Appendix E

Greenhouse Gas Emissions Technical Report

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GREENHOUSE GAS ENVIRONMENTAL IMPACT REPORT

BAYER CEQA LONG-RANGE DEVELOPMENT PROJECT BERKELEY, CALIFORNIA

RAMBOLL

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ACRONYMS AND ABBREVIATIONS

°C	Degree Celsius
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AEP	Association of Environmental Professionals
BAAQMD	Bay Area Air Quality Management District
BAU	Business-As-Usual
Bay Area Basin	San Francisco Bay Area Basin
CalEEMod®	California Emission Estimator Model
CAP	Criteria Air Pollutant
CARB	California Air Resources Board
CCE	Community Choice Energy
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CF_4	Perfluoromethane
CFC	Chlorinated Fluorocarbon
CH_4	Methane
CNRA	California Natural Resources Agency
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
DOT	Department of Transportation
EIR	Environmental Impact Report
EISA	Energy Independence and Security Act
EMFAC	EMission FACtor Model
GHG	Greenhouse Gas
GT	Billion Metric Tons
GWP	Global Warming Potential
HFC	Hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
Lb	Pound
LCFS	Low Carbon Fuel Standard

LFG	Landfill Gas
MMT	Million Metric Tons
mpg	Miles Per Gallon
MPO	Metropolitan Planning Organization
MT	Metric Tons
MTC	Metropolitan Transportation Commission
MWh	Megawatt-Hour
N_2O	Nitrous Oxide
NHTSA	National Highway Traffic Safety Administration
PG&E	Pacific Gas and Electric
ppb	Parts Per Billion
ppm	Parts Per Million
Ramboll	Ramboll US Consulting, Inc.
RFS	Renewable Fuel Standard
RPS	Renewables Portfolio Standard
RTP	Regional Transportation Plan
SB	Senate Bill
SCS	Sustainable Communities Strategy
SF_6	Sulfur Hexafluoride
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USEPA	United States Environmental Protection Agency
VMT	Vehicle Miles Travelled
ZEV	Zero-Emission Vehicle
ZNE	Zero Net Energy

1. INTRODUCTION

This Section discusses the existing conditions in the project area, presents the regulatory framework for greenhouse gas (GHG) management, and analyzes the potential for the Proposed Project to affect global climate conditions from activities that emit GHGs. It also analyzes the types and quantities of emissions that would be generated both on a one-time basis from proposed construction activities and over the long term from operation of the Proposed Project. The analysis determines whether those emissions have the potential for the Project to result in significant adverse environmental impacts from GHG emissions and identifies feasible mitigation measures for significant adverse impacts, if required. Emissions of criteria air pollutants (CAP) and toxic air contaminants and potential impacts on local and regional air quality are discussed in the Air Quality (AQ) chapter of the Environmental Impact Report (EIR). The Proposed Project's energy usage characteristics are discussed in the Energy Analysis Report in order to determine whether the Project could result in any significant energy-related environmental impacts during its construction or operation activities.

The analysis is based on a review of existing climate conditions in the Bay Area region and globally and climate regulations and targets set by the United States Environmental Protection Agency (USEPA), the California Air Resources Board (CARB), and the Bay Area Air Quality Management District (BAAQMD). This analysis includes methodologies identified in BAAQMD's updated CEQA Air Quality Guidelines[1] and its companion documentation. Calculations were prepared to quantitatively assess the GHG contributions of the Proposed Project (see tables within **Air Quality Appendices A** and **B** and **GHG Appendix A** as referenced in more detail below); this information forms the basis of much of the assessment of climate impacts presented here.

The project development is expected to occur in two phases: an initial 10-year phase that is complete in Year 10 (2032 – the "Year 10 Project") followed by a 20-year phase that is complete in Year 30 (2052 – the "Year 30 Project").

The climate impact methodologies and approaches to the analysis (described under "Approach to Analysis") are based on these two phases of the Project analyzed in Year 10 and Year 30. Construction for the first phase of the Project (Year 10 Project) would occur in years 2024 and 2029 and the construction for the second phase of the project (Year 30 Project) would occur in years 2034 and 2049 (see Project Descriptions submitted to the City of Berkeley on October 14th, 2020 for a detailed discussion of Project phasing). All the demolition activities will take place as a part of Year 10 Project in 2024. The operational impacts for the Year 10 and Year 30 analyses are conservatively analysed in the first year of buildout after the main phase of construction ends (i.e. 2025 for Year 10 Project and 2035 for Year 30 Project). Further details on the climate impact methodologies and approaches to the analyses are presented below.

[1] Bay Area Air Quality Management District (BAAQMD), CEQA Air Quality Guidelines, updated May 2017, http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed October 13, 2020

2. GHG SCIENTIFIC BACKGROUND AND REGULATORY OVERVIEW

2.1 GHG Scientific Background

There is international scientific consensus that anthropogenic emissions of GHGs[2] have and will continue to contribute to changes in the global climate. Although there is uncertainty concerning the magnitude, rate, and ultimate effects of this change, it is generally accepted that climate change will result in a substantial adverse environmental impacts.

Climate change is the cumulative effect of all natural and anthropogenic sources of GHGs on a global scale. The GHG emissions from an individual project, even a very large development project, would not individually generate sufficient GHG emissions to measurably influence global climate change.[3] Consideration of a project's climate change impact, therefore, is essentially an analysis of a project's contribution to a cumulatively significant global impact through its emission of GHGs. While it is possible to examine the quantity of GHGs that would be emitted from individual project sources, it is not currently possible to link these GHGs emitted from a specific source or location to particular global climate changes.

The State of California, through Assembly Bill (AB) 32, Senate Bill (SB) 32, Executive Order (EO) S-3-05, EO B-30-15, and EO B-55-18 has set state-wide targets for the reduction of GHG emissions. The goals are to reduce future GHG emissions in a state that is expected to experience rapid growth in population and economic output.

2.1.1 Global Setting

This section describes the status of global science on climate change and the scientific consensus regarding the role of anthropogenic GHG emissions in contributing to climate change and global warming. This section also describes global-scale estimates of GHG trends and projected effects on climate.

2.1.1.1 Global Climate Change

Global warming and global climate change are both terms that describe changes in the earth's climate. Global climate change is a broad term used to describe any worldwide, long-term change in the earth's climate. This change could be, for example, an increase or decrease in temperatures, the start or end of an ice age, or a shift in precipitation patterns. The term global warming is more specific than global climate change and refers to a general increase in temperatures across the earth. Though global warming is characterized by rising temperatures, it can cause other climatic changes, such as a shift in the frequency and intensity of rainfall or hurricanes. Global warming does not necessarily imply that all locations will be warmer. Some specific, unique locations may be cooler even though the

[2] For the purposes of this analysis, the term "GHGs" refers to carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride, those gases regulated under California AB 32 and the Kyoto Protocol of the United Nations Framework Convention on Climate Change. Although the State of California also declared nitrogen trifluoride a GHG, there is no nitrogen trifluoride associated with this project. Therefore, nitrogen trifluoride will not be further considered.

