Transport of Generator[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	0.19	0.89	21.13	0.18	5.16	1.60
Tractor Trailer (40-foot flatbed){f}[f]	Off-Highway Trucks	376	0.38	1	133	5	NA	36.87	246.75	54.46	1.05	7.54	6.91
Transport of Tractor Trailer (40-foot flatbed)[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	0.09	0.45	10.56	0.09	2.58	0.80
Light Ship Helicopter[b]	MD500	NA	NA	3	32	6	NA	389.31	503.22	314.31	320.63	4.95	4.83
Medium-sized Ship Helicopter[b]	407 Long Ranger/Jet	NA	NA	3	32	6	NA	330.07	424.44	497.46	409.40	7.30	7.13
Water Truck[o]	Heavy-duty Diesel	NA	NA	1	32	NA	10	0.01	0.05	1.27	0.01	4.40	41.44
Worker Commutes	Light-duty Auto/Truck	NA	NA	10	133	NA	50	1.15	93.63	6.06	0.38	46.23	11.78
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	133	NA	50	2.74	11.34	120.09	1.26	43.04	12.18
Worker Commutes	Light-duty Truck	NA	NA	10	133	NA	50	1.53	112.05	8.70	0.46	46.40	11.86
Truck - Light Duty Pickup	Light-duty Truck	NA	NA	8	133	NA	30	0.73	53.79	4.17	0.22	22.27	5.69
Crew Cab Heavy Duty Pickup	Heavy-duty Diesel	NA	NA	6	133	NA	30	0.85	4.01	95.06	0.79	23.21	7.22
Restoration (including SWPPP inspections)													
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	20	NA	60	0.04	0.20	4.77	0.04	1.16	0.36
Crew Trucks	Light-duty Truck	NA	NA	2	20	NA	60	0.06	4.04	0.31	0.02	1.67	0.43
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0.05	0.24	5.72	0.05	1.40	0.43
Worker Commutes - Dry Weather Monthly Insp.	Light-duty Truck	NA	NA	1	6	NA	60	0.01	0.61	0.05	0.00	0.25	0.06
Worker Commutes - Wet Weather Monthly Insp.	Light-duty Truck	NA	NA	1	26	NA	60	0.04	2.63	0.20	0.01	1.09	0.28

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of E

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[l]				
								CO_2e	2026	2027	2028	2029	2030
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	20	NA	10	0.16	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	20	NA	10	0.11	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	20	NA	10	0.13	0	1	0	0	0
Conductor Replacement													
Line Puller	Other Construction Equipment	82	0.42	2	133	8	NA	38.79	0	0.57	0.43	0	0
Trailer-Mounted Tensioner	Other Construction Equipment	82	0.42	2	133	8	NA	38.79	0	0.57	0.43	0	0
55-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	4	133	7	NA	282.48	0	0.57	0.43	0	0
Transport of 55-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	4	133	NA	20	17.65	0	0.57	0.43	0	0
105-foot Bucket Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	141.24	0	0.57	0.43	0	0
Transport of 105-foot Bucket Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	8.83	0	0.57	0.43	0	0
120-foot Crane Truck[f]	Off-Highway Trucks	376	0.38	2	133	7	NA	141.24	0	0.57	0.43	0	0
Transport of 120-foot Crane Truck[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	8.83	0	0.57	0.43	0	0
10,000 Pound Capacity Forklift	Forklifts	82	0.20	1	133	7	NA	8.07	0	0.57	0.43	0	0
Transport of 10,000 Pound Capacity Forklift[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	4.41	0	0.57	0.43	0	0
Generator	Generator Sets	14	0.74	2	133	7	NA	11.00	0	0.57	0.43	0	0
Transport of Generator[j]	Heavy-duty Diesel	NA	NA	2	133	NA	20	8.83	0	0.57	0.43	0	0
Tractor Trailer (40-foot flatbed){f}[f]	Off-Highway Trucks	376	0.38	1	133	5	NA	50.44	0	0.57	0.43	0	0
Transport of Tractor Trailer (40-foot flatbed)[j]	Heavy-duty Diesel	NA	NA	1	133	NA	20	4.41	0	0.57	0.43	0	0
Light Ship Helicopter[b]	MD500	NA	NA	3	32	6	NA	77.77	0	0.57	0.43	0	0
Medium-sized Ship Helicopter[b]	407 Long Ranger/Jet	NA	NA	3	32	6	NA	99.29	0	0.57	0.43	0	0
Water Truck[o]	Heavy-duty Diesel	NA	NA	1	32	NA	10	0.53	0	0.57	0.43	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	10	133	NA	50	17.72	0	0.57	0.43	0	0
Worker Commutes[g]	Medium-duty Diesel	NA	NA	8	133	NA	50	63.26	0	0.57	0.43	0	0
Worker Commutes	Light-duty Truck	NA	NA	10	133	NA	50	21.36	0	0.57	0.43	0	0
Truck - Light Duty Pickup	Light-duty Truck	NA	NA	8	133	NA	30	10.25	0	0.57	0.43	0	0
Crew Cab Heavy Duty Pickup	Heavy-duty Diesel	NA	NA	6	133	NA	30	39.72	0	0.57	0.43	0	0
Restoration (including SWPPP inspections)													
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	20	NA	60	1.99	0	0	0.38	0.5	0.13
Crew Trucks	Light-duty Truck	NA	NA	2	20	NA	60	0.77	0	0	0.38	0.5	0.13
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	2.39	0	0	0.38	0.5	0.13
Worker Commutes - Dry Weather Monthly Insp.	Light-duty Truck	NA	NA	1	6	NA	60	0.12	0	0	0.38	0.5	0.13
Worker Commutes - Wet Weather Monthly Insp.	Light-duty Truck	NA	NA	1	26	NA	60	0.50	0	0	0.38	0.5	0.13

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of Estates Dr[n]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] Hours per Day data provided for the helicopters should represent hours of operation per day for the helicopter. Quantity per day for the helicopters represents the number of LTO cycles per day. It was assumed that one of each type of

[c] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 ton =	2,000	lbs
1 metric ton =	1,000,000	g

[d] PM_{10} and $PM_{2.5}$ emissions include paved and unpaved road fugitive dust emissions associated with onroad and offroad travel, respectively, as follows:

- For Phase 1-2, each truck is expected to travel on unpaved roads for up to:	2	miles per day.		
- For Phase 1-4, each commute truck, dump truck, 4x4, and lowboy truck is expected to travel on unpaved roads for up to:	2	miles per day for	25	days.
- For Phase 1-5, each truck is expected to travel on unpaved roads for up to:	2	miles per day for	25	days (or the entire duration if used for less than 25 days).
- For Phase 1-9, the water truck is expected to travel on unpaved roads for up to:	1	mile per day.		

[e] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] Based on the usage data provided, this vehicle was treated as a construction equipment which will primarily remain onsite.

[g] Light-duty trucks with a power rating > 300 hp were conservatively treated as medium-duty trucks.

[h] Based on the equipment/vehicle type, this equipment/vehicle was assumed to be construction equipment which will primarily remain onsite and operate 8 hours per day.

[i] A number of vehicles and equipment will be used for only a portion of the total duration for each phase.

[j] These equipment will be transported to/from the site each day, with a one-way trip length of 10 miles.

[k] Emission factors associated with hourly operation of the helicopters are provided in Appendix A, Table 15 and are factored into the emissions calculations presented herein.

[l] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[m] Fugitive Dust emissions from Grading activities are a result of smoothing unpaved access roads and were estimated per the details provided below.

[n] Emissions incorporate Applicant-proposed Measures to reduce fugitive dust and construction equipment exhaust emissions, as applicable.

[o] One water truck conservatively added to each phase in which helicopters are used to minimize potential dust associated with the helicopter landing zones. It was assumed that each water truck would be used for the same number of days as the helicopters for up to 10 miles per day.

NA = Parameter not required for computing emissions.

Fugitive Dust emissions from Grading

Activity	Year	Area Graded (acres/ phase)[a]	Grader VMT (miles/ phase)[b]	Emission Factors (lb/mile)		Emissions (lb/phase)	
				PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Grading	2026	2.60	1.78	0.694	0.075	1.2	0.1
Grading	2027	0.00	0.00	0.694	0.075	0.0	0.0
Grading	2028	0.00	0.00	0.694	0.075	0.0	0.0
Grading	2029	0.00	0.00	0.694	0.075	0.0	0.0
Grading	2030	0.00	0.00	0.694	0.075	0.0	0.0

[a] Total area to be graded is as follows, based on the length of access roads to be improved and an assumed roadway width of 20 feet: 2.60 acres.

[b] Vehicle miles traveled by graders estimated as follows, per methodology provided in Section 4.4.1 of Appendix C of the *CalEEMod User's Guide* (ICF 2022):

VMT (mile/phase) = Area Graded (acres/phase) / Wb (ft) X 43,560 (ft^2/acre) / 5,280 (ft/mile), where

Wb is the blade width of the grader; the CalEEMod default for Wb is = 12 ft.

Table A5.3-5. Phase/Activity #1 - Emissions with Applicant-proposed Measures for Rebuild Lines Overhead and Remove Existing East of Estates Dr[n]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used[i]	Hours per Day	Miles per Day per Vehicle	Number of Months with Activities				
								2026	2027	2028	2029	2030

Annual Emissions Summary

Year[a]	Emissions (lbs/year)						Emissions (metric tons/ year)
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
2026	457	3,286	436	117	96	408	133
2027	1,301	6,040	3,630	1,125	499	1,062	1,214
2028	557	2,400	1,283	321	166	109	471
2029	0.10	3.86	5.52	0.06	2.79	0.78	2.88
2030	0.02	0.97	1.38	0.01	0.70	0.20	0.72

[a] Yearly emissions were estimated using a weight factor based on the schedule and months of activity per year.

Table A5.3-6. Phase/Activity #2 - Emissions for Rebuild Western Extent of Lines as Underground - West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment / Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030
Mobilization and Survey (Construction Marking, Veg Removal)												
10-Cu Dump Truck (remove green waste from trees)	Heavy-duty Diesel	NA	NA	1	3	NA	60	2	0	0	0	0
Boom Truck (tree removal)	Medium-duty Diesel	NA	NA	1	3	NA	60	2	0	0	0	0
Chain Saws	Chainsaws	1.86	0.70	2	3	4	NA	2	0	0	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	2	0	0	0	0
Utility Truck	Light-duty Truck	NA	NA	1	20	NA	15	2	0	0	0	0
Delivery Vehicles	Light-duty Truck	NA	NA	1	20	NA	15	2	0	0	0	0
Traffic Control Trucks	Light-duty Truck	NA	NA	3	10	NA	50	2	0	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	15	2	0	0	0	0
1-Ton Crew Cab Flatbed, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	15	2	0	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	10	NA	2	2	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	2	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	2	0	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	6	30	NA	50	2	0	0	0	0
Vaults (1 crew)												
CAT 328 Excavator	Excavators	36	0.38	1	120	5	NA	2	4	0	0	0
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	1	120	5	NA	2	4	0	0	0
JD 225 Excavator	Excavators	36	0.38	1	120	5	NA	2	4	0	0	0
RT 100 - Terex Rough Terrain Crane	Cranes	367	0.29	1	120	5	NA	2	4	0	0	0
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	2	4	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	2	4	0	0	0
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	1	120	5	NA	2	4	0	0	0
Concrete Truck	Off-Highway Trucks	376	0.38	2	120	8	NA	2	4	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	120	NA	50	2	4	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	120	NA	50	2	4	0	0	0
Trenching and Duct Bank (2-3 crews)												
CAT 450 Backhoe	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	2	10	0	0	0
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	2	10	0	0	0
JD 225 Excavator	Excavators	36	0.38	3	240	5	NA	2	10	0	0	0
Doosan Air Compressor 185 CFM	Air Compressors	37	0.48	3	240	5	NA	2	10	0	0	0
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	3	240	10	NA	2	10	0	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	3	240	NA	110	2	10	0	0	0
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	110	2	10	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	6	2	10	0	0	0
Ingersoll Rand DD 24 Roller	Rollers	36	0.38	1	240	10	NA	2	10	0	0	0
Volvo VNX 300 Tractor	Off-Highway Trucks	376	0.38	2	240	3	NA	2	10	0	0	0
350 kW Generator	Generator Sets	14	0.74	1	60	5	NA	2	10	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	1	60	NA	6	2	10	0	0	0
Welding Machine	Welders	46	0.45	1	60	4	NA	2	10	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	1	60	NA	6	2	10	0	0	0
Concrete Truck	Heavy-duty Diesel	NA	NA	1	90	NA	60	2	10	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	24	240	NA	50	2	10	0	0	0