[3] California Office of Planning and Research (OPR). 2016. Technical Advisory. CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review. June 19. Available at: http://opr.ca.gov/docs/june08-ceqa.pdf. Accessed October 13, 2020.

world, on average, is warmer. All of these changes fit under the umbrella of global climate change.[4]

While global warming can be caused by natural processes, there is a general scientific consensus that most current global warming is the result of human activity on the planet.[5] This human-made, or anthropogenic, warming is primarily caused by increased emissions of GHGs that keep the earth's surface warm. This is called "the greenhouse effect." The greenhouse effect and the role that GHGs play in it are described below.

2.1.1.2 The Greenhouse Effect

Greenhouses allow sunlight to enter, and then they capture some of the heat generated by the sunlight. Similarly, the earth's atmosphere acts like a greenhouse by retaining some of the heat that is generated by the sun. When solar radiation from the sun reaches the earth, much of it penetrates the atmosphere to ultimately reach the earth's surface; this solar radiation is absorbed by the earth's surface and then re-emitted as heat in the form of infrared radiation.[6] The warming potential of GHGs does not come from the absorption of solar radiation but from the absorption of infrared radiation. When the infrared radiation is absorbed by the molecules of GHGs, it is re-radiated in all directions. A portion of the infrared radiation is emitted back toward the surface of the earth, in effect "trapping" the heat in the atmosphere.[7] This phenomenon is referred to as the "greenhouse effect."

The earth's greenhouse effect has existed far longer than humans have and has played a key role in the development of life. Concentrations of major GHGs, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and water vapor, have been naturally present for millennia at relatively stable levels in the atmosphere, maintaining hospitable temperatures on the surface of the earth. Without these GHGs, the earth's temperature would be too cold for life to exist.

In the absence of major industrial human activity, natural processes have maintained atmospheric concentrations of GHGs, and, therefore, global temperatures at constant levels over the last several centuries.[8] As human industrial activity has increased, atmospheric concentrations of certain GHGs have grown dramatically. Concentrations of CO_2 and CH_4 over the past 10,000 years has increased, particularly dramatically since the Industrial Revolution. As the concentrations of GHGs increase due to human activity, more infrared radiation is reflected back toward the earth, subsequently heating the surface of the earth to higher temperatures. This is the process that is described as human-induced global warming.

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[4] Other definitions of "greenhouse effect" and "global warming" can be found on Merriam-Webster online at http://www.m-w.com/. A definition for "climate change" can be found at http://dictionary.reference.com, which uses Webster's New Millennium™ Dictionary of English, Preview Edition (v 0.9.6). (Websites accessed October 13, 2020.)

[5] IPCC. 2007. *Summary for Policymakers.* In: *Climate Change 2007: The Physical Science Basis*. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf. Accessed: October 13, 2020.

[6] All light, be it visible, ultraviolet, or infrared, carries energy.

[7] Infrared radiation is characterized by longer wavelengths than solar radiation. GHGs reflect radiation with longer wavelengths. As a result, instead of escaping back into space, GHGs reflect much infrared radiation (i.e., heat) back to the earth.

[8] Examples of natural processes include the addition of GHGs to the atmosphere from respiration, fires, and decomposition of organic matter. The removal of GHGs is mainly from plant and algae growth and absorption by the ocean.

In 2013, the Intergovernmental Panel on Climate Change (IPCC) began releasing components of its Fifth Assessment Report,[9] providing a comprehensive assessment of climate change science. The Fifth Assessment Report states that there is a scientific consensus that the global increases in GHGs since 1750 are mainly due to human activities such as fossil fuel use, land use change (e.g., deforestation), and agriculture. In addition, the report states that it is likely that these changes in GHG concentrations have contributed to global warming. Confidence levels of claims in this report have increased since the release of the Third and Fourth Assessment Reports due to the large number of simulations run and the broad range of available climate models.[10]

2.1.1.3 GHGs and GHG Emission Sources

The term "greenhouse gases" includes gases that are emitted from natural processes, such as forest fires, and anaerobic degradation, as well as man-made fossil fuel combustion, such as CO_2, CH_4, N_2O, and water vapor, as well as gases that are only human-made and that are emitted through the use of modern industrial products, such as hydrofluorocarbons (HFCs), chlorinated fluorocarbons (CFCs), and sulfur hexafluoride (SF_6). These last three families of gases, while not naturally present in the atmosphere, have properties similar to the naturally occurring GHGs that also cause them to trap infrared radiation when they are present in the atmosphere, thus making them GHGs. These six gases comprise the major GHGs that are recognized by the Kyoto Protocol (water vapor is not included).[11] A seventh gas, nitrogen trifluoride, was also recognized by CARB as a GHG.[12] There are other GHGs that are not recognized by the Kyoto Protocol or CARB, due to either the smaller role that they play in climate change or the uncertainties surrounding their effects. Atmospheric water vapor is not recognized by the Kyoto Protocol or CARB because there is not an obvious correlation between atmospheric water vapor concentrations and specific human activities. Atmospheric water vapor appears to act in a positive feedback manner; higher temperatures lead to higher atmospheric water vapor concentrations, which in turn cause more global warming.[13]

The effect each GHG has on global warming is a combination of the volume of its emissions and its global warming potential (GWP). GWP indicates, on a pound (lb)-for-pound basis, how much a gas will contribute to global warming relative to how much warming would be caused by the same mass of CO_2. CH_4 and N_2O are substantially more potent than CO_2, with GWPs of 25 and 298,[14] respectively. However, these GHGs are nowhere near as potent as synthetic chemicals such as SF_6 and perfluoromethane (CF_4), which have GWPs of 22,800 and 7,390, respectively, compared to a GWP of 1 for CO_2.[15]

[9] IPCC. 2014. Fifth Assessment Report. Climate Change 2014: Working Groups I, II, and III Reports. Available at: http://www.ipcc.ch/report/ar5/syr/ Accessed October 13, 2020.

[10] IPCC. 2001. Third Assessment Report. Available at: https://www.ipcc.ch/reports/?rp=ar3. Accessed: October 13, 2020.

[11] The Kyoto Protocol sets legally binding targets and timetables for cutting the GHG emissions of industrialized countries. The U.S. has not approved the Kyoto Protocol.

[12] Senate Bill 104, which directs CARB to regulate nitrogen trifluoride and possibly other gases found to be at least as harmful as CO_2 was signed into law by Governor Schwarzenegger in October 2009.

[13] IPCC. 2001. Third Assessment Report. Available at: https://www.ipcc.ch/reports/?rp=ar3. Accessed: October 13, 2020.

[14] These GWPs are from the IPCC's Fourth Assessment Report.

[15] Fourth Assessment Report.

GHG emissions are typically measured in terms of mass of carbon dioxide equivalent (CO_2e). CO_2e is calculated as the product of the mass of a given GHG and its specific GWP.

The most important GHG in human-induced global warming is CO_2. While many gases have much higher GWPs than the simple GHGs, CO_2 is emitted in such vastly higher quantities that it accounts for 81% of the GWP of all GHGs emitted by the United States (US).[16] Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions and thus substantially increases in atmospheric CO_2 concentrations. The most recent measurements of atmospheric CO_2 concentrations are about 411 parts per million (ppm) for 2020, around 47% higher than the pre-industrial concentrations of about 280 ppm.[17,18] In addition to the sheer increase in the volume of its emissions, CO_2 is a major factor in human-induced global warming because of its lifespan in the atmosphere of 50 to 200 years.

Concentrations of the second most prominent GHG, CH_4, have also increased due to human activities such as rice production, degradation of waste in landfills, cattle farming, and natural gas mining. Present levels of atmospheric CH_4 are more than double pre-industrial levels, up to 1,872 parts per billion (ppb) as compared to 715 ppb.[19,20] CH_4 has a relatively short atmospheric lifespan of only 12 years but has a higher GWP than CO_2.

N_2O concentrations increased from about 270 ppb in pre-industrial times to about 333 ppb by 2020.[21,22] Most of this increase can be attributed to agricultural practices (such as soil and manure management), as well as fossil-fuel combustion and the production of some acids. N_2O's 120-year atmospheric lifespan increases its role in global warming.

Besides CO_2, CH_4, and N_2O, there are several gases and categories of gases that were not present in the atmosphere in pre-industrial times but now exist and contribute to warming. These include CFCs, used often as refrigerants, and their more stratospheric-ozone-friendly replacements, HFCs. Fully fluorinated species, such as SF_6 and CF_4, are present in the atmosphere in relatively small concentrations but have extremely long life spans of 50,000 and 3,200 years each, making them potent GHGs.

2.1.1.4 Current and Projected Climatic Impacts of Global Warming

A strong indication that anthropogenic global warming is currently taking place is the fact that nine of the top ten warmest years since 1880 have occurred since 2005, with 2016 as

[16] USEPA. 2020. Inventory of U.S. GHG Emissions and Sinks: 1990-2018. Available at: https://www3.epa.gov/climatechange/ghgemissions/usinventoryreport.html. Accessed October 13, 2020.

[17] NOAA Global Monitoring Laboratory. 2020. Global Monthly Mean CO2. Available at: https://www.esrl.noaa.gov/gmd/ccgg/trends/global.html#global. Accessed October 13, 2020.

[18] IPCC. 2007. *Summary for Policymakers.* In: *Climate Change 2007: The Physical Science Basis.* Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf. Accessed October 13, 2020.

[19] NOAA Global Monitoring Laboratory. 2020. Global Monthly Mean CH4. Available at: https://www.esrl.noaa.gov/gmd/ccgg/trends_ch4/. Accessed October 13, 2020.

[20] IPCC. 2007. *Summary for Policymakers.* In: *Climate Change 2007: The Physical Science Basis.* Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf. Accessed October 13, 2020.

[21] IPCC. 2007. *Summary for Policymakers.* In: *Climate Change 2007: The Physical Science Basis.* Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf. Accessed October 13, 2020.

[22] NOAA Global Monitoring Laboratory. 2020. Global N2O Monthly Means. Available at: https://www.esrl.noaa.gov/gmd/ccgg/trends_n2o/. Accessed October 13, 2020.

the hottest year on record.[23] According to the Intergovernmental Panel on Climate Change, "human activities are estimated to have caused approximately 1 degree Celsius °C of global warming above pre-industrial levels" as of 2017.[24] It is currently accepted that warming of 1.5°C above pre-industrial levels by 2100 represents a threshold for significant global impacts due to warming; currently accepted climate models indicate that this threshold will be far surpassed under current emissions levels.

There is scientific consensus that global climate change will increase the frequency of heat extremes, heat waves, and heavy precipitation events. Other likely direct effects include an increase in the areas affected by drought and by floods, an increase in tropical cyclone activity, a rise in sea level, and recession of polar ice caps. The impacts of global warming have already been demonstrated by substantial ice loss in the Arctic.[25, 26] Scenarios for 2100 modeled in the IPCC's Fifth Assessment Report include the following:[27]

Temperature Increase by 2100

- Low Emissions Scenario: 1.1°C to 2.6°C
- High Emissions Scenario: 2.5°C to 7.8°C

Sea Level Rise by 2100

- Low Emissions Scenario: 0.26 to 0.55 meters (range)
- High Emissions Scenario: 0.45 to 0.82 meters (range)

2.1.2 United States Setting

In 2018, the US emitted about 6.7 billion metric tons (gross emissions) of CO_2e. This represents a 3.7 percent increase since 1990, and a 10.2 percent reduction below peak levels in 2005. Of the six economic sectors - residential, commercial, industrial, transportation, electric power, and agriculture - transportation accounted for the highest fraction of GHG emissions in 2018 (approximately 28 percent). Of the transportation-related emissions, 6.9 percent were from commercial aircraft and 2.4 percent from other aircraft.

[23] NOAA National Centers for Environmental Information. 2020. State of the Climate: Global Climate Report for Annual 2019. Available at: https://www.ncdc.noaa.gov/sotc/global/201913. Accessed October 14, 2020.

[24] IPCC. 2018. Special Report: Global Warming of 1.5*C. Summary for Policymakers. Available at: https://www.ipcc.ch/sr15/chapter/chapter-1/. Accessed: October 13, 2020.

[25] IPCC. 2007. *Summary for Policymakers.* In: *Climate Change 2007: The Physical Science Basis.* Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf. Accessed October 13, 2020.

[26] IPCC. 2007c. Summary for Policymakers. In: Climate Change 2007: Impacts, Adaption and Vulnerability. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4_wg2_full_report.pdf. Accessed October 13, 2020.

[27] Future GHG emissions are the product of very complex dynamic systems, determined by driving forces such as demographic development, socio-economic development, and technological change. Their future evolution is highly uncertain. Scenarios are alternative images of how the future might unfold and are an appropriate tool with which to analyze how driving forces may influence future emission outcomes and to assess the associated uncertainties. They assist in climate change analysis, including climate modeling and the assessment of impacts, adaptation, and mitigation. The possibility that any single emissions path will occur as described in scenarios is highly uncertain. More information on the IPCC's selection of scenarios is available at: IPCC, 2014. https://ar5-syr.ipcc.ch/topic_summary.php. Accessed October 13, 2020.