Table A5.3-6. Phase/Activity #2 - Emissions for Rebuild Western Extent of Lines as Underground - West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment / Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment and g/mile for vehicles)						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Mobilization and Survey (Construction Marking, Veg Removal)														
10-Cu Dump Truck (remove green waste from trees)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Boom Truck (tree removal)	Medium-duty Diesel	NA	NA	1	3	NA	60	0.02	0.10	1.02	0.01	0.37	0.10	1,189.11
Chain Saws	Chainsaws	1.86	0.70	2	3	4	NA	47.48	128.98	1.45	0.01	0.41	0.55	694.41
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	15.90	278.24	2.11	0.01	0.01	0.01	647.75
Utility Truck	Light-duty Truck	NA	NA	1	20	NA	15	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Delivery Vehicles	Light-duty Truck	NA	NA	1	20	NA	15	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Traffic Control Trucks	Light-duty Truck	NA	NA	3	10	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	15	0.09	0.74	0.63	0.01	0.40	0.12	775.74
1-Ton Crew Cab Flatbed, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	15	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	10	NA	2	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	6	30	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Vaults (1 crew)														
CAT 328 Excavator	Excavators	36	0.38	1	120	5	NA	0.39	4.22	3.41	0.01	0.10	0.09	589.12
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	1	120	5	NA	0.18	3.48	1.89	0.01	0.06	0.06	531.42
JD 225 Excavator	Excavators	36	0.38	1	120	5	NA	0.39	4.22	3.41	0.01	0.10	0.09	589.12
RT 100 - Terex Rough Terrain Crane	Cranes	367	0.29	1	120	5	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	1	120	5	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
Concrete Truck	Off-Highway Trucks	376	0.38	2	120	8	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	120	NA	50	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	120	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Trenching and Duct Bank (2-3 crews)														
CAT 450 Backhoe	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	0.18	3.48	1.89	0.01	0.06	0.06	531.42
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	0.18	3.48	1.89	0.01	0.06	0.06	531.42
JD 225 Excavator	Excavators	36	0.38	3	240	5	NA	0.39	4.22	3.41	0.01	0.10	0.09	589.12
Doosan Air Compressor 185 CFM	Air Compressors	37	0.48	3	240	5	NA	0.51	4.82	3.65	0.01	0.10	0.09	570.35
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	3	240	10	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	3	240	NA	110	0.01	0.76	0.06	0.00	0.32	0.08	321.14
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	110	0.09	0.74	0.63	0.01	0.40	0.12	775.74
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	6	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Ingersoll Rand DD 24 Roller	Rollers	36	0.38	1	240	10	NA	0.54	4.09	3.61	0.01	0.15	0.14	589.00
Volvo VNX 300 Tractor	Off-Highway Trucks	376	0.38	2	240	3	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
350 kW Generator	Generator Sets	14	0.74	1	60	5	NA	0.54	2.86	4.32	0.01	0.17	0.16	570.39
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	1	60	NA	6	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Welding Machine	Welders	46	0.45	1	60	4	NA	0.47	4.49	3.57	0.01	0.10	0.09	570.36
Boom Truck	Heavy-duty Diesel	NA	NA	1	60	NA	6	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Concrete Truck	Heavy-duty Diesel	NA	NA	1	90	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	24	240	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53

Table A5.3-6. Phase/Activity #2 - Emissions for Rebuild Western Extent of Lines as Underground - West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment / Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
Mobilization and Survey (Construction Marking, Veg Removal)													
10-Cu Dump Truck (remove green waste from trees)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.01	0.03	0.71	0.01	0.17	0.05
Boom Truck (tree removal)	Medium-duty Diesel	NA	NA	1	3	NA	60	0.01	0.04	0.41	0.00	0.15	0.04
Chain Saws	Chainsaws	1.86	0.70	2	3	4	NA	3.27	8.89	0.10	0.00	0.03	0.04
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	1.59	27.85	0.21	0.00	0.00	0.00
Utility Truck	Light-duty Truck	NA	NA	1	20	NA	15	0.01	0.51	0.04	0.00	0.21	0.05
Delivery Vehicles	Light-duty Truck	NA	NA	1	20	NA	15	0.01	0.51	0.04	0.00	0.21	0.05
Traffic Control Trucks	Light-duty Truck	NA	NA	3	10	NA	50	0.03	2.53	0.20	0.01	1.05	0.27
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	15	0.06	0.49	0.42	0.00	0.27	0.08
1-Ton Crew Cab Flatbed, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	15	0.11	0.98	0.84	0.01	0.53	0.16
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	10	NA	2	0.00	0.00	0.08	0.00	0.02	0.01
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	0.16	12.67	0.82	0.05	6.26	1.59
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	0.16	12.67	0.82	0.05	6.26	1.59
Worker Commutes	Light-duty Truck	NA	NA	6	30	NA	50	0.21	15.17	1.18	0.06	6.28	1.60
Vaults (1 crew)													
CAT 328 Excavator	Excavators	36	0.38	1	120	5	NA	7.11	76.38	61.65	0.09	1.79	1.65
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	1	120	5	NA	7.56	143.11	77.49	0.21	2.59	2.38
JD 225 Excavator	Excavators	36	0.38	1	120	5	NA	7.11	76.38	61.65	0.09	1.79	1.65
RT 100 - Terex Rough Terrain Crane	Cranes	367	0.29	1	120	5	NA	27.87	230.46	258.61	0.70	10.56	9.71
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	2.26	19.53	16.70	0.20	10.67	3.17
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	2.26	19.53	16.70	0.20	10.67	3.17
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	1	120	5	NA	33.26	222.64	191.07	0.94	6.80	6.24
Concrete Truck	Off-Highway Trucks	376	0.38	2	120	8	NA	106.44	712.43	611.44	3.02	21.77	19.96
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	120	NA	50	0.21	1.00	23.83	0.20	5.82	1.81
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	120	NA	50	0.62	50.69	3.28	0.21	25.03	6.38
Trenching and Duct Bank (2-3 crews)													
CAT 450 Backhoe	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	45.39	858.65	464.97	1.23	15.54	14.31
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	45.39	858.65	464.97	1.23	15.54	14.31
JD 225 Excavator	Excavators	36	0.38	3	240	5	NA	42.67	458.28	369.90	0.54	10.75	9.88
Doosan Air Compressor 185 CFM	Air Compressors	37	0.48	3	240	5	NA	72.17	679.67	513.91	0.99	13.95	12.83
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	3	240	10	NA	399.16	2,671.63	2,292.88	11.34	81.65	74.84
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	3	240	NA	110	1.82	133.45	10.36	0.55	55.27	14.12
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	110	14.93	128.90	110.23	1.29	70.45	20.90
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	6	0.81	7.03	6.01	0.07	3.84	1.14
Ingersoll Rand DD 24 Roller	Rollers	36	0.38	1	240	10	NA	39.23	296.26	261.58	0.36	11.15	10.28
Volvo VNX 300 Tractor	Off-Highway Trucks	376	0.38	2	240	3	NA	79.83	534.33	458.58	2.27	16.33	14.97
350 kW Generator	Generator Sets	14	0.74	1	60	5	NA	3.69	19.60	29.63	0.05	1.19	1.10
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	1	60	NA	6	0.07	0.59	0.50	0.01	0.32	0.09
Welding Machine	Welders	46	0.45	1	60	4	NA	5.09	49.21	39.10	0.08	1.04	0.96
Boom Truck	Heavy-duty Diesel	NA	NA	1	60	NA	6	0.01	0.06	1.43	0.01	0.35	0.11
Concrete Truck	Heavy-duty Diesel	NA	NA	1	90	NA	60	0.19	0.90	21.44	0.18	5.24	1.63
Worker Commutes	Light-duty Auto/Truck	NA	NA	24	240	NA	50	4.99	405.50	26.25	1.66	200.20	51.03

Table A5.3-6. Phase/Activity #2 - Emissions for Rebuild Western Extent of Lines as Underground - West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment / Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[f]				
								CO_2e	2026	2027	2028	2029	2030
Mobilization and Survey (Construction Marking, Veg Removal)													
10-Cu Dump Truck (remove green waste from trees)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.30	1	0	0	0	0
Boom Truck (tree removal)	Medium-duty Diesel	NA	NA	1	3	NA	60	0.21	1	0	0	0	0
Chain Saws	Chainsaws	1.86	0.70	2	3	4	NA	0.02	1	0	0	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	0.03	1	0	0	0	0
Utility Truck	Light-duty Truck	NA	NA	1	20	NA	15	0.10	1	0	0	0	0
Delivery Vehicles	Light-duty Truck	NA	NA	1	20	NA	15	0.10	1	0	0	0	0
Traffic Control Trucks	Light-duty Truck	NA	NA	3	10	NA	50	0.48	1	0	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	15	0.23	1	0	0	0	0
1-Ton Crew Cab Flatbed, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	15	0.47	1	0	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	10	NA	2	0.03	1	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	2.40	1	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	2.40	1	0	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	6	30	NA	50	2.89	1	0	0	0	0
Vaults (1 crew)													
CAT 328 Excavator	Excavators	36	0.38	1	120	5	NA	4.84	0.33	0.67	0	0	0
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	1	120	5	NA	9.91	0.33	0.67	0	0	0
JD 225 Excavator	Excavators	36	0.38	1	120	5	NA	4.84	0.33	0.67	0	0	0
RT 100 - Terex Rough Terrain Crane	Cranes	367	0.29	1	120	5	NA	33.79	0.33	0.67	0	0	0
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	9.31	0.33	0.67	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	9.31	0.33	0.67	0	0	0
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	1	120	5	NA	45.51	0.33	0.67	0	0	0
Concrete Truck	Off-Highway Trucks	376	0.38	2	120	8	NA	145.64	0.33	0.67	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	120	NA	50	9.96	0.33	0.67	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	120	NA	50	9.60	0.33	0.67	0	0	0
Trenching and Duct Bank (2-3 crews)													
CAT 450 Backhoe	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	59.46	0.17	0.83	0	0	0
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	59.46	0.17	0.83	0	0	0
JD 225 Excavator	Excavators	36	0.38	3	240	5	NA	29.01	0.17	0.83	0	0	0
Doosan Air Compressor 185 CFM	Air Compressors	37	0.48	3	240	5	NA	36.47	0.17	0.83	0	0	0
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	3	240	10	NA	546.14	0.17	0.83	0	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	3	240	NA	110	25.43	0.17	0.83	0	0	0
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	110	61.44	0.17	0.83	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	6	3.35	0.17	0.83	0	0	0
Ingersoll Rand DD 24 Roller	Rollers	36	0.38	1	240	10	NA	19.34	0.17	0.83	0	0	0
Volvo VNX 300 Tractor	Off-Highway Trucks	376	0.38	2	240	3	NA	109.23	0.17	0.83	0	0	0
350 kW Generator	Generator Sets	14	0.74	1	60	5	NA	1.77	0.17	0.83	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	1	60	NA	6	0.28	0.17	0.83	0	0	0
Welding Machine	Welders	46	0.45	1	60	4	NA	2.83	0.17	0.83	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	1	60	NA	6	0.60	0.17	0.83	0	0	0
Concrete Truck	Heavy-duty Diesel	NA	NA	1	90	NA	60	8.96	0.17	0.83	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	24	240	NA	50	76.76	0.17	0.83	0	0	0

Table A5.3-6. Phase/Activity #2 - Emissions for Rebuild Western Extent of Lines as Underground - West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment / Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030
Cable Installation and Splicing (2 Crews)												
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	55	NA	50	0	5	3	0	0
Semi Tractor	Off-Highway Trucks	376	0.38	1	34	5	NA	0	5	3	0	0
Cable Winch	Other Construction Equipment	82	0.42	1	55	5	NA	0	5	3	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	90	NA	50	0	5	3	0	0
Cable Reel Cart	Other Construction Equipment	82	0.42	1	55	5	NA	0	5	3	0	0
2 kW Generator	Generator Sets	14	0.74	1	90	10	NA	0	5	3	0	0
Vacuum Truck	Heavy-duty Diesel	NA	NA	1	4	NA	35	0	5	3	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	90	NA	50	0	5	3	0	0
Cable System Comissioning and Testing (1 Crew)												
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	15	NA	50	0	0	1	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	15	NA	50	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	15	NA	50	0	0	1	0	0
Restoration and Paving												
Utility Truck	Light-duty Truck	NA	NA	1	25	NA	50	0	2	0	0	0
Traffic Control Trucks	Light-duty Truck	NA	NA	3	25	NA	50	0	2	0	0	0
Delivery Vehicles	Light-duty Truck	NA	NA	1	25	NA	50	0	2	0	0	0
Drum Type Compactor	Other Construction Equipment	82	0.42	1	25	5	NA	0	2	0	0	0
Road Grader	Other Construction Equipment	82	0.42	1	25	5	NA	0	2	0	0	0
Street Sweeper	Sweepers/Scrubbers	36	0.46	1	20	5	NA	0	2	0	0	0
Road Paving Machine	Other Construction Equipment	82	0.42	1	20	5	NA	0	2	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0	2	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0	2	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	6	25	NA	50	0	2	0	0	0
Inspections												
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	25	NA	50	2	12	4	0	0
Inspector Vehicles	Light-duty Auto/Truck	NA	NA	2	317	NA	50	2	12	4	0	0
Truck Drivers/Hauling												
Material Haul Trucks	Heavy-duty Diesel	NA	NA	14	122	NA	50	2	10	0	0	0
Long Haul Dump Truck	Heavy-duty Diesel	NA	NA	1	106	NA	50	2	10	0	0	0
Replant/Water Landscape Trees (2 Years)												
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	10	NA	60	0	2	12	10	0
Crew Trucks	Light-duty Truck	NA	NA	2	10	NA	60	0	2	12	10	0
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0	2	12	10	0