The majority of transportation emissions were from passenger cars (41.2 percent); freight trucks (23.3 percent), and light-duty trucks (17.5 percent).[28]

According to the 2016 U.S. Climate Action Report,[29] from 2005 to 2013, transportation emissions dropped by 9 percent due, in part, to increased fuel efficiency across the U.S. vehicle fleet and efficiency in the domestic aviation system. However, from 1990 to 2018, transportation emissions rose, principally because of increased demand for travel as a result of a confluence of factors including population growth, economic growth, urban sprawl, and periods of low fuel prices.[30]

According to the Climate Analysis Indicators Tool (CAIT) Emissions, global GHG emission totalled approximately 47.7 billion metric tons (GT) CO_2e in 2016.[31] The top 10 emitting countries in 2016 were as follows:

- China – 11.6 GT CO_2e
- US – 5.8 GT CO_2e[32]
- India – 3.2 GT CO_2e
- Russian Federation – 2.4 GT CO_2e
- Indonesia – 2.2 GT CO_2e
- Brazil – 1.4 GT CO_2e
- Japan – 1.3 GT CO_2e
- Iran – 0.9 GT CO_2e
- Germany – 0.8 GT CO_2e
- Canada – 0.8 GT CO_2e

In 2018, CO_2e emissions from industrialized countries reporting their inventories to the United Nations Framework Convention on Climate Change (UNFCCC) were as follows:[33]

- US – 6.7 GT CO_2e
- European Union (27 members) – 4.2 GT CO_2e

[28] USEPA. 2020. Inventory of U.S. Greenhouse Gas Emissions and Sinks. Available at: https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf. Accessed October 13, 2020.

[29] United States. 2016. 2016 Climate Action Report: Second Biennial Report of the United States of America Under the United Nations Framework Convention on Climate Change.

[30] USEPA. 2020. Inventory of U.S. Greenhouse Gas Emissions and Sinks. Available at: https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf. Accessed October 13, 2020.

[31] Climate Watch. 2020. Global Historical Emissions. CAIT data. Available at: https://www.climatewatchdata.org/ghg-emissions?breakBy=countries&end_year=2016&regions=WORLD&source=CAIT&start_year=1990. Accessed October 13, 2020.

[32] Differences between USEPA value and CAIT values may be due to differences in sources and methodology used by the two organizations in addition to the different years.

[33] UNFCCC. 2020. *Time Series Annex I: GHG Total Excluding Land Use, Land-Use Change and Forestry.* Available at: https://di.unfccc.int/time_series. Accessed October 13, 2020.

- Russian Federation – 2.2 GT CO_2e
- Japan – 1.2 GT CO_2e
- Canada – 0.73 GT CO2e

2.1.3 California Setting

In 2018, California emitted approximately 425 million metric tons of CO_2e, or about 7 percent of the U.S. emissions. Of these emissions, approximately 40 percent were attributed to the transportation sector, including direct emissions from vehicle tailpipe, off-road transportation mobile sources, intrastate aviation, rail, and watercraft.[34] California's percentage contribution to overall U.S. emissions is due primarily to the sheer size of California compared to other states, as California has among the lowest per capita GHG emission rates in the country, due to the success of its energy efficiency and renewable energy programs and other commitments that have lowered the State's GHG emissions rate of growth by more than half of what it would have been otherwise. Another factor that has reduced California's fuel use and GHG emissions is its mild climate compared to that of many other states.

The largest contributor to California's 2018 GHG emissions inventory was the transportation sector at 40 percent, followed by industrial sources at 21 percent, electricity generation (both in-state and out-of-state) at 15 percent, and commercial and residential sources at 10 percent. Agriculture, high GWP sources (including the release of ozone depleting substances, losses from the electricity transmission and distribution system, and gases from semiconductor manufacturing processes), and the recycling and waste sectors made up the remainder of the inventory.[35]

2.1.4 Bay Area Setting

BAAQMD published an updated inventory of GHG emissions in the San Francisco Bay Area Air Basin (Bay Area Basin) as part of the 2017 Clear Air Plan, based on the 2015 inventory year. Total GHG emissions within the Bay Area Basin in 2015 were estimated as 85 million metric tons (MMT) CO_2e based on 100 year GWP. In the nine county San Francisco Bay Area, GHG emissions from the transportation sector represent the largest source of the Bay Area's GHG emissions in 2015 at 41 percent, followed by the stationary industrial sources at 26 percent, electricity generation and co-generation at 14 percent, and fuel use (primarily natural gas) by building at 10 percent. The remaining 8 percent of emissions is comprised of fluorinated gas emissions and emissions from solid waste and agriculture. Of the total transportation emissions in 2015, on-road sources accounted for approximately 87 percent, while off-road sources accounted for the remainder.[36]

To reduce future GHG emissions associated with Projects in the nine-county BAAQMD area, BAAQMD published the California Environmental Quality Act (CEQA) Guidelines, which were

[34] ARB. 2020. California Greenhouse Gas Emissions for 2000-2018 – Trends of Emissions and Other Indicators. Available at: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf. Accessed November 17, 2020.

[35] Ibid.

[36] BAAQMD Clean Air Plan. Adopted April 19, 2017. Available at: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed October 13, 2020.

updated in May of 2017.[37] While these guidelines cover projects where BAAQMD is the Lead Agency, many local land use agencies have also adopted these guidelines. BAAQMD CEQA Guidelines suggest adopting a climate action plan that includes both a GHG emission inventory and a forecast of future emissions. In accordance with the BAAQMD CEQA Guidelines, BAAQMD has created a forecast of GHG emissions through 2020 by applying sector-specific growth factors to the baseline year emissions. The BAAQMD GHG Plan Level Guidance document identifies specific growth metrics and data sources for the various sectors including residential, commercial, industrial, transportation, waste, water treatment, and agriculture. BAAQMD projects that GHG emissions will increase to approximately 94.8 MMT CO_2e per year by 2029 if current trends continue without mitigation.[38]

2.1.5 Alameda County Setting

In 2015, BAAQMD prepared GHG inventories for each of the nine Bay Area Counties.[39] In this report, annual GHG emissions of Alameda County for basis year 2011 were listed as 13.2 MMT CO_2e.