Table A5.3-6. Phase/Activity #2 - Emissions for Rebuild Western Extent of Lines as Underground - West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment / Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment and g/mile for vehicles)						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Cable Installation and Splicing (2 Crews)														
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	55	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Semi Tractor	Off-Highway Trucks	376	0.38	1	34	5	NA	0.18	1.18	1.01	0.01	0.04	0.03	530.89
Cable Winch	Other Construction Equipment	82	0.42	1	55	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	90	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Cable Reel Cart	Other Construction Equipment	82	0.42	1	55	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
2 kW Generator	Generator Sets	14	0.74	1	90	10	NA	0.54	2.86	4.32	0.01	0.17	0.16	570.39
Vacuum Truck	Heavy-duty Diesel	NA	NA	1	4	NA	35	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	90	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Cable System Comissioning and Testing (1 Crew)														
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	15	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	15	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	15	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Restoration and Paving														
Utility Truck	Light-duty Truck	NA	NA	1	25	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Traffic Control Trucks	Light-duty Truck	NA	NA	3	25	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Delivery Vehicles	Light-duty Truck	NA	NA	1	25	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Drum Type Compactor	Other Construction Equipment	82	0.42	1	25	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
Road Grader	Other Construction Equipment	82	0.42	1	25	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
Street Sweeper	Sweepers/Scrubbers	36	0.46	1	20	5	NA	0.58	4.73	3.76	0.01	0.17	0.16	588.75
Road Paving Machine	Other Construction Equipment	82	0.42	1	20	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	6	25	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Inspections														
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	25	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Inspector Vehicles	Light-duty Auto/Truck	NA	NA	2	317	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Truck Drivers/Hauling														
Material Haul Trucks	Heavy-duty Diesel	NA	NA	14	122	NA	50	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Long Haul Dump Truck	Heavy-duty Diesel	NA	NA	1	106	NA	50	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Replant/Water Landscape Trees (2 Years)														
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	10	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Crew Trucks	Light-duty Truck	NA	NA	2	10	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19

Table A5.3-6. Phase/Activity #2 - Emissions for Rebuild Western Extent of Lines as Underground - West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment / Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
Cable Installation and Splicing (2 Crews)													
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	55	NA	50	1.04	8.95	7.66	0.09	4.89	1.45
Semi Tractor	Off-Highway Trucks	376	0.38	1	34	5	NA	9.42	63.08	54.14	0.27	1.93	1.77
Cable Winch	Other Construction Equipment	82	0.42	1	55	5	NA	5.89	73.16	57.08	0.10	3.30	3.03
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	90	NA	50	0.21	15.17	1.18	0.06	6.28	1.60
Cable Reel Cart	Other Construction Equipment	82	0.42	1	55	5	NA	5.89	73.16	57.08	0.10	3.30	3.03
2 kW Generator	Generator Sets	14	0.74	1	90	10	NA	11.08	58.79	88.88	0.16	3.58	3.29
Vacuum Truck	Heavy-duty Diesel	NA	NA	1	4	NA	35	0.00	0.02	0.56	0.00	0.14	0.04
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	90	NA	50	2.50	202.75	13.13	0.83	100.10	25.52
Cable System Comissioning and Testing (1 Crew)													
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	15	NA	50	0.28	2.44	2.09	0.02	1.33	0.40
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	15	NA	50	0.03	2.53	0.20	0.01	1.05	0.27
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	15	NA	50	0.42	33.79	2.19	0.14	16.68	4.25
Restoration and Paving													
Utility Truck	Light-duty Truck	NA	NA	1	25	NA	50	0.03	2.11	0.16	0.01	0.87	0.22
Traffic Control Trucks	Light-duty Truck	NA	NA	3	25	NA	50	0.09	6.32	0.49	0.03	2.62	0.67
Delivery Vehicles	Light-duty Truck	NA	NA	1	25	NA	50	0.03	2.11	0.16	0.01	0.87	0.22
Drum Type Compactor	Other Construction Equipment	82	0.42	1	25	5	NA	2.68	33.26	25.95	0.05	1.50	1.38
Road Grader	Other Construction Equipment	82	0.42	1	25	5	NA	2.68	33.26	25.95	0.05	1.50	1.38
Street Sweeper	Sweepers/Scrubbers	36	0.46	1	20	5	NA	2.13	17.27	13.72	0.02	0.62	0.57
Road Paving Machine	Other Construction Equipment	82	0.42	1	20	5	NA	2.14	26.60	20.76	0.04	1.20	1.10
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0.13	10.56	0.68	0.04	5.21	1.33
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0.13	10.56	0.68	0.04	5.21	1.33
Worker Commutes	Light-duty Truck	NA	NA	6	25	NA	50	0.17	12.64	0.98	0.05	5.23	1.34
Inspections													
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	25	NA	50	0.04	3.52	0.23	0.01	1.74	0.44
Inspector Vehicles	Light-duty Auto/Truck	NA	NA	2	317	NA	50	0.55	44.63	2.89	0.18	22.04	5.62
Truck Drivers/Hauling													
Material Haul Trucks	Heavy-duty Diesel	NA	NA	14	122	NA	50	3.04	14.29	339.12	2.83	82.79	25.75
Long Haul Dump Truck	Heavy-duty Diesel	NA	NA	1	106	NA	50	0.19	0.89	21.05	0.18	5.14	1.60
Replant/Water Landscape Trees (2 Years)													
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	10	NA	60	0.02	0.10	2.38	0.02	0.58	0.18
Crew Trucks	Light-duty Truck	NA	NA	2	10	NA	60	0.03	2.02	0.16	0.01	0.84	0.21
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0.05	0.24	5.72	0.05	1.40	0.43

Table A5.3-6. Phase/Activity #2 - Emissions for Rebuild Western Extent of Lines as Underground - West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment / Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[f]				
								CO_2e	2026	2027	2028	2029	2030
Cable Installation and Splicing (2 Crews)													
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	55	NA	50	4.27	0	0.63	0.38	0	0
Semi Tractor	Off-Highway Trucks	376	0.38	1	34	5	NA	12.89	0	0.63	0.38	0	0
Cable Winch	Other Construction Equipment	82	0.42	1	55	5	NA	5.01	0	0.63	0.38	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	90	NA	50	2.89	0	0.63	0.38	0	0
Cable Reel Cart	Other Construction Equipment	82	0.42	1	55	5	NA	5.01	0	0.63	0.38	0	0
2 kW Generator	Generator Sets	14	0.74	1	90	10	NA	5.32	0	0.63	0.38	0	0
Vacuum Truck	Heavy-duty Diesel	NA	NA	1	4	NA	35	0.23	0	0.63	0.38	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	90	NA	50	38.38	0	0.63	0.38	0	0
Cable System Comissioning and Testing (1 Crew)													
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	15	NA	50	1.16	0	0	1	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	15	NA	50	0.48	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	15	NA	50	6.40	0	0	1	0	0
Restoration and Paving													
Utility Truck	Light-duty Truck	NA	NA	1	25	NA	50	0.40	0	1	0	0	0
Traffic Control Trucks	Light-duty Truck	NA	NA	3	25	NA	50	1.20	0	1	0	0	0
Delivery Vehicles	Light-duty Truck	NA	NA	1	25	NA	50	0.40	0	1	0	0	0
Drum Type Compactor	Other Construction Equipment	82	0.42	1	25	5	NA	2.28	0	1	0	0	0
Road Grader	Other Construction Equipment	82	0.42	1	25	5	NA	2.28	0	1	0	0	0
Street Sweeper	Sweepers/Scrubbers	36	0.46	1	20	5	NA	0.97	0	1	0	0	0
Road Paving Machine	Other Construction Equipment	82	0.42	1	20	5	NA	1.82	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	2.00	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	2.00	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	6	25	NA	50	2.41	0	1	0	0	0
Inspections													
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	25	NA	50	0.67	0.11	0.67	0.22	0	0
Inspector Vehicles	Light-duty Auto/Truck	NA	NA	2	317	NA	50	8.45	0.11	0.67	0.22	0	0
Truck Drivers/Hauling													
Material Haul Trucks	Heavy-duty Diesel	NA	NA	14	122	NA	50	141.69	0.17	0.83	0	0	0
Long Haul Dump Truck	Heavy-duty Diesel	NA	NA	1	106	NA	50	8.79	0.17	0.83	0	0	0
Replant/Water Landscape Trees (2 Years)													
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	10	NA	60	1.00	0	0.08	0.5	0.42	0
Crew Trucks	Light-duty Truck	NA	NA	2	10	NA	60	0.39	0	0.08	0.5	0.42	0
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	2.39	0	0.08	0.5	0.42	0

Table A5.3-6. Phase/Activity #2 - Emissions for Rebuild Western Extent of Lines as Underground - West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment / Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[c] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[d] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[e] A number of vehicles and equipment will be used for only a portion of the total duration for each phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

NA = Parameter not required for computing emissions.

Annual Emissions Summary

Year[a]	Emissions (lbs/year)						Emissions (metric tons/year)
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
2026	197	1,791	1,352	6.33	155	69.9	303
2027	795	7,463	5,675	26.1	675	301	1,249
2028	14.4	236	114	0.87	72	21.6	40
2029	0.04	0.98	3.44	0.03	1.17	0.35	1.57
2030	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[a] Yearly emissions were estimated using a weight factor based on the schedule and months of activity per year.

Table A5.3-7. Phase/Activity #2 - Emissions with Applicant-proposed Measures for Rebuild Western Extent of Lines as Underground - West of Estates Dr[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030
Mobilization and Survey (Construction Marking, Veg Removal)												
10-Cu Dump Truck (remove green waste from trees)	Heavy-duty Diesel	NA	NA	1	3	NA	60	2	0	0	0	0
Boom Truck (tree removal)	Medium-duty Diesel	NA	NA	1	3	NA	60	2	0	0	0	0
Chain Saws	Chainsaws	1.86	0.70	2	3	4	NA	2	0	0	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	2	0	0	0	0
Utility Truck	Light-duty Truck	NA	NA	1	20	NA	15	2	0	0	0	0
Delivery Vehicles	Light-duty Truck	NA	NA	1	20	NA	15	2	0	0	0	0
Traffic Control Trucks	Light-duty Truck	NA	NA	3	10	NA	50	2	0	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	15	2	0	0	0	0
1-Ton Crew Cab Flatbed, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	15	2	0	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	10	NA	2	2	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	2	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	2	0	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	6	30	NA	50	2	0	0	0	0
Vaults (1 Crew)												
CAT 328 Excavator	Excavators	36	0.38	1	120	5	NA	2	4	0	0	0
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	1	120	5	NA	2	4	0	0	0
JD 225 Excavator	Excavators	36	0.38	1	120	5	NA	2	4	0	0	0
RT 100 - Terex Rough Terrain Crane	Cranes	367	0.29	1	120	5	NA	2	4	0	0	0
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	2	4	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	2	4	0	0	0
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	1	120	5	NA	2	4	0	0	0
Concrete Truck	Off-Highway Trucks	376	0.38	2	120	8	NA	2	4	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	120	NA	50	2	4	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	120	NA	50	2	4	0	0	0
Trenching and Duct Bank (2-3 Crews)												
CAT 450 Backhoe	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	2	10	0	0	0
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	2	10	0	0	0
JD 225 Excavator	Excavators	36	0.38	3	240	5	NA	2	10	0	0	0
Doosan Air Compressor 185 CFM	Air Compressors	37	0.48	3	240	5	NA	2	10	0	0	0
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	3	240	10	NA	2	10	0	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	3	240	NA	110	2	10	0	0	0
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	110	2	10	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	6	2	10	0	0	0
Ingersoll Rand DD 24 Roller	Rollers	36	0.38	1	240	10	NA	2	10	0	0	0
Volvo VNX 300 Tractor	Off-Highway Trucks	376	0.38	2	240	3	NA	2	10	0	0	0
350 kW Generator	Generator Sets	14	0.74	1	60	5	NA	2	10	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	1	60	NA	6	2	10	0	0	0
Welding Machine	Welders	46	0.45	1	60	4	NA	2	10	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	1	60	NA	6	2	10	0	0	0
Concrete Truck	Heavy-duty Diesel	NA	NA	1	90	NA	60	2	10	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	24	240	NA	50	2	10	0	0	0

Table A5.3-7. Phase/Activity #2 - Emissions with Applicant-proposed Measures for Rebuild Western Extent of Lines as Underground - West

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment and g/mile for vehicles)						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Mobilization and Survey (Construction Marking, Veg Removal)														
10-Cu Dump Truck (remove green waste from trees)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Boom Truck (tree removal)	Medium-duty Diesel	NA	NA	1	3	NA	60	0.02	0.10	1.02	0.01	0.37	0.10	1,189.11
Chain Saws	Chainsaws	1.86	0.70	2	3	4	NA	47.48	128.98	1.45	0.01	0.41	0.55	694.41
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	15.90	278.24	2.11	0.01	0.01	0.01	647.75
Utility Truck	Light-duty Truck	NA	NA	1	20	NA	15	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Delivery Vehicles	Light-duty Truck	NA	NA	1	20	NA	15	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Traffic Control Trucks	Light-duty Truck	NA	NA	3	10	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	15	0.09	0.74	0.63	0.01	0.40	0.12	775.74
1-Ton Crew Cab Flatbed, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	15	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	10	NA	2	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	6	30	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Vaults (1 Crew)														
CAT 328 Excavator	Excavators	36	0.38	1	120	5	NA	0.39	4.22	3.41	0.01	0.10	0.09	589.12
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	1	120	5	NA	0.18	3.48	0.26	0.01	0.06	0.06	531.42
JD 225 Excavator	Excavators	36	0.38	1	120	5	NA	0.39	4.22	3.41	0.01	0.10	0.09	589.12
RT 100 - Terex Rough Terrain Crane	Cranes	367	0.29	1	120	5	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	1	120	5	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
Concrete Truck	Off-Highway Trucks	376	0.38	2	120	8	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	120	NA	50	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	120	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Trenching and Duct Bank (2-3 Crews)														
CAT 450 Backhoe	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	0.18	3.48	0.26	0.01	0.06	0.06	531.42
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	0.18	3.48	0.26	0.01	0.06	0.06	531.42
JD 225 Excavator	Excavators	36	0.38	3	240	5	NA	0.39	4.22	3.41	0.01	0.10	0.09	589.12
Doosan Air Compressor 185 CFM	Air Compressors	37	0.48	3	240	5	NA	0.51	4.82	3.65	0.01	0.10	0.09	570.35
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	3	240	10	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	3	240	NA	110	0.01	0.76	0.06	0.00	0.32	0.08	321.14
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	110	0.09	0.74	0.63	0.01	0.40	0.12	775.74
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	6	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Ingersoll Rand DD 24 Roller	Rollers	36	0.38	1	240	10	NA	0.54	4.09	3.61	0.01	0.15	0.14	589.00
Volvo VNX 300 Tractor	Off-Highway Trucks	376	0.38	2	240	3	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
350 kW Generator	Generator Sets	14	0.74	1	60	5	NA	0.54	2.86	4.32	0.01	0.17	0.16	570.39
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	1	60	NA	6	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Welding Machine	Welders	46	0.45	1	60	4	NA	0.47	4.49	3.57	0.01	0.10	0.09	570.36
Boom Truck	Heavy-duty Diesel	NA	NA	1	60	NA	6	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Concrete Truck	Heavy-duty Diesel	NA	NA	1	90	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	24	240	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53