2.1.6 City of Berkeley Setting

In 2006 Berkeley voter approved ballot Measure G which put forth a mandate to reduce the community's GHG emissions by 80% below 2000 levels by 2050. In 2009, the City of Berkeley adopted the Climate Action Plan written through a community-wide process to meet this goal. Based on the emissions inventory included in this plan, which was based on emissions for year 2005, in 2005 Berkeley emitted 576,000 metric tons (MT) CO_2e. Gasoline and transportation accounted for 29% of these emissions, while diesel use for transportation contributed 17%. Natural gas use in residences contribute to 19% of total emissions, while commercial natural gas use contributes 17% of emissions. The remaining emissions are attributable to electricity use (11% for commercial use and 7% for residential use).[40]

2.1.7 Climate Change Effects

2.1.7.1 Potential Effects of Climate Change on State of California

According to the CARB, some of the potential impacts in California of global warming may include loss in snowpack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years.[41] The California Climate Change Center (CCCC) has released four assessment reports on climate change in California, the most recent in 2019.[42] Per California's Fourth Climate Change Assessment, by 2050, the

[37] BAAQMD. 2017. California Environmental Quality Act Air Quality Guidelines. Available at: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed October 12,2020. Note that the guidelines are currently undergoing updates.

[38] Source Inventory of Bay Area GHG Emissions: Base Year 2011. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/emission-inventory/by2011_ghgsummary.pdf. Accessed October 9, 2020.

[39] Source Inventory of Bay Area GHG Emissions: Base Year 2011. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/emission-inventory/by2011_ghgsummary.pdf. Accessed October 9, 2020.

[40] City of Berkeley Climate Action Plan. Published June 2009. Available at: https://www.cityofberkeley.info/climate/. Accessed October 9, 2020.

[41] California Air Resources Board (CARB). 2006. Public Workshop to Discuss Establishing the 1990 Emissions Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions, Sacramento, CA. December 1.

[42] California Climate Change Center (CCCC). 2019. California's Fourth Climate Change Assessment. Available at: http://www.climateassessment.ca.gov/. Accessed: October 13, 2020.

statewide average annual maximum daily temperature is projected to warm by approximately 5.6 to 8.8°F above 2000 averages.[43]

Below is a summary of some of the potential effects reported in an array of studies that could be experienced in California as a result of global warming and climate change.

2.1.7.2 Air Quality

Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. For other pollutants, the effects of climate change and/or weather are less well studied, and even less well understood. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. Studies have been conducted to evaluate the potential impacts of climate change on wildfire frequency based on lower and higher emissions scenarios. Per California's Fourth Climate Change Assessment, under a higher emissions scenario, the average area burned statewide could increase by 77 percent above historic levels by 2100.[44] Per California's Third Climate Change Assessment, the estimated burned area is projected to increase between 57 and 169 percent, depending on location. To emphasize that, 2017, 2018 and 2020 have been among the top five years since 1987 in acres burned in California.[45] However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the State.[46] It is estimated that over the next decade, higher temperatures could increase the demand for electricity by 1 Gigawatt (GW) during summer months, which would require purchase of costly peak power from external sources or the construction of one new large power plant in California.[47] During periods of extreme heat, efficiency of electricity generation is reduced at natural gas plants; hydropower generation is reduced; and increased losses occur at substations; all while electricity demands are increased. These factors are projected to result in the need for more than 17 GW, or 38 percent of additional capacity, needed by 2100. Additionally, transmission lines lose 7 to 8 percent of transmitting capacity in higher temperatures, which also results in a need for increased power generation.[48] This additional predicted need for electricity does not include the additional demand that will result from the electrification of the transportation system.

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[43] CCCC. 2019. California's Fourth Climate Change Assessment. Key Findings. Available at: http://www.climateassessment.ca.gov/state/overview/. Accessed: October 13, 2020.

[44] Ibid.

[45] CalFire. 2020. California Wildfires and Acres for All Jurisdictions. Available at: https://www.fire.ca.gov/media/11397/fires-acres-all-agencies-thru-2018.pdf. Accessed: October 13, 2020.

[46] California Climate Change Center (CCCC). 2006. Our Changing Climate: Assessing the Risks to California, CEC500-2006-077, Sacramento, CA. July. Available at: https://www.engr.scu.edu/~emaurer/papers/CEC-500-2006-077.pdf. Accessed: October 13, 2020.

[47] California Climate Change Center. 2012. Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California. CEC-500-2012-007. July 2012.

[48] Ibid.

2.1.7.3 Water Supply

Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. For example, models that predict drier conditions suggest decreased reservoir inflows and storage, and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions project increased reservoir inflows and storage, and increased river flows.[49]

A July 2006 technical report prepared by the California Department of Water Resources (DWR) addresses the State Water Project, the Central Valley Project, and the Sacramento-San Joaquin Delta. Although the report projects that, "[c]limate change will likely have a significant effect on California's future water resources … [and] future water demand," it also reports that, "there is much uncertainty about future water demand, especially those aspects of future demand that will be directly affected by climate change and warming. While climate change is expected to continue through at least the end of this century, the magnitude and, in some cases, the nature of future changes is uncertain. This uncertainty serves to complicate the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood,"[50] DWR adds that "[i]t is unlikely that this level of uncertainty will diminish significantly in the foreseeable future."[51] Still, changes in water supply are expected to occur, and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows.[52]

California's Third Climate Change Assessment outlines the state's urgent water management challenges brought on as a result of climate change. These include increasing demand from a growing population as temperatures rise, earlier snowmelt and runoff, and faster-than-historical sea-level rise threatening aging coastal water infrastructure and levees in the Sacramento-San Joaquin Delta.[53] Additionally, they predict that competition between urban and agriculture water users and environmental needs will increase due to effects on water supply and stream flows. The Fourth Climate Change Assessment concludes that by 2100, water supply from snowpack is projected to decline by two-thirds, and that by 2050, California's agricultural production could face climate-related water shortages of up to 16 percent in certain regions.[54]

2.1.7.4 Hydrology

As discussed above, climate change could potentially affect the following: the amount of snowfall, rainfall and snowpack; the intensity and frequency of storms; flood hydrographs

[49] Brekke, L.D., et al. 2004. —Climate Change Impacts Uncertainty for Water Resources in the San Joaquin River Basin, California. ‖ Journal of the American Water Resources Association. 40(2): 149–164. Malden, MA, Blackwell Synergy for AWRA.

[50] California Department of Water Resources (DWR). 2006. Progress on Incorporating Climate Change into Management of California Water Resources, Sacramento, CA. July.

[51] California Department of Water Resources (DWR). 2006. Progress on Incorporating Climate Change into Management of California Water Resources, Sacramento, CA. July.

[52] Kiparsky 2003, op. cit; DWR, 2005, op. cit.; Cayan, D., et al, 2006. Scenarios of Climate Change in California: An Overview (White Paper, CEC-500-2005-203-SF), Sacramento, CA. February.

[53] California Climate Change Center, 2012. Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California. CEC-500-2012-007. July 2012.

[54] CCCC. 2019. California's Fourth Climate Change Assessment. Key Findings. Available at: http://www.climateassessment.ca.gov/state/overview/. Accessed October 13, 2020.

(flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes -- expansion of sea water as the oceans warm and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could also jeopardize California's water supply. In particular, saltwater intrusion would threaten the quality and reliability of the state's major fresh water supply that is pumped from the southern portion of the Sacramento/San Joaquin River Delta. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events. Assuming the rate of sea level rise continues to follow global trends, sea level along California's coastline in 2050 could be 10-18 inches higher than in 2000, and 31-55 inches higher by the end of this century.[55] Based on these current projections, the current 100-year storm could occur once every year. California's Fourth Climate Assessment projects that without implementation of protective measures, major airports will be susceptible to major flooding from a combination of sea-level rise and storm surge by years 2040 to 2080 and that the miles of highways susceptible to coastal flooding from a 100-year storm will triple from current levels by 2100.[56]

2.1.7.5 Agriculture

California has a $30 billion agricultural industry that produces half the country's fruits and vegetables. The CCCC notes that higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase, crop-yield could be threatened by a less reliable water supply, and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year that certain crops, such as wine grapes, bloom or ripen, and thus affect their quality.[57]

2.1.7.6 Ecosystems and Wildlife

Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. In 2004, the Pew Center on Global Climate Change released a report examining the possible impacts of climate change on ecosystems and wildlife.[58] The report outlines four major ways in which it is thought that climate change could affect plants and animals: (1) timing of ecological events, (2) geographic range, (3) species' composition within communities, and (4) ecosystem processes such as carbon cycling and storage.

2.2 Regulatory Overview

2.2.1 Federal Provisions

Although the US is not a party to the Kyoto Protocol, in 2002, President George W. Bush set a national policy goal of reducing the GHG emission intensity (tons of GHG emissions per

[55] Ibid.

[56] CCCC. 2019. California's Fourth Climate Change Assessment. Key Findings. Available at: http://www.climateassessment.ca.gov/state/overview/. Accessed October 13, 2020.

[57] California Climate Change Center (CCCC). 2006. op. cit.

[58] Parmesan, C. and H. Galbraith. Observed Impacts of Global Climate Change in the U.S., Arlington, VA: Pew Center on Global Climate Change. November 2004.

million dollars of gross domestic product) of the US economy by 18% by 2012.[59] The goal did not establish binding reduction mandates. Rather, the USEPA began to administer a variety of voluntary programs and partnerships with industries that produce and use synthetic gases to reduce emissions of particularly potent GHGs.

In 2015, the US State Department submitted the nation's GHG emissions reduction target to the UNFCCC. The submission, referred to as Intended Nationally Determined Contribution, is a formal statement of the US target to reduce the nation's emissions by 26 to 28 percent below 2005 levels by 2025. As of November 4, 2020, the US has withdrawn from the Paris Agreement which bound the US to these guidelines. At the time of writing, President-elect Joe Biden has committed to re-joining the Paris Agreement within his first 100 days of office.[60]

The emissions reduction target is the culmination of a process that examined opportunities under existing regulatory authorities to reduce GHG emissions in 2025 from all sources in all economic sectors. Several US laws, as well as existing and proposed regulations, are relevant to the implementation of the US target, including the Clean Air Act (42 U.S.C. § 7401 et seq.), the Energy Policy Act (42 U.S.C. § 13201 et seq.), and the Energy Independence and Security Act (42 U.S.C. § 17001 et seq).[61]

2.2.1.1 Massachusetts v. EPA

In April 2007, in Massachusetts v. EPA, the U.S. Supreme Court directed the Administrator of the USEPA to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the USEPA Administrator was directed to follow the language of Section 202(a) of the Clean Air Act (CAA). In December 2009, the Administrator signed a final rule with two distinct findings regarding GHGs under Section 202(a) of the CAA:

- Elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, perfluorocarbons (PFCs), and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the "endangerment finding."
- The combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is referred to as the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the CAA. By regulating the emissions of GHGs from new motor vehicles, energy conservation benefits typically result through increased engine efficiency and the reduced consumption of petroleum-based fuels (e.g., gasoline).

[59] NOAA. 2002. President Announces Clear Skies and Global Climate Change Initiative, February. http://georgewbush-whitehouse.archives.gov/news/releases/2002/02/20020214-5.html. Accessed October 13, 2020.

[60] NPR. 2020. U.S. Officially Leaving Paris Climate Agreement, November. https://www.npr.org/2020/11/03/930312701/u-s-officially-leaving-paris-climate-agreement. Accessed December 2, 2020.

[61] The White House, FACT SHEET: U.S. Reports its 2025 Emissions Target to the UNFCCC (May 2015). https://www.whitehouse.gov/the-press-office/2015/03/31/fact-sheet-us-reports-its-2025-emissions-target-unfccc. Accessed October 13, 2020

2.2.1.2 Federal Vehicle Standards

In response to the *Massachusetts v. EPA* decision discussed above, in 2007, President Bush directed the USEPA, the Department of Transportation (DOT), and the Department of Energy (DOE) to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the National Highway Traffic Safety Administration (NHTSA) issued a final rule regulating fuel efficiency for and GHG emissions from cars and light-duty trucks for model year 2011; and, in 2010, the USEPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Obama issued a memorandum directing the same federal agencies to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the USEPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model year 2017–2025 light-duty vehicles. The proposed standards are projected to achieve 163 grams/mile of CO_2 in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon (mpg) if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021, and NHTSA intends to set standards for model years 2022–2025 in a future rulemaking.

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the USEPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles.

In August 2016, the USEPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans and all types of sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles sold under the program.[62]

In August 2017, the USEPA asked for additional information and data relevant to assessing whether the GHG emissions standards for model years 2022-2025 remain appropriate. In early 2018, the USEPA Administrator announced that the midterm evaluation for the GHG emissions standards for cars and light-duty trucks for model years 2022-2025 was completed and stated his determination that the current standards should be revised in light of recent data.

On September 27, 2019, the USEPA and NHTSA published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One.[63] The SAFE rule (Part One) went into effect in November 2019, and revoked California's authority to set its own GHGs standards and set zero emission vehicle mandates in California. The SAFE rule freezes new Zero-Emission Vehicle

[62] USEPA and NHTSA. 2016. Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium and Heavy-Duty Engines and Vehicles – Phase 2. Available at: https://www.gpo.gov/fdsys/pkg/FR-2016-10-25/pdf/2016-21203.pdf. Accessed October 13, 2020.

[63] One National Program. (84 Fed. Reg. 51,310 (Sept. 27, 2019.) Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-one-national-program-federal-preemption-state. Accessed October 13, 2020.

(ZEV) sales at model year 2020 levels for year 2021 and beyond, and will likely result in a lower number of future ZEVs and a corresponding greater number of future gasoline internal combustion engine vehicles. In April 2020, the federal agencies issued the Final SAFE Rule that relaxes federal GHG emissions and Corporate Average Fuel Economy (CAFE) standards for model year 2021 through 2026 vehicles. In response to the USEPA's adoption of the Final SAFE rule, CARB has issued guidance regarding the adjustment of vehicle emissions factors to account for the rule's implications on GHG emissions. [64]

2.2.1.3 Energy Independence and Security Act

The Energy Independence and Security Act of 2007 (EISA) facilitates the reduction of national GHG emissions by requiring the following:

- Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) that requires fuel producers to use at least 36 billion gallons of biofuel in 2022;
- Prescribing or revising standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labelling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances;
- Requiring approximately 25 percent greater efficiency for light bulbs by phasing out incandescent light bulbs between 2012 and 2014; requiring approximately 200 percent greater efficiency for light bulbs, or similar energy savings, by 2020; and
- While superseded by the USEPA and NHTSA actions described above, (i) establishing miles per gallon targets for cars and light trucks and (ii) directing the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for trucks.

Additional provisions of EISA address energy savings in government and public institutions, promote research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

2.2.1.4 Clean Power Plan and New Source Performance Standards for Electric Generating Units

On October 23, 2015, the USEPA published a final rule establishing the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electricity Utility Generating Units (80 FR 64510-64660), also known as the Clean Power Plan. These guidelines prescribe how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. The guidelines establish CO_2 emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: (1) fossil-fuel fired electric utility steam-generating units, and (2) stationary combustion turbines. Concurrently, the USEPA published a final rule establishing Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (80 FR 64661-65120). The rule prescribes CO_2 emission standards for newly constructed, modified, and

[64] CARB. June 26, 2020. EMFAC Off-Model Adjustment Factors for Carbon Dioxide (CO_2) Emissions to Account for the SAFE Vehicles Rule Part One and the Final SAFE Rule. Available at: https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf. Accessed November 17, 2020.

reconstructed affected fossil-fuel-fired electric utility generating units. On June 19, 2019, the USEPA issued the final Affordable Clean Energy rule (ACE), which replaced the Clean Power Plan. The ACE rule establishes emission guidelines for states to use when developing plans to limit carbon dioxide (CO_2) at their coal-fired electric generating units (EGUs). In this notice, the USEPA also repealed the Clean Power Plan, and issued new implementing regulations for ACE and future rules under section 111(d).

2.2.2 California Provisions

2.2.2.1 Executive Order S-3-05

In 2005, former Governor Schwarzenegger signed Executive Order (EO) S-3-05, which established the following statewide GHG emission reduction goals for California: (1) by 2010, reduce GHG emissions to 2000 levels; (2) by 2020, reduce GHG emissions to 1990 levels; and (3) by 2050, reduce GHG emissions to 80 percent below 1990 levels.

2.2.2.2 Assembly Bill 32

Assembly Bill (AB) 32 (Nunez, 2006), the California Global Warming Solutions Act of 2006, was enacted after considerable study and expert testimony before the Legislature. The heart of AB 32 is the requirement that statewide GHG emissions be reduced to 1990 levels by 2020. In order to achieve this reduction mandate, AB 32 requires CARB to adopt rules and regulations in an open public process that achieve the maximum technologically feasible and cost-effective GHG reductions.

Of relevance to this analysis, in 2007, CARB approved a statewide limit on the GHG emissions level for year 2020 consistent with the determined 1990 baseline. CARB's adoption of this limit is in accordance with Health & Safety Code Section 38550.

Per Health & Safety Code Section 38561(b), CARB also is required to prepare, approve and amend a scoping plan that identifies and makes recommendations on "direct emission reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives for sources and categories of sources that [CARB] finds are necessary or desirable to facilitate the achievement of the maximum feasible and cost-effective reductions of GHG emissions by 2020."

2.2.2.3 2008 Scoping Plan

In 2008, CARB adopted the *Climate Change Scoping Plan: A Framework for Change* (2008 Scoping Plan) in accordance with Health & Safety Code Section 38561. During the development of the 2008 Scoping Plan, CARB created a planning framework that is comprised of eight emissions sectors: (1) transportation; (2) electricity; (3) commercial and residential; (4) industry; (5) recycling and waste; (6) high global warming potential (GWP) gases; (7) agriculture; and, (8) forest net emissions.

The 2008 Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions from the eight emissions sectors to 1990 levels by 2020. In the Scoping Plan, CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of approximately 28.5 percent from the otherwise projected 2020 emissions level; i.e., those emissions that would occur in 2020, absent GHG-reducing laws and regulations (referred to as "Business-As-Usual" [BAU]).[65] For example, in further explaining CARB's BAU methodology, CARB assumed that all new

[65] CARB. Climate Change Scoping Plan: A Framework for Change (December 2008), p. 12.

electricity generation would be supplied by natural gas plants, no further regulatory action would impact vehicle fuel efficiency, and building energy efficiency codes would be held at 2005 standards.

To achieve the necessary GHG reductions to meet AB 32's 2020 target, CARB developed a series of reduction measures in the Scoping Plan covering a range of sectors and activities. Broadly, the reduction measures can be separated into capped sectors (i.e., covered by the Cap-and-Trade Program discussed below) and uncapped sectors. Emissions from capped sectors, which include the transportation, electricity, industrial, commercial, and residential sectors of the economy, were fixed under the rules of the Cap-and-Trade program, and the majority of policy proposals developed by CARB and other State agencies pursuing GHG emissions-reducing strategies are designed to secure reductions from these sectors.

Multiple Scoping Plan measures broadly cover emissions associated with new residential and commercial land use development, including, but not limited to:

- Energy Efficiency/Green Buildings. The Scoping Plan highlights the importance of energy efficiency efforts in reducing GHG emissions from residential and commercial development and indicates that zero net energy (ZNE) should be the overarching and unifying concept for energy efficiency.
- Regional Transportation-Related GHG Targets (SB 375). The Scoping Plan relies on SB 375, discussed in Section 2.2.2.11, as an important mechanism to reduce mobile GHG emissions by integrating land use planning and transportation planning at the regional and local level.
- Vehicle Emissions. The Scoping Plan relies on various engine, fuel and other efficiency improvement programs and increasing electrification of the vehicle fleet.
- Cap-and-Trade Program. The Scoping Plan identifies the Cap-and-Trade program as a lynchpin, overarching strategy for California to reduce GHG emissions. As explained in the Scoping Plan, the program's implementing regulations provide assurance that California's 2020 limit will be met because the regulation sets a firm limit on 85 percent of California's GHG emissions.