Table A5.3-7. Phase/Activity #2 - Emissions with Applicant-proposed Measures for Rebuild Western Extent of Lines as Underground - West

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
Mobilization and Survey (Construction Marking, Veg Removal)													
10-Cu Dump Truck (remove green waste from trees)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.01	0.03	0.71	0.01	0.17	0.05
Boom Truck (tree removal)	Medium-duty Diesel	NA	NA	1	3	NA	60	0.01	0.04	0.41	0.00	0.15	0.04
Chain Saws	Chainsaws	1.86	0.70	2	3	4	NA	3.27	8.89	0.10	0.00	0.03	0.04
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	1.59	27.85	0.21	0.00	0.00	0.00
Utility Truck	Light-duty Truck	NA	NA	1	20	NA	15	0.01	0.51	0.04	0.00	0.21	0.05
Delivery Vehicles	Light-duty Truck	NA	NA	1	20	NA	15	0.01	0.51	0.04	0.00	0.21	0.05
Traffic Control Trucks	Light-duty Truck	NA	NA	3	10	NA	50	0.03	2.53	0.20	0.01	1.05	0.27
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	15	0.06	0.49	0.42	0.00	0.27	0.08
1-Ton Crew Cab Flatbed, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	15	0.11	0.98	0.84	0.01	0.53	0.16
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	10	NA	2	0.00	0.00	0.08	0.00	0.02	0.01
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	0.16	12.67	0.82	0.05	6.26	1.59
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	0.16	12.67	0.82	0.05	6.26	1.59
Worker Commutes	Light-duty Truck	NA	NA	6	30	NA	50	0.21	15.17	1.18	0.06	6.28	1.60
Vaults (1 Crew)													
CAT 328 Excavator	Excavators	36	0.38	1	120	5	NA	7.11	76.38	61.65	0.09	1.79	1.65
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	1	120	5	NA	7.56	143.11	10.69	0.21	2.59	2.38
JD 225 Excavator	Excavators	36	0.38	1	120	5	NA	7.11	76.38	61.65	0.09	1.79	1.65
RT 100 - Terex Rough Terrain Crane	Cranes	367	0.29	1	120	5	NA	27.87	230.46	36.60	0.70	10.56	9.71
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	2.26	19.53	16.70	0.20	10.67	3.17
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	2.26	19.53	16.70	0.20	10.67	3.17
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	1	120	5	NA	33.26	222.64	49.14	0.94	6.80	6.24
Concrete Truck	Off-Highway Trucks	376	0.38	2	120	8	NA	106.44	712.43	157.24	3.02	21.77	19.96
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	120	NA	50	0.21	1.00	23.83	0.20	5.82	1.81
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	120	NA	50	0.62	50.69	3.28	0.21	25.03	6.38
Trenching and Duct Bank (2-3 Crews)													
CAT 450 Backhoe	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	45.39	858.65	64.13	1.23	15.54	14.31
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	45.39	858.65	64.13	1.23	15.54	14.31
JD 225 Excavator	Excavators	36	0.38	3	240	5	NA	42.67	458.28	369.90	0.54	10.75	9.88
Doosan Air Compressor 185 CFM	Air Compressors	37	0.48	3	240	5	NA	72.17	679.67	513.91	0.99	13.95	12.83
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	3	240	10	NA	399.16	2,671.63	589.66	11.34	81.65	74.84
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	3	240	NA	110	1.82	133.45	10.36	0.55	55.27	14.12
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	110	14.93	128.90	110.23	1.29	70.45	20.90
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	6	0.81	7.03	6.01	0.07	3.84	1.14
Ingersoll Rand DD 24 Roller	Rollers	36	0.38	1	240	10	NA	39.23	296.26	261.58	0.36	11.15	10.28
Volvo VNX 300 Tractor	Off-Highway Trucks	376	0.38	2	240	3	NA	79.83	534.33	117.93	2.27	16.33	14.97
350 kW Generator	Generator Sets	14	0.74	1	60	5	NA	3.69	19.60	29.63	0.05	1.19	1.10
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	1	60	NA	6	0.07	0.59	0.50	0.01	0.32	0.09
Welding Machine	Welders	46	0.45	1	60	4	NA	5.09	49.21	39.10	0.08	1.04	0.96
Boom Truck	Heavy-duty Diesel	NA	NA	1	60	NA	6	0.01	0.06	1.43	0.01	0.35	0.11
Concrete Truck	Heavy-duty Diesel	NA	NA	1	90	NA	60	0.19	0.90	21.44	0.18	5.24	1.63
Worker Commutes	Light-duty Auto/Truck	NA	NA	24	240	NA	50	4.99	405.50	26.25	1.66	200.20	51.03

Table A5.3-7. Phase/Activity #2 - Emissions with Applicant-proposed Measures for Rebuild Western Extent of Lines as Underground - West

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[f]				
								CO_2e	2026	2027	2028	2029	2030
Mobilization and Survey (Construction Marking, Veg Removal)													
10-Cu Dump Truck (remove green waste from trees)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.30	1	0	0	0	0
Boom Truck (tree removal)	Medium-duty Diesel	NA	NA	1	3	NA	60	0.21	1	0	0	0	0
Chain Saws	Chainsaws	1.86	0.70	2	3	4	NA	0.02	1	0	0	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	0.03	1	0	0	0	0
Utility Truck	Light-duty Truck	NA	NA	1	20	NA	15	0.10	1	0	0	0	0
Delivery Vehicles	Light-duty Truck	NA	NA	1	20	NA	15	0.10	1	0	0	0	0
Traffic Control Trucks	Light-duty Truck	NA	NA	3	10	NA	50	0.48	1	0	0	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	10	NA	15	0.23	1	0	0	0	0
1-Ton Crew Cab Flatbed, 4 × 4	Heavy-duty Truck	NA	NA	2	20	NA	15	0.47	1	0	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	10	NA	2	0.03	1	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	2.40	1	0	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	30	NA	50	2.40	1	0	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	6	30	NA	50	2.89	1	0	0	0	0
Vaults (1 Crew)													
CAT 328 Excavator	Excavators	36	0.38	1	120	5	NA	4.84	0.33	0.67	0	0	0
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	1	120	5	NA	9.91	0.33	0.67	0	0	0
JD 225 Excavator	Excavators	36	0.38	1	120	5	NA	4.84	0.33	0.67	0	0	0
RT 100 - Terex Rough Terrain Crane	Cranes	367	0.29	1	120	5	NA	33.79	0.33	0.67	0	0	0
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	9.31	0.33	0.67	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	120	NA	50	9.31	0.33	0.67	0	0	0
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	1	120	5	NA	45.51	0.33	0.67	0	0	0
Concrete Truck	Off-Highway Trucks	376	0.38	2	120	8	NA	145.64	0.33	0.67	0	0	0
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	1	120	NA	50	9.96	0.33	0.67	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	120	NA	50	9.60	0.33	0.67	0	0	0
Trenching and Duct Bank (2-3 Crews)													
CAT 450 Backhoe	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	59.46	0.17	0.83	0	0	0
CAT 928 Loader	Tractors/Loaders/Backhoes	84	0.37	3	240	5	NA	59.46	0.17	0.83	0	0	0
JD 225 Excavator	Excavators	36	0.38	3	240	5	NA	29.01	0.17	0.83	0	0	0
Doosan Air Compressor 185 CFM	Air Compressors	37	0.48	3	240	5	NA	36.47	0.17	0.83	0	0	0
T 880 Kenworth Dump Truck	Off-Highway Trucks	376	0.38	3	240	10	NA	546.14	0.17	0.83	0	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	3	240	NA	110	25.43	0.17	0.83	0	0	0
2500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	110	61.44	0.17	0.83	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	3	240	NA	6	3.35	0.17	0.83	0	0	0
Ingersoll Rand DD 24 Roller	Rollers	36	0.38	1	240	10	NA	19.34	0.17	0.83	0	0	0
Volvo VNX 300 Tractor	Off-Highway Trucks	376	0.38	2	240	3	NA	109.23	0.17	0.83	0	0	0
350 kW Generator	Generator Sets	14	0.74	1	60	5	NA	1.77	0.17	0.83	0	0	0
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	1	60	NA	6	0.28	0.17	0.83	0	0	0
Welding Machine	Welders	46	0.45	1	60	4	NA	2.83	0.17	0.83	0	0	0
Boom Truck	Heavy-duty Diesel	NA	NA	1	60	NA	6	0.60	0.17	0.83	0	0	0
Concrete Truck	Heavy-duty Diesel	NA	NA	1	90	NA	60	8.96	0.17	0.83	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	24	240	NA	50	76.76	0.17	0.83	0	0	0

Table A5.3-7. Phase/Activity #2 - Emissions with Applicant-proposed Measures for Rebuild Western Extent of Lines as Underground - West of Estates Dr[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030
Cable Installation and Splicing (2 Crews)												
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	55	NA	50	0	5	3	0	0
Semi Tractor	Off-Highway Trucks	376	0.38	1	34	5	NA	0	5	3	0	0
Cable Winch	Other Construction Equipment	82	0.42	1	55	5	NA	0	5	3	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	90	NA	50	0	5	3	0	0
Cable Reel Cart	Other Construction Equipment	82	0.42	1	55	5	NA	0	5	3	0	0
2 kW Generator	Generator Sets	14	0.74	1	90	10	NA	0	5	3	0	0
Vacuum Truck	Heavy-duty Diesel	NA	NA	1	4	NA	35	0	5	3	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	90	NA	50	0	5	3	0	0
Cable System Comissioning and Testing (1 Crew)												
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	15	NA	50	0	0	1	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	15	NA	50	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	15	NA	50	0	0	1	0	0
Restoration and Paving												
Utility Truck	Light-duty Truck	NA	NA	1	25	NA	50	0	2	0	0	0
Traffic Control Trucks	Light-duty Truck	NA	NA	3	25	NA	50	0	2	0	0	0
Delivery Vehicles	Light-duty Truck	NA	NA	1	25	NA	50	0	2	0	0	0
Drum Type Compactor	Other Construction Equipment	82	0.42	1	25	5	NA	0	2	0	0	0
Road Grader	Other Construction Equipment	82	0.42	1	25	5	NA	0	2	0	0	0
Street Sweeper	Sweepers/Scrubbers	36	0.46	1	20	5	NA	0	2	0	0	0
Road Paving Machine	Other Construction Equipment	82	0.42	1	20	5	NA	0	2	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0	2	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0	2	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	6	25	NA	50	0	2	0	0	0
Inspections												
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	25	NA	50	2	12	4	0	0
Inspector Vehicles	Light-duty Auto/Truck	NA	NA	2	317	NA	50	2	12	4	0	0
Truck Drivers/Hauling												
Material Haul Trucks	Heavy-duty Diesel	NA	NA	14	122	NA	50	2	10	0	0	0
Long Haul Dump Truck	Heavy-duty Diesel	NA	NA	1	106	NA	50	2	10	0	0	0
Replant/Water Landscape Trees (2 Years)												
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	10	NA	60	0	2	12	10	0
Crew Trucks	Light-duty Truck	NA	NA	2	10	NA	60	0	2	12	10	0
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0	2	12	10	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[c] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[d] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[e] A number of vehicles and equipment will be used for only a portion of the total duration for each phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Emissions incorporate Applicant-proposed Measures to reduce construction equipment exhaust emissions, as applicable.

NA = Parameter not required for computing emissions.

Table A5.3-7. Phase/Activity #2 - Emissions with Applicant-proposed Measures for Rebuild Western Extent of Lines as Underground - West

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emission factors (g/hp-hr for equipment and g/mile for vehicles)						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Cable Installation and Splicing (2 Crews)														
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	55	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Semi Tractor	Off-Highway Trucks	376	0.38	1	34	5	NA	0.18	1.18	0.26	0.01	0.04	0.03	530.89
Cable Winch	Other Construction Equipment	82	0.42	1	55	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	90	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Cable Reel Cart	Other Construction Equipment	82	0.42	1	55	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
2 kW Generator	Generator Sets	14	0.74	1	90	10	NA	0.54	2.86	4.32	0.01	0.17	0.16	570.39
Vacuum Truck	Heavy-duty Diesel	NA	NA	1	4	NA	35	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	90	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Cable System Comissioning and Testing (1 Crew)														
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	15	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	15	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	15	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Restoration and Paving														
Utility Truck	Light-duty Truck	NA	NA	1	25	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Traffic Control Trucks	Light-duty Truck	NA	NA	3	25	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Delivery Vehicles	Light-duty Truck	NA	NA	1	25	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Drum Type Compactor	Other Construction Equipment	82	0.42	1	25	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
Road Grader	Other Construction Equipment	82	0.42	1	25	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
Street Sweeper	Sweepers/Scrubbers	36	0.46	1	20	5	NA	0.58	4.73	3.76	0.01	0.17	0.16	588.75
Road Paving Machine	Other Construction Equipment	82	0.42	1	20	5	NA	0.28	3.50	2.73	0.01	0.16	0.15	529.26
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	6	25	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Inspections														
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	25	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Inspector Vehicles	Light-duty Auto/Truck	NA	NA	2	317	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Truck Drivers/Hauling														
Material Haul Trucks	Heavy-duty Diesel	NA	NA	14	122	NA	50	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Long Haul Dump Truck	Heavy-duty Diesel	NA	NA	1	106	NA	50	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Replant/Water Landscape Trees (2 Years)														
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	10	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Crew Trucks	Light-duty Truck	NA	NA	2	10	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[c] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[d] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[e] A number of vehicles and equipment will be used for only a portion of the total duration for each phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Emissions incorporate Applicant-proposed Measures to reduce construction equipment exhaust emissions, as applicable.

NA = Parameter not required for computing emissions.

Table A5.3-7. Phase/Activity #2 - Emissions with Applicant-proposed Measures for Rebuild Western Extent of Lines as Underground - West

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[c]					
								ROG	CO	NOx	SOx	PM_{10}[d]	$PM_{2.5}$[d]
Cable Installation and Splicing (2 Crews)													
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	55	NA	50	1.04	8.95	7.66	0.09	4.89	1.45
Semi Tractor	Off-Highway Trucks	376	0.38	1	34	5	NA	9.42	63.08	13.92	0.27	1.93	1.77
Cable Winch	Other Construction Equipment	82	0.42	1	55	5	NA	5.89	73.16	57.08	0.10	3.30	3.03
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	90	NA	50	0.21	15.17	1.18	0.06	6.28	1.60
Cable Reel Cart	Other Construction Equipment	82	0.42	1	55	5	NA	5.89	73.16	57.08	0.10	3.30	3.03
2 kW Generator	Generator Sets	14	0.74	1	90	10	NA	11.08	58.79	88.88	0.16	3.58	3.29
Vacuum Truck	Heavy-duty Diesel	NA	NA	1	4	NA	35	0.00	0.02	0.56	0.00	0.14	0.04
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	90	NA	50	2.50	202.75	13.13	0.83	100.10	25.52
Cable System Comissioning and Testing (1 Crew)													
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	15	NA	50	0.28	2.44	2.09	0.02	1.33	0.40
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	15	NA	50	0.03	2.53	0.20	0.01	1.05	0.27
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	15	NA	50	0.42	33.79	2.19	0.14	16.68	4.25
Restoration and Paving													
Utility Truck	Light-duty Truck	NA	NA	1	25	NA	50	0.03	2.11	0.16	0.01	0.87	0.22
Traffic Control Trucks	Light-duty Truck	NA	NA	3	25	NA	50	0.09	6.32	0.49	0.03	2.62	0.67
Delivery Vehicles	Light-duty Truck	NA	NA	1	25	NA	50	0.03	2.11	0.16	0.01	0.87	0.22
Drum Type Compactor	Other Construction Equipment	82	0.42	1	25	5	NA	2.68	33.26	25.95	0.05	1.50	1.38
Road Grader	Other Construction Equipment	82	0.42	1	25	5	NA	2.68	33.26	25.95	0.05	1.50	1.38
Street Sweeper	Sweepers/Scrubbers	36	0.46	1	20	5	NA	2.13	17.27	13.72	0.02	0.62	0.57
Road Paving Machine	Other Construction Equipment	82	0.42	1	20	5	NA	2.14	26.60	20.76	0.04	1.20	1.10
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0.13	10.56	0.68	0.04	5.21	1.33
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	0.13	10.56	0.68	0.04	5.21	1.33
Worker Commutes	Light-duty Truck	NA	NA	6	25	NA	50	0.17	12.64	0.98	0.05	5.23	1.34
Inspections													
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	25	NA	50	0.04	3.52	0.23	0.01	1.74	0.44
Inspector Vehicles	Light-duty Auto/Truck	NA	NA	2	317	NA	50	0.55	44.63	2.89	0.18	22.04	5.62
Truck Drivers/Hauling													
Material Haul Trucks	Heavy-duty Diesel	NA	NA	14	122	NA	50	3.04	14.29	339.12	2.83	82.79	25.75
Long Haul Dump Truck	Heavy-duty Diesel	NA	NA	1	106	NA	50	0.19	0.89	21.05	0.18	5.14	1.60
Replant/Water Landscape Trees (2 Years)													
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	10	NA	60	0.02	0.10	2.38	0.02	0.58	0.18
Crew Trucks	Light-duty Truck	NA	NA	2	10	NA	60	0.03	2.02	0.16	0.01	0.84	0.21
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	0.05	0.24	5.72	0.05	1.40	0.43

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[c] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[d] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[e] A number of vehicles and equipment will be used for only a portion of the total duration for each phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Emissions incorporate Applicant-proposed Measures to reduce construction equipment exhaust emissions, as applicable.

NA = Parameter not required for computing emissions.

Table A5.3-7. Phase/Activity #2 - Emissions with Applicant-proposed Measures for Rebuild Western Extent of Lines as Underground - West

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[c]	Weight Factor[f]				
								CO_2e	2026	2027	2028	2029	2030
Cable Installation and Splicing (2 Crews)													
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	55	NA	50	4.27	0	0.63	0.38	0	0
Semi Tractor	Off-Highway Trucks	376	0.38	1	34	5	NA	12.89	0	0.63	0.38	0	0
Cable Winch	Other Construction Equipment	82	0.42	1	55	5	NA	5.01	0	0.63	0.38	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	90	NA	50	2.89	0	0.63	0.38	0	0
Cable Reel Cart	Other Construction Equipment	82	0.42	1	55	5	NA	5.01	0	0.63	0.38	0	0
2 kW Generator	Generator Sets	14	0.74	1	90	10	NA	5.32	0	0.63	0.38	0	0
Vacuum Truck	Heavy-duty Diesel	NA	NA	1	4	NA	35	0.23	0	0.63	0.38	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	90	NA	50	38.38	0	0.63	0.38	0	0
Cable System Comissioning and Testing (1 Crew)													
3500 Dodge Ram Pickup	Heavy-duty Truck	NA	NA	2	15	NA	50	1.16	0	0	1	0	0
1500 Dodge Ram Pickup	Light-duty Truck	NA	NA	2	15	NA	50	0.48	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	32	15	NA	50	6.40	0	0	1	0	0
Restoration and Paving													
Utility Truck	Light-duty Truck	NA	NA	1	25	NA	50	0.40	0	1	0	0	0
Traffic Control Trucks	Light-duty Truck	NA	NA	3	25	NA	50	1.20	0	1	0	0	0
Delivery Vehicles	Light-duty Truck	NA	NA	1	25	NA	50	0.40	0	1	0	0	0
Drum Type Compactor	Other Construction Equipment	82	0.42	1	25	5	NA	2.28	0	1	0	0	0
Road Grader	Other Construction Equipment	82	0.42	1	25	5	NA	2.28	0	1	0	0	0
Street Sweeper	Sweepers/Scrubbers	36	0.46	1	20	5	NA	0.97	0	1	0	0	0
Road Paving Machine	Other Construction Equipment	82	0.42	1	20	5	NA	1.82	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	2.00	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	6	25	NA	50	2.00	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	6	25	NA	50	2.41	0	1	0	0	0
Inspections													
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	25	NA	50	0.67	0.11	0.67	0.22	0	0
Inspector Vehicles	Light-duty Auto/Truck	NA	NA	2	317	NA	50	8.45	0.11	0.67	0.22	0	0
Truck Drivers/Hauling													
Material Haul Trucks	Heavy-duty Diesel	NA	NA	14	122	NA	50	141.69	0.17	0.83	0	0	0
Long Haul Dump Truck	Heavy-duty Diesel	NA	NA	1	106	NA	50	8.79	0.17	0.83	0	0	0
Replant/Water Landscape Trees (2 Years)													
Flat Bed (plants to install)	Heavy-duty Diesel	NA	NA	1	10	NA	60	1.00	0	0.08	0.5	0.42	0
Crew Trucks	Light-duty Truck	NA	NA	2	10	NA	60	0.39	0	0.08	0.5	0.42	0
Water Truck	Heavy-duty Diesel	NA	NA	1	24	NA	60	2.39	0	0.08	0.5	0.42	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[c] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[d] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[e] A number of vehicles and equipment will be used for only a portion of the total duration for each phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Emissions incorporate Applicant-proposed Measures to reduce construction equipment exhaust emissions, as applicable.

NA = Parameter not required for computing emissions.

Table A5.3-7. Phase/Activity #2 - Emissions with Applicant-proposed Measures for Rebuild Western Extent of Lines as Underground - West of Estates Dr[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[b]	Equipment Load Factor[b]	Quantity per Day	Number of Days Used[e]	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030

Annual Emissions Summary

Year[a]	Emissions (lbs/year)						Emissions (metric tons/
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
2026	197	1,791	583	6.33	155	69.9	303
2027	795	7,463	2,689	26.1	675	301	1,249
2028	14.4	236	99	0.87	72	21.6	40
2029	0.04	0.98	3.44	0.03	1.17	0.35	1.57
2030	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[a] Yearly emissions were estimated using a weight factor based on the schedule and months of activity per year.

Table A5.3-8. Phase/Activity #3 - Emissions for Remove Existing Structures and Conductors West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030
ROW Clearing												
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	3	NA	60	0	0	1	0	0
Boom Truck (remove green waste)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0	0	1	0	0
Chain Saws	Chainsaws	1.86	0.70	1	3	4	NA	0	0	1	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	0	0	1	0	0
Blowers	Leaf Blowers/Vacuums	1.79	0.94	1	3	4	NA	0	0	1	0	0
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	1	3	4	NA	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	3	NA	60	0	0	1	0	0
Structure Removal (Poles and Towers)												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	40	NA	30	0	0	2	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	40	NA	25	0	0	2	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	40	NA	25	0	0	2	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	40	NA	25	0	0	2	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	40	5	NA	0	0	2	0	0
100 - 280 Ton Crane	Cranes	367	0.29	3	40	8	NA	0	0	2	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	40	NA	10	0	0	2	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	10	0	0	2	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	40	NA	10	0	0	2	0	0
Restoration												
Worker Commutes - Inspection[e]	Light-duty Truck	NA	NA	1	2	NA	60	0	0	1	0	0
Flat Bed (plants to install)[e]	Heavy-duty Diesel	NA	NA	1	2	NA	60	0	0	1	0	0
Crew Trucks	Light-duty Truck	NA	NA	2	5	NA	60	0	0	1	0	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[e] These vehicles will be used for only a portion of the total duration for this phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

NA = Parameter not required for computing emissions.

Table A5.3-8. Phase/Activity #3 - Emissions for Remove Existing Structures and Conductors West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Emission Factors (g/hp-hr for equipment and g/mile for vehicles)						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
ROW Clearing														
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Boom Truck (remove green waste)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Chain Saws	Chainsaws	1.86	0.70	1	3	4	NA	47.48	128.98	1.45	0.01	0.41	0.55	694.41
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	15.90	278.24	2.11	0.01	0.01	0.01	647.75
Blowers	Leaf Blowers/Vacuums	1.79	0.94	1	3	4	NA	40.08	135.48	0.64	0.01	0.44	0.58	908.57
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	1	3	4	NA	14.81	304.46	4.86	0.01	0.08	0.10	812.30
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	3	NA	60	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Structure Removal (Poles and Towers)														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	40	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	40	NA	25	0.01	0.76	0.06	0.00	0.32	0.08	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	40	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	40	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	40	5	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	3	40	8	NA	0.20	1.64	1.84	0.01	0.08	0.07	529.18
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	40	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	2	40	NA	10	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Restoration														
Worker Commutes - Inspection[e]	Light-duty Truck	NA	NA	1	2	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Flat Bed (plants to install)[e]	Heavy-duty Diesel	NA	NA	1	2	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Crew Trucks	Light-duty Truck	NA	NA	2	5	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[e] These vehicles will be used for only a portion of the total duration for this phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

NA = Parameter not required for computing emissions.

Table A5.3-8. Phase/Activity #3 - Emissions for Remove Existing Structures and Conductors West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[b]						Emissions (metric tons/ phase)[b]
								ROG	CO	NOx	SOx	PM_{10} [c]	$PM_{2.5}$ [c]	CO_2e
ROW Clearing														
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.01	0.03	0.71	0.01	0.17	0.05	0.30
Boom Truck (remove green waste)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.01	0.03	0.71	0.01	0.17	0.05	0.30
Chain Saws	Chainsaws	1.86	0.70	1	3	4	NA	1.64	4.44	0.05	0.00	0.01	0.02	0.01
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	1.59	27.85	0.21	0.00	0.00	0.00	0.03
Blowers	Leaf Blowers/Vacuums	1.79	0.94	1	3	4	NA	1.78	6.03	0.03	0.00	0.02	0.03	0.02
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	1	3	4	NA	0.62	12.75	0.20	0.00	0.00	0.00	0.02
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	3	NA	60	0.00	0.25	0.02	0.00	0.13	0.03	0.05
Structure Removal (Poles and Towers)														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	40	NA	30	0.13	0.60	14.30	0.12	3.49	1.09	5.97
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	40	NA	25	0.05	3.37	0.26	0.01	1.40	0.36	0.64
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	40	NA	25	0.38	3.25	2.78	0.03	1.78	0.53	1.55
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	40	NA	25	0.38	3.25	2.78	0.03	1.78	0.53	1.55
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	40	5	NA	18.58	153.64	172.41	0.47	7.04	6.48	22.53
100 - 280 Ton Crane	Cranes	367	0.29	3	40	8	NA	44.60	368.73	413.78	1.13	16.89	15.54	54.07
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	40	NA	10	0.02	1.69	0.11	0.01	0.83	0.21	0.32
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	10	0.01	1.13	0.07	0.00	0.56	0.14	0.21
Worker Commutes	Light-duty Truck	NA	NA	2	40	NA	10	0.02	1.35	0.10	0.01	0.56	0.14	0.26
Restoration														
Worker Commutes - Inspection[e]	Light-duty Truck	NA	NA	1	2	NA	60	0.00	0.20	0.02	0.00	0.08	0.02	0.04
Flat Bed (plants to install)[e]	Heavy-duty Diesel	NA	NA	1	2	NA	60	0.00	0.02	0.48	0.00	0.12	0.04	0.20
Crew Trucks	Light-duty Truck	NA	NA	2	5	NA	60	0.01	1.01	0.08	0.00	0.42	0.11	0.19

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[e] These vehicles will be used for only a portion of the total duration for this phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

NA = Parameter not required for computing emissions.

Table A5.3-8. Phase/Activity #3 - Emissions for Remove Existing Structures and Conductors West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Weight Factor[f]				
								2026	2027	2028	2029	2030
ROW Clearing												
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	3	NA	60	0	0	1	0	0
Boom Truck (remove green waste)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0	0	1	0	0
Chain Saws	Chainsaws	1.86	0.70	1	3	4	NA	0	0	1	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	0	0	1	0	0
Blowers	Leaf Blowers/Vacuums	1.79	0.94	1	3	4	NA	0	0	1	0	0
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	1	3	4	NA	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	3	NA	60	0	0	1	0	0
Structure Removal (Poles and Towers)												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	40	NA	30	0	0	1	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	40	NA	25	0	0	1	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	40	NA	25	0	0	1	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	40	NA	25	0	0	1	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	40	5	NA	0	0	1	0	0
100 - 280 Ton Crane	Cranes	367	0.29	3	40	8	NA	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	40	NA	10	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	10	0	0	1	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	40	NA	10	0	0	1	0	0
Restoration												
Worker Commutes - Inspection[e]	Light-duty Truck	NA	NA	1	2	NA	60	0	0	1	0	0
Flat Bed (plants to install)[e]	Heavy-duty Diesel	NA	NA	1	2	NA	60	0	0	1	0	0
Crew Trucks	Light-duty Truck	NA	NA	2	5	NA	60	0	0	1	0	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[e] These vehicles will be used for only a portion of the total duration for this phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

NA = Parameter not required for computing emissions.

Table A5.3-8. Phase/Activity #3 - Emissions for Remove Existing Structures and Conductors West of Estates Dr

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030

Annual Emissions Summary

Year[a]	Emissions (lbs/year)						Emissions (metric tons/year)
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
2026	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028	69.8	590	609	1.84	35.5	25.4	88.3
2029	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[a] Yearly emissions were estimated using a weight factor based on the schedule and months of activity per year.

Table A5.3-9. Phase/Activity #3 - Emissions with Applicant-proposed Measures for Remove Existing Structures and Conductors West of Estates Dr[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030
ROW Clearing												
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	3	NA	60	0	0	1	0	0
Boom Truck (remove green waste)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0	0	1	0	0
Chain Saws	Chainsaws	1.86	0.70	1	3	4	NA	0	0	1	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	0	0	1	0	0
Blowers	Leaf Blowers/Vacuums	1.79	0.94	1	3	4	NA	0	0	1	0	0
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	1	3	4	NA	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	3	NA	60	0	0	1	0	0
Structure Removal (Poles and Towers)												
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	40	NA	30	0	0	2	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	40	NA	25	0	0	2	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	40	NA	25	0	0	2	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	40	NA	25	0	0	2	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	40	5	NA	0	0	2	0	0
100 - 280 Ton Crane	Cranes	367	0.29	3	40	8	NA	0	0	2	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	40	NA	10	0	0	2	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	10	0	0	2	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	40	NA	10	0	0	2	0	0
Restoration												
Worker Commutes - Inspection[e]	Light-duty Truck	NA	NA	1	2	NA	60	0	0	1	0	0
Flat Bed (plants to install)[e]	Heavy-duty Diesel	NA	NA	1	2	NA	60	0	0	1	0	0
Crew Trucks	Light-duty Truck	NA	NA	2	5	NA	60	0	0	1	0	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[e] These vehicles will be used for only a portion of the total duration for this phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Emissions incorporate Applicant-proposed Measures to reduce construction equipment exhaust emissions, as applicable.

NA = Parameter not required for computing emissions.

Table A5.3-9. Phase/Activity #3 - Emissions with Applicant-proposed Measures for Remove Existing Structures and Conductors

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Emission Factors (g/hp-hr for equipment and g/mile for vehicles)						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
ROW Clearing														
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Boom Truck (remove green waste)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Chain Saws	Chainsaws	1.86	0.70	1	3	4	NA	47.48	128.98	1.45	0.01	0.41	0.55	694.41
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	15.90	278.24	2.11	0.01	0.01	0.01	647.75
Blowers	Leaf Blowers/Vacuums	1.79	0.94	1	3	4	NA	40.08	135.48	0.64	0.01	0.44	0.58	908.57
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	1	3	4	NA	14.81	304.46	4.86	0.01	0.08	0.10	812.30
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	3	NA	60	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Structure Removal (Poles and Towers)														
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	40	NA	30	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	40	NA	25	0.01	0.76	0.06	0.00	0.32	0.08	321.14
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	40	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	40	NA	25	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	40	5	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
100 - 280 Ton Crane	Cranes	367	0.29	3	40	8	NA	0.20	1.64	0.26	0.01	0.08	0.07	529.18
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	40	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	10	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	2	40	NA	10	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Restoration														
Worker Commutes - Inspection[e]	Light-duty Truck	NA	NA	1	2	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Flat Bed (plants to install)[e]	Heavy-duty Diesel	NA	NA	1	2	NA	60	0.02	0.08	1.80	0.02	0.44	0.14	1,659.19
Crew Trucks	Light-duty Truck	NA	NA	2	5	NA	60	0.01	0.76	0.06	0.00	0.32	0.08	321.14

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[e] These vehicles will be used for only a portion of the total duration for this phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Emissions incorporate Applicant-proposed Measures to reduce construction equipment exhaust emissions, as applicable.

NA = Parameter not required for computing emissions.

Table A5.3-9. Phase/Activity #3 - Emissions with Applicant-proposed Measures for Remove Existing Structures and Conductors

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[b]					
								ROG	CO	NOx	SOx	PM_{10}[c]	$PM_{2.5}$[c]
ROW Clearing													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.01	0.03	0.71	0.01	0.17	0.05
Boom Truck (remove green waste)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.01	0.03	0.71	0.01	0.17	0.05
Chain Saws	Chainsaws	1.86	0.70	1	3	4	NA	1.64	4.44	0.05	0.00	0.01	0.02
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	1.59	27.85	0.21	0.00	0.00	0.00
Blowers	Leaf Blowers/Vacuums	1.79	0.94	1	3	4	NA	1.78	6.03	0.03	0.00	0.02	0.03
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	1	3	4	NA	0.62	12.75	0.20	0.00	0.00	0.00
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	3	NA	60	0.00	0.25	0.02	0.00	0.13	0.03
Structure Removal (Poles and Towers)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	40	NA	30	0.13	0.60	14.30	0.12	3.49	1.09
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	40	NA	25	0.05	3.37	0.26	0.01	1.40	0.36
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	40	NA	25	0.38	3.25	2.78	0.03	1.78	0.53
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	40	NA	25	0.38	3.25	2.78	0.03	1.78	0.53
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	40	5	NA	18.58	153.64	24.40	0.47	7.04	6.48
100 - 280 Ton Crane	Cranes	367	0.29	3	40	8	NA	44.60	368.73	58.56	1.13	16.89	15.54
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	40	NA	10	0.02	1.69	0.11	0.01	0.83	0.21
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	10	0.01	1.13	0.07	0.00	0.56	0.14
Worker Commutes	Light-duty Truck	NA	NA	2	40	NA	10	0.02	1.35	0.10	0.01	0.56	0.14
Restoration													
Worker Commutes - Inspection[e]	Light-duty Truck	NA	NA	1	2	NA	60	0.00	0.20	0.02	0.00	0.08	0.02
Flat Bed (plants to install)[e]	Heavy-duty Diesel	NA	NA	1	2	NA	60	0.00	0.02	0.48	0.00	0.12	0.04
Crew Trucks	Light-duty Truck	NA	NA	2	5	NA	60	0.01	1.01	0.08	0.00	0.42	0.11

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[e] These vehicles will be used for only a portion of the total duration for this phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Emissions incorporate Applicant-proposed Measures to reduce construction equipment exhaust emissions, as applicable.

NA = Parameter not required for computing emissions.

Table A5.3-9. Phase/Activity #3 - Emissions with Applicant-proposed Measures for Remove Existing Structures and Conductors

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Emissions (metric tons/ phase)[b]	Weight Factor[f]				
								CO_2e	2026	2027	2028	2029	2030
ROW Clearing													
10-Cu Dump Truck	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.30	0	0	1	0	0
Boom Truck (remove green waste)	Heavy-duty Diesel	NA	NA	1	3	NA	60	0.30	0	0	1	0	0
Chain Saws	Chainsaws	1.86	0.70	1	3	4	NA	0.01	0	0	1	0	0
Large Chipper (12 inch diameter veg)	Chippers/Stump Grinders/Shredders Preempt	4.85	0.78	1	3	4	NA	0.03	0	0	1	0	0
Blowers	Leaf Blowers/Vacuums	1.79	0.94	1	3	4	NA	0.02	0	0	1	0	0
Weed Wacker	Trimmers/Edgers/Brush Cutters	1.74	0.91	1	3	4	NA	0.02	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	3	NA	60	0.05	0	0	1	0	0
Structure Removal (Poles and Towers)													
Lowboy Truck/Trailer	Heavy-duty Diesel	NA	NA	3	40	NA	30	5.97	0	0	1	0	0
Truck - Framer (Crew Pick Up)	Light-duty Truck	NA	NA	2	40	NA	25	0.64	0	0	1	0	0
F250 4X4 Crewcab (3/4 T) Foreman	Heavy-duty Truck	NA	NA	2	40	NA	25	1.55	0	0	1	0	0
¾-Ton Pick-up Truck, 4 × 4	Heavy-duty Truck	NA	NA	2	40	NA	25	1.55	0	0	1	0	0
Truck Cranes - 20 - 30 Ton	Cranes	367	0.29	2	40	5	NA	22.53	0	0	1	0	0
100 - 280 Ton Crane	Cranes	367	0.29	3	40	8	NA	54.07	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	3	40	NA	10	0.32	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	10	0.21	0	0	1	0	0
Worker Commutes	Light-duty Truck	NA	NA	2	40	NA	10	0.26	0	0	1	0	0
Restoration													
Worker Commutes - Inspection[e]	Light-duty Truck	NA	NA	1	2	NA	60	0.04	0	0	1	0	0
Flat Bed (plants to install)[e]	Heavy-duty Diesel	NA	NA	1	2	NA	60	0.20	0	0	1	0	0
Crew Trucks	Light-duty Truck	NA	NA	2	5	NA	60	0.19	0	0	1	0	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Default equipment power ratings and load factors were used from Table G-12 or Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[e] These vehicles will be used for only a portion of the total duration for this phase.

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Emissions incorporate Applicant-proposed Measures to reduce construction equipment exhaust emissions, as applicable.

NA = Parameter not required for computing emissions.

Table A5.3-9. Phase/Activity #3 - Emissions with Applicant-proposed Measures for Remove Existing Structures and Conductors West of Estates Dr[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[d]	Equipment Load Factor[d]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030

Annual Emissions Summary

Year[a]	Emissions (lbs/year)						Emissions (metric tons/year)
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
2026	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028	69.8	590	106	1.84	35.5	25.4	88.3
2029	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[a] Yearly emissions were estimated using a weight factor based on the schedule and months of activity per year.

Table A5.3-10. Phase/Activity #4a - Emissions for Construction Activities at Moraga Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030
Equipment Delivery and Setup												
1-Ton Crew Cab Pickup (delivery)[d]	Heavy-duty truck	NA	NA	1	1	NA	50	0	1	0	0	0
Equipment Installation												
Forklift	Forklifts	82	0.2	1	2	5	NA	0	2	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0	2	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	40	NA	50	0	2	1	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0	2	1	0	0
Dress/Test/Wire Equipment												
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0	1	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	40	NA	50	0	1	1	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0	1	1	0	0
Equipment Removal												
1-Ton Crew Cab Pickup (delivery)	Heavy-duty truck	NA	NA	1	1	NA	50	0	0	1	0	0
Inspections												
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	20	NA	50	0	0	1	0	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Mileage assumed consistent with other similarly sized vehicles used for this phase.

[e] Default equipment power ratings and load factors were used from Table G-12 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Applicant-proposed Measures are not relevant to the equipment used for this phase; therefore, separate emission estimates with incorporation of Applicant-proposed Measures are not provided.

NA = Parameter not required for computing emissions.

Table A5.3-10. Phase/Activity #4a - Emissions for Construction Activities at Moraga Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Emission Factors (g/hp-hr for equipment and g/mile for vehicles)						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Equipment Delivery and Setup														
1-Ton Crew Cab Pickup (delivery)[d]	Heavy-duty truck	NA	NA	1	1	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Equipment Installation														
Forklift	Forklifts	82	0.2	1	2	5	NA	0.25	3.58	2.34	0.01	0.11	0.10	528.81
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	40	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Dress/Test/Wire Equipment														
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	40	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Equipment Removal														
1-Ton Crew Cab Pickup (delivery)	Heavy-duty truck	NA	NA	1	1	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Inspections														
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	20	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Mileage assumed consistent with other similarly sized vehicles used for this phase.

[e] Default equipment power ratings and load factors were used from Table G-12 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Applicant-proposed Measures are not relevant to the equipment used for this phase; therefore, separate emission estimates with incorporation of Applicant-proposed Measures are not provided.

NA = Parameter not required for computing emissions.

Table A5.3-10. Phase/Activity #4a - Emissions for Construction Activities at Moraga Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[b]						Emissions (metric tons/ phase)[b]
								ROG	CO	NOx	SOx	PM_{10}[c]	$PM_{2.5}$[c]	CO_2e
Equipment Delivery and Setup														
1-Ton Crew Cab Pickup (delivery)[d]	Heavy-duty truck	NA	NA	1	1	NA	50	0.01	0.08	0.07	0.00	0.04	0.01	0.04
Equipment Installation														
Forklift	Forklifts	82	0.2	1	2	5	NA	0.09	1.29	0.85	0.00	0.04	0.04	0.09
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0.07	5.63	0.36	0.02	2.78	0.71	1.07
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	40	NA	50	0.00	0.00	0.00	0.00	0.00	0.00	0.53
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0.00	0.00	0.00	0.00	0.00	0.00	0.64
Dress/Test/Wire Equipment														
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0.07	5.63	0.36	0.02	2.78	0.71	1.07
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	40	NA	50	0.00	0.00	0.00	0.00	0.00	0.00	0.53
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0.00	0.00	0.00	0.00	0.00	0.00	0.64
Equipment Removal														
1-Ton Crew Cab Pickup (delivery)	Heavy-duty truck	NA	NA	1	1	NA	50	0.01	0.08	0.07	0.00	0.04	0.01	0.04
Inspections														
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	20	NA	50	0.02	1.41	0.09	0.01	0.70	0.18	0.27

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Mileage assumed consistent with other similarly sized vehicles used for this phase.

[e] Default equipment power ratings and load factors were used from Table G-12 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Applicant-proposed Measures are not relevant to the equipment used for this phase; therefore, separate emission estimates with incorporation of Applicant-proposed Measures are not provided.

NA = Parameter not required for computing emissions.

Table A5.3-10. Phase/Activity #4a - Emissions for Construction Activities at Moraga Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Weight Factor[f]				
								2026	2027	2028	2029	2030
Equipment Delivery and Setup												
1-Ton Crew Cab Pickup (delivery)[d]	Heavy-duty truck	NA	NA	1	1	NA	50	0	1	0	0	0
Equipment Installation												
Forklift	Forklifts	82	0.2	1	2	5	NA	0	0.67	0.33	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0	0.67	0.33	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	40	NA	50	0	0.67	0.33	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0	0.67	0.33	0	0
Dress/Test/Wire Equipment												
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0	0.5	0.5	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	40	NA	50	0	0.5	0.5	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0	0.5	0.5	0	0
Equipment Removal												
1-Ton Crew Cab Pickup (delivery)	Heavy-duty truck	NA	NA	1	1	NA	50	0	0	1	0	0
Inspections												
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	20	NA	50	0	0	1	0	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Mileage assumed consistent with other similarly sized vehicles used for this phase.

[e] Default equipment power ratings and load factors were used from Table G-12 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Applicant-proposed Measures are not relevant to the equipment used for this phase; therefore, separate emission estimates with incorporation of Applicant-proposed Measures are not provided.

NA = Parameter not required for computing emissions.

Table A5.3-10. Phase/Activity #4a - Emissions for Construction Activities at Moraga Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030

Annual Emissions Summary

Year[a]	Emissions (lbs/year)						Emissions (metric tons/year)
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
2026	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027	0.15	7.52	1.06	0.03	3.32	0.87	2.71
2028	0.11	6.62	0.75	0.03	3.07	0.79	2.20
2029	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[a] Yearly emissions were estimated using a weight factor based on the schedule and months of activity per year.

Table A5.3-11. Phase/Activity #4b - Emissions for Construction Activities at Oakland X Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030
Equipment Delivery and Setup												
Fork Lift	Forklifts	82	0.20	1	1	8	NA	0	1	0	0	0
1-Ton Crew Cab Pickup (delivery)[d]	Heavy-duty Truck	NA	NA	1	1	NA	50	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	1	NA	50	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	1	NA	50	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	1	NA	50	0	1	0	0	0
Equipment Installation												
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	80	NA	50	0	3	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	80	NA	50	0	3	1	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	80	NA	50	0	3	1	0	0
Dress/Test/Wire Equipment												
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0	0	2	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0	0	2	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0	0	2	0	0
Equipment Removal												
1-Ton Crew Cab Pickup (delivery)	Heavy-duty Truck	NA	NA	1	1	NA	50	0	0	1	0	0
Inspections												
Pick-up Truck	Light-duty Truck	NA	NA	3	40	NA	50	0	0	2	0	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Mileage assumed consistent with other similarly sized vehicles used for this phase.

[e] Default equipment power ratings and load factors were used from Table G-12 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Applicant-proposed Measures are not relevant to the equipment used for this phase; therefore, separate emission estimates with incorporation of Applicant-proposed Measures are not provided.

NA = Parameter not required for computing emissions.

Table A5.3-11. Phase/Activity #4b - Emissions for Construction Activities at Oakland X Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Emission Factors (g/hp-hr for equipment and g/mile for vehicles)						
								ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
Equipment Delivery and Setup														
Fork Lift	Forklifts	82	0.20	1	1	8	NA	0.25	3.58	2.34	0.01	0.11	0.10	528.81
1-Ton Crew Cab Pickup (delivery)[d]	Heavy-duty Truck	NA	NA	1	1	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	1	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	1	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	1	1	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Equipment Installation														
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	80	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	80	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	1	80	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Dress/Test/Wire Equipment														
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0.01	0.64	0.04	0.00	0.32	0.08	266.53
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14
Equipment Removal														
1-Ton Crew Cab Pickup (delivery)	Heavy-duty Truck	NA	NA	1	1	NA	50	0.09	0.74	0.63	0.01	0.40	0.12	775.74
Inspections														
Pick-up Truck	Light-duty Truck	NA	NA	3	40	NA	50	0.01	0.76	0.06	0.00	0.32	0.08	321.14

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Mileage assumed consistent with other similarly sized vehicles used for this phase.

[e] Default equipment power ratings and load factors were used from Table G-12 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Applicant-proposed Measures are not relevant to the equipment used for this phase; therefore, separate emission estimates with incorporation of Applicant-proposed Measures are not provided.

NA = Parameter not required for computing emissions.

Table A5.3-11. Phase/Activity #4b - Emissions for Construction Activities at Oakland X Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Emissions (lbs/phase)[b]						Emissions (metric tons/ phase)[b]
								ROG	CO	NOx	SOx	PM_{10}[c]	$PM_{2.5}$[c]	CO_2e
Equipment Delivery and Setup														
Fork Lift	Forklifts	82	0.20	1	1	8	NA	0.07	1.04	0.68	0.00	0.03	0.03	0.07
1-Ton Crew Cab Pickup (delivery)[d]	Heavy-duty Truck	NA	NA	1	1	NA	50	0.01	0.08	0.07	0.00	0.04	0.01	0.04
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	1	NA	50	0.00	0.14	0.01	0.00	0.07	0.02	0.03
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	1	NA	50	0.00	0.07	0.00	0.00	0.03	0.01	0.01
Worker Commutes	Light-duty Truck	NA	NA	1	1	NA	50	0.00	0.08	0.01	0.00	0.03	0.01	0.02
Equipment Installation														
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	80	NA	50	0.14	11.26	0.73	0.05	5.56	1.42	2.13
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	80	NA	50	0.14	11.26	0.73	0.05	5.56	1.42	2.13
Worker Commutes	Light-duty Truck	NA	NA	1	80	NA	50	0.09	6.74	0.52	0.03	2.79	0.71	1.28
Dress/Test/Wire Equipment														
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0.07	5.63	0.36	0.02	2.78	0.71	1.07
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0.07	5.63	0.36	0.02	2.78	0.71	1.07
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0.05	3.37	0.26	0.01	1.40	0.36	0.64
Equipment Removal														
1-Ton Crew Cab Pickup (delivery)	Heavy-duty Truck	NA	NA	1	1	NA	50	0.01	0.08	0.07	0.00	0.04	0.01	0.04
Inspections														
Pick-up Truck	Light-duty Truck	NA	NA	3	40	NA	50	0.14	10.11	0.78	0.04	4.19	1.07	1.93

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Mileage assumed consistent with other similarly sized vehicles used for this phase.

[e] Default equipment power ratings and load factors were used from Table G-12 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Applicant-proposed Measures are not relevant to the equipment used for this phase; therefore, separate emission estimates with incorporation of Applicant-proposed Measures are not provided.

NA = Parameter not required for computing emissions.

Table A5.3-11. Phase/Activity #4b - Emissions for Construction Activities at Oakland X Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Weight Factor[f]				
								2026	2027	2028	2029	2030
Equipment Delivery and Setup												
Fork Lift	Forklifts	82	0.20	1	1	8	NA	0	1	0	0	0
1-Ton Crew Cab Pickup (delivery)[d]	Heavy-duty Truck	NA	NA	1	1	NA	50	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	1	NA	50	0	1	0	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	1	1	NA	50	0	1	0	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	1	NA	50	0	1	0	0	0
Equipment Installation												
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	80	NA	50	0	0.75	0.25	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	80	NA	50	0	0.75	0.25	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	80	NA	50	0	0.75	0.25	0	0
Dress/Test/Wire Equipment												
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0	0	1	0	0
Worker Commutes	Light-duty Auto/Truck	NA	NA	2	40	NA	50	0	0	1	0	0
Worker Commutes	Light-duty Truck	NA	NA	1	40	NA	50	0	0	1	0	0
Equipment Removal												
1-Ton Crew Cab Pickup (delivery)	Heavy-duty Truck	NA	NA	1	1	NA	50	0	0	1	0	0
Inspections												
Pick-up Truck	Light-duty Truck	NA	NA	3	40	NA	50	0	0	1	0	0

[a] Unless otherwise noted, equipment/vehicle list and daily use provided by PG&E.

[b] The following conversion factors were used to estimate emissions:

1 lb =	453.6	g
1 metric ton =	1,000,000	g
1 ton =	2,000	lbs

[c] PM_{10} and $PM_{2.5}$ emissions include paved road fugitive dust emissions associated with onroad travel; there is no travel on unpaved roads associated with this phase.

[d] Mileage assumed consistent with other similarly sized vehicles used for this phase.

[e] Default equipment power ratings and load factors were used from Table G-12 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] The weight factors are used to calculate annual emissions below and are derived based on the months of activity per year during the construction period.

[g] Applicant-proposed Measures are not relevant to the equipment used for this phase; therefore, separate emission estimates with incorporation of Applicant-proposed Measures are not provided.

NA = Parameter not required for computing emissions.

Table A5.3-11. Phase/Activity #4b - Emissions for Construction Activities at Oakland X Substation[g]

PG&E Moraga-Oakland X 115 kV Rebuild Project

Vehicle and Equipment Emissions

Equipment/Vehicle List[a]	Equipment/Vehicle Type	Equipment Power Rating (hp)[e]	Equipment Load Factor[e]	Quantity per Day	Number of Days Used	Hours per Day	Miles per Day per Vehicle	Months with Activities				
								2026	2027	2028	2029	2030

Annual Emissions Summary

Year[a]	Emissions (lbs/year)						Emissions (metric tons/year)
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e
2026	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027	0.36	23.4	2.25	0.09	10.7	2.74	4.33
2028	0.42	32.1	2.34	0.13	14.7	3.74	6.13
2029	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2030	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[a] Yearly emissions were estimated using a weight factor based on the schedule and months of activity per year.

Table A5.3-12. Fugitive Dust Emission Factors

PG&E Moraga-Oakland X 115 kV Rebuild Project

Fugitive Dust Emission Factors for Grading

Grading Equipment Passes

Parameter	PM_{10}	$PM_{2.5}$
S[a]	7.1	7.1
F[a]	0.6	0.031
Emission Factor (lb/mile)[b]	1.543	0.167
Control Efficiency for Watering 2x Daily[c]	55%	55%
Controlled Emission Factor (lb/mile)	0.694	0.075

[a] S and F taken from Section 4.4.1 of Appendix C of the *CalEEMod User's Guide* (ICF 2022).

[b] Emission factor calculated using the following equation from Section 4.4.1 of Appendix C of the *CalEEMod User's Guide* (ICF 2022):

PM_{10} Emission Factor (lb/VMT) = 0.051 x [S (mph)]$^{2.0}$ x F_{PM10}

$PM_{2.5}$ Emission Factor (lb/VMT) = 0.04 x [S (mph)]$^{2.5}$ x $F_{PM2.5}$

[c] Control efficiency for watering unpaved roads twice per day taken from the CalEEMod model.

Fugitive Dust Emissions from Paved and Unpaved Roads

Included in vehicle emissions.

Table A5.3-13. Construction Equipment Emission Factors

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase

OFFROAD Equipment Category	Fuel Type	Horsepower[a]	Load Factor[a]	Year[b]	Emission Factors (g/hp-hr)[c]										
					ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e[d]	CO_2	CH_4	N_2O	Controlled Nox[f]
Air Compressors	Diesel	37	0.48	2026	0.512	4.822	3.646	0.007	0.099	0.091	570.352	568.287	0.023	0.005	3.646
Bore/Drill Rigs	Diesel	83	0.50	2026	0.128	3.253	1.639	0.005	0.040	0.037	531.524	525.082	0.210	0.004	1.639
Chainsaws	Petrol/Gas[e]	1.86	0.70	2026	47.480	128.980	1.450	0.010	0.410	0.550	694.410	690.680	0.030	0.010	1.450
Chippers/Stump Grinders/Shredders Preempt	Petrol/Gas[e]	4.85	0.78	2026	15.900	278.240	2.110	0.010	0.010	0.010	647.750	644.020	0.030	0.010	2.110
Cranes	Diesel	367	0.29	2026	0.198	1.637	1.837	0.005	0.075	0.069	529.178	527.461	0.021	0.004	0.260
Excavators	Diesel	36	0.38	2026	0.393	4.221	3.407	0.005	0.099	0.091	589.119	587.029	0.024	0.005	3.407
Forklifts	Diesel	82	0.20	2026	0.246	3.579	2.342	0.005	0.112	0.103	528.814	527.097	0.021	0.004	2.342
Generator Sets	Diesel	14	0.74	2026	0.539	2.860	4.324	0.008	0.174	0.160	570.392	568.327	0.023	0.005	4.324
Graders	Diesel	148	0.41	2026	0.313	3.397	2.528	0.005	0.140	0.129	532.557	530.815	0.022	0.004	2.528
Leaf Blowers/Vacuums	Petrol/Gas[e]	1.79	0.94	2026	40.080	135.480	0.640	0.010	0.440	0.580	908.570	904.590	0.040	0.010	0.640
Off-Highway Trucks	Diesel	376	0.38	2026	0.176	1.178	1.011	0.005	0.036	0.033	530.885	529.168	0.021	0.004	0.260
Other Construction Equipment	Diesel	82	0.42	2026	0.282	3.504	2.734	0.005	0.158	0.145	529.258	527.541	0.021	0.004	2.734
Rollers	Diesel	36	0.38	2026	0.542	4.093	3.614	0.005	0.154	0.142	589.004	586.914	0.024	0.005	3.614
Rough Terrain Forklifts	Diesel	96	0.40	2026	0.115	3.220	1.643	0.005	0.033	0.030	530.606	528.889	0.021	0.004	1.643
Rubber Tired Dozers	Diesel	367	0.40	2026	0.353	2.726	3.223	0.005	0.142	0.131	534.292	532.550	0.022	0.004	3.223
Rubber Tired Loaders	Diesel	150	0.36	2026	0.211	3.293	1.398	0.005	0.073	0.067	528.132	526.415	0.021	0.004	1.398
Signal Boards	Diesel	6	0.82	2026	0.547	3.470	4.143	0.009	0.162	0.149	570.367	568.302	0.023	0.005	4.143
Skid Steer Loaders	Diesel	71	0.37	2026	0.134	3.245	1.807	0.005	0.051	0.047	530.338	528.621	0.021	0.004	1.807
Sweepers/Scrubbers	Diesel	36	0.46	2026	0.584	4.731	3.759	0.005	0.171	0.157	588.749	586.659	0.024	0.005	3.759
Tractors/Loaders/Backhoes	Diesel	84	0.37	2026	0.184	3.481	1.885	0.005	0.063	0.058	531.424	529.707	0.021	0.004	0.260
Trimmers/Edgers/Brush Cutters	Petrol/Gas[e]	1.74	0.91	2026	14.810	304.460	4.860	0.010	0.080	0.100	812.300	808.570	0.030	0.010	4.860
Welders	Diesel	46	0.45	2026	0.465	4.493	3.570	0.007	0.095	0.088	570.356	568.291	0.023	0.005	3.570

[a] Unless otherwise indicated, Horsepower and Load Factors taken from Table G-12 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[b] Construction emission factors conservatively based on the year construction activities begin (2026).

[c] Unless otherwise indicated, Emission Factors taken from Table G-11 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[d] CO_2e emissions were calculated using the following global warming potentials from 40 CFR Part 98, Table A-1:

CO_2 = 1

CH_4 = 25

N_2O = 298

[e] Gasoline-powered landscaping equipment (e.g., chainsaws, leaf blowers, trimmers/edgers/brush cutters) Horsepower and Load Factors taken from Table G-27 of Appendix G of the *CalEEMod User's Guide* (ICF 2022). Their Emission Factors taken from Table G-26 of Appendix G of the *CalEEMod User's Guide* (ICF 2022).

[f] Controlled NOx emission factors for the Cranes, Off-Highway Trucks, and Tractors/Loaders/Backhoes taken from Table G-13 of Appendix G of the *CalEEMod User's Guide* (ICF 2022), assuming these equipment would comply with the Tier 4 Final emissions standard. All other equipment assumed to be a mix of Tier 2/Tier 3 equipment, as represented by the default emission factors provided in Table G-11 or Table G-27 of Appendix G of the *CalEEMod User's Guide*

Table A5.3-14. Vehicle Emission Factors

PG&E Moraga-Oakland X 115 kV Rebuild Project

Construction Phase Emission Factors for 2026[a]

Vehicle Class	EMFAC Vehicle Types	Exhaust Emission Factors (g/mile)[b]							Paved Road Emission Factors (g/mile)[c]		Unpaved Road Emission Factors (g/mile)[c]		Controlled Unpaved Road Emission Factors (g/mile)[c]	
		ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2e	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Light-duty Auto/Truck	LDA, LDT1, LDT2	0.01	0.64	0.04	0.00	0.02	0.01	266.53	0.30	0.07	65.07	651.31	29.28	293.09
Heavy-duty Diesel	HHDT	0.02	0.08	1.80	0.02	0.14	0.06	1,659.19	0.30	0.07	65.07	651.31	29.28	293.09
Heavy-duty Truck	LHDT1, LHDT2	0.09	0.74	0.63	0.01	0.10	0.05	775.74	0.30	0.07	65.07	651.31	29.28	293.09
Medium-duty Diesel	MHDT	0.02	0.10	1.02	0.01	0.07	0.03	1,189.11	0.30	0.07	65.07	651.31	29.28	293.09
Light-duty Truck	LDT1, LDT2	0.01	0.76	0.06	0.00	0.02	0.01	321.14	0.30	0.07	65.07	651.31	29.28	293.09

[a] Construction emission factors conservatively based on the year construction activities begin (2026).

[b] Vehicle Emission Factors from EMFAC2021 for the Bay Area AQMD, calendar year 2026. Vehicle class category for various trucks was assigned based on the vehicle GVWR, per Appendix 4 of the *EMFAC2021 User's Guide* (CARB 2021).

[c] Paved and unpaved road emission factors calculated using CalEEMod methodology, as described below.

Derivation of Paved Road Emission Factors

Parameter[a]	PM_{10}	$PM_{2.5}$
Average Weight	2.4	2.4
k	1	0.25
sL	0.1	0.1
P[b]	9	9
Emission Factor (g/mile)[c]	**0.299**	**0.075**

[a] Except for P, all parameters taken from Section 5.1.4 of Appendix C of the *CalEEMod User's Guide* (ICF 2022).

[b] P taken from the CalEEMod model for a location in or around Piedmont, California.

[c] Emission factor calculated using methodology from Section 5.1.4 of Appendix C of the *CalEEMod User's Guide* (ICF 2022), as follows:
Emission Factor (g/mile) = k (g/mile) x [sL (g/m^2)]$^{0.91}$ x [Average Weight (tons)]$^{1.02}$ x [1 - P (days) / 1,460 days]

Unpaved Road Emission Factors

Parameter[a]	PM_{10}	$PM_{2.5}$
k	81.65	816.47
s	8.5	8.5
S	40	40
M	0.5	0.5
C	0.07	0.03
P[b]	9	9
Emission Factor (g/mile)[c]	**65.068**	**651.306**
Control Efficiency for Watering 2x Daily[d]	**55%**	**55%**
Controlled Emission Factor (g/mile)	**29.281**	**293.088**

[a] Unless otherwise noted, all parameters taken from Section 5.1.4 of Appendix C of the *CalEEMod User's Guide* (ICF 2022).

[b] P taken from the CalEEMod model for a location in or around Piedmont, California.

[c] Emission factor calculated using methodology from Section 5.1.4 of Appendix C of the *CalEEMod User's Guide* (ICF 2022), as follows:
Emission Factor (g/mile) = [({k (g/mile) x [s (%) / 12]^{1} x [S (miles/hr) / 30]$^{0.5}$ } / [M (%) / 0.5]$^{0.2}$) - C (g/mile)] x [1 - P (days) / 365 days]

[d] Control efficiency for watering unpaved roads twice per day taken from the CalEEMod model.

Table A5.3-15. Aircraft Emission Factors

PG&E Moraga-Oakland X 115 kV Rebuild Project

LTO and In-Flight Emission Factors

Aircraft Type	Aircraft Make/ Model	LTO Emission Factors (g/LTO)							In-Flight Emission Factors (kg/hr)						
		ROG[a]	CO[a]	Nox[a]	Sox[b]	PM_{10}[a]	$PM_{2.5}$[a]	CO_2[c]	ROG[a]	CO[a]	Nox[a]	Sox[b]	PM_{10}[a]	$PM_{2.5}$[a]	CO_2[c]
Light Ship	MD500	344.44	457.70	85.10	114.60	1.52	1.48	61,276.50	0.75	0.96	0.70	0.70	0.01	0.01	374.40
Medium Ship	407 Long Ranger/Jet	278.13	365.50	130.50	141.60	2.13	2.07	75,713.37	0.64	0.82	1.11	0.90	0.02	0.02	479.30
Medium Ship	UH-60 Blackhawk	554.33	724.90	575.30	438.00	8.55	8.35	234,198.12	1.08	1.32	5.43	3.05	0.01	0.01	1,628.48

[a] Emission Factors derived from data presented in Table 9 of the *Guidance on the Determination of Helicopter Emissions* (Rindlisbacher and Chabbey 2015), as shown below, using the following conversion factors:

Conversion of HC to VOC = 0.9708

Fraction of $PM_{2.5}$ in PM_{10} = 0.976

[b] SOx Emission Factors estimated assuming jet fuel is regulated to contain < 0.3% sulfur by weight and the following conversion factors:

Max Sulfur Content = 0.003

Ratio of Molecular Weights for SO_2 to S = 2

[c] CO_2 Emission Factors calculated using the following default parameters for jet fuel from 40 CFR Part 98, Table C-1:

Emission Factor = 72.22 kg CO_2/MMBtu

HHV = 0.135 MMBtu/gal

Density = 3.039 kg/gal

LTO and In-Flight Fuel Consumption and Emissions Data (Rindlisbacher and Chabbey 2015)

Aircraft Type	Aircraft Make/Model	LTO Fuel (kg)	LTO Emissions (g)				Hourly Fuel (kg)	Hourly Emissions (kg/hr)			
			NOx	HC	CO	PM		NOx	HC	CO	PM
Light Ship	MD500	19.1	85.10	354.80	457.70	3.00	116.7	0.70	0.77	0.96	0.02
Medium Ship	407 Long Ranger/Jet	23.6	130.50	286.50	365.50	4.20	149.4	1.11	0.66	0.82	0.03
Medium Ship	UH-60 Blackhawk	73	575.30	571.00	724.90	16.90	507.6	5.43	1.11	1.32	0.02

Table A5.8-16. GHG Emissions from SF6-Insulated Circuit Breakers

PG&E Moraga-Oakland X 115 kV Rebuild Project

Circuit Breaker Emissions

Equipment	Number of New Circuit Breakers	SF_6 Capacity per Breaker (lbs)	Leakage Rate[a]	SF_6 Emissions per Circuit Breaker (lbs/year)	Total SF_6 Emissions (lbs/year)	CO_2e Emissions (metric tons/year)[b, c]
SF_6 Circuit Breaker	2	132	0.5%	0.7	1.3	13.7

[a] It was conservatively assumed that the leakage rate would be 0.5% per APM GHG-2.

[b] CO_2e emissions were calculated using the following global warming potential from 40 CFR Part 98, Table A-1:

SF_6 = 22,800

[c] The following conversion factor was used to estimate emissions:

1 metric ton = 2,204.62 lb