In the 2011 *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* (2011 Final Supplement), CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new economic data, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7 percent (down from 28.5 percent) from the BAU conditions. When the 2020 emissions level projection also was updated to account for newly implemented regulatory measures, including Pavley I (model years 2009–2016) and the Renewable Portfolio Standard (RPS) (12 percent to 20 percent), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16 percent (down from 28.5 percent) from the BAU conditions.

2.2.2.4 2014 First Update to the Scoping Plan

In 2014, CARB adopted the *First Update to the Climate Change Scoping Plan: Building on the Framework* (2014 First Update).[66] The stated purpose of the 2014 First Update is to

[66] Health & Safety Code Section 38561(h) requires CARB to update the Scoping Plan every five years.

"highlight[…] California's success to date in reducing its GHG emissions and lay[…] the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050."[67] The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32, and noted that California could reduce emissions further by 2030 to levels squarely in line with those needed to stay on track to reduce emissions to 80 percent below 1990 levels by 2050 if the State realizes the expected benefits of existing policy goals.[68]

In conjunction with the 2014 First Update, CARB identified "six key focus areas comprising major components of the State's economy to evaluate and describe the larger transformative actions that will be needed to meet the State's more expansive emission reduction needs by 2050."[69] Those six areas are: (1) energy; (2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure); (3) agriculture; (4) water; (5) waste management; and (6) natural and working lands. The 2014 First Update identifies key recommended actions for each sector that will facilitate achievement of the 2050 reduction target.

Based on CARB's research efforts, it has a "strong sense of the mix of technologies needed to reduce emissions through 2050."[70] Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies.

As part of the 2014 First Update, CARB recalculated the State's 1990 emissions level using more recent global warming potentials identified by the IPCC. Using the recalculated 1990 emissions level and the revised 2020 emissions level projection identified in the 2011 Final Supplement, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15.3 percent (instead of 28.5 percent or 16 percent) from the BAU conditions.

The 2014 First Update included a strong recommendation from CARB for setting a mid-term statewide GHG emissions reduction target. CARB specifically recommended that the mid-term target be consistent with: (i) the US' pledge to reduce emissions 42 percent below 2005 levels (which translates to a 35 percent reduction from 1990 levels in California); and (ii) the long-term policy goal of reducing emissions to 80 percent below 1990 levels by 2050.

The 2014 First Update discussed new residential and commercial building energy efficiency improvements, specifically identifying progress towards ZNE buildings as an element of meeting mid-term and long-term GHG reduction goals. The 2014 First Update expressed CARB's commitment to working with the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) to facilitate further achievements in building energy efficiency.

[67] CARB. First Update to the Climate Change Scoping Plan: Building on the Framework (May 2014), p. 4.

[68] Id. at p. 34.

[69] Id. at p. 6.

[70] Id. at p. 32.

2.2.2.5 2017 Second Update to the Scoping Plan

In November, 2017, CARB published California's 2017 Climate Change Scoping Plan (Second Update).[71] This update identifies CARB's strategy for achieving the state's 2030 GHG target as established in SB 32 (discussed below).The strategy includes continuation of the Cap-and-Trade Program through 2030, and incorporates a Mobile Source Strategy that includes strategies targeted to increase zero emission vehicle fleet penetration and a more stringent target for the Low Carbon Fuel Standard by 2030. The Second Update also incorporates approaches to cutting short-lived climate pollutants (SLCPs) under the Short-Lived Climate Pollutant Reduction Strategy (a planning document that was adopted by CARB in March 2017), and acknowledges the need for reducing emissions in agriculture and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon. During development of the Second Update, CARB held a number of public workshops in the Natural and Working Lands, Agriculture, Energy and Transportation sectors to inform development of the 2030 Scoping Plan Update.[72]

When discussing project-level GHG emissions reduction actions and thresholds, the Second Update states "[a]chieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA." On December 14, 2017, CARB adopted the 2017 Climate Change Scoping Plan.

2.2.2.6 Executive Order B-30-15

In April 2015, Governor Brown signed EO B-30-15, which established the following GHG emission reduction goal for California: by 2030, reduce GHG emissions to 40 percent below 1990 levels. This EO also directed all state agencies with jurisdiction over GHG-emitting sources to implement measures designed to achieve the new interim 2030 goal, as well as the pre-existing, long-term 2050 goal identified in EO S-3-05 (see discussion above). Additionally, the EO directed CARB to update its Scoping Plan (see discussion above) to address the 2030 goal.

2.2.2.7 Senate Bill 32 and Assembly Bill 197

Enacted in 2016, SB 32 (Pavley, 2016) codifies the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030.

SB 32 was coupled with a companion bill: AB 197 (Garcia, 2016). Designed to improve the transparency of CARB's regulatory and policy-oriented processes, AB 197 created the Joint Legislative Committee on Climate Change Policies, a committee with the responsibility to ascertain facts and make recommendations to the Legislature concerning statewide programs, policies, and investments related to climate change. AB 197 also requires CARB to make certain GHG emissions inventory data publicly available on its web site; consider the social costs of GHG emissions when adopting rules and regulations designed to achieve GHG

[71] CARB. 2017. California's 2017 Climate Change Scoping Plan. November. Available at: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed October 13, 2020.

[72] CARB. 2016. Timeline of AB 32 Scoping Plan Activities. Available at: https://www.arb.ca.gov/cc/scopingplan/timeline.htm. Accessed October 13, 2020.

emission reductions; and, include specified information in all Scoping Plan updates for the emission reduction measures contained therein.

2.2.2.8 Executive Order B-55-18

In 2018, former Governor Jerry Brown signed EO B-55-18. This established a new state-wide goal to achieve carbon neutrality as soon as possible and no later than 2045 and to achieve and maintain net negative emissions thereafter.

2.2.2.9 Executive Order EO N-79-20

In September 2020, Governor Jerry Brown signed an executive order banning the sale of new gas cars and trucks after 2035. It will still allow such vehicles to be owned and sold on the used-car market.

2.2.2.10 Energy Sources

Renewable Portfolio Standard

As most recently amended by SB 100 (2018), California's Renewables Portfolio Standard requires retail sellers of electric services and local publicly-owned electric utilities to increase procurement from eligible renewable energy resources to 50 percent of total retail sales by 2026, and 60 percent of total retail sales by 2030. SB 100 also established a state policy goal to achieve 100 percent carbon-free electricity by 2045.

Building Energy Efficiency Standards

The Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations, were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, lighting, and whole envelope. The 2005, 2008, 2013, 2016 and 2019 updates to the efficiency standards included provisions such as cool roofs on commercial buildings, increased use of skylights, and higher efficiency lighting, heating, ventilation and air conditioning (HVAC), and water heating systems. Additionally, some standards focused on larger energy saving concepts such as reducing loads at peak periods and seasons and improving the quality of such energy-saving installations. Past updates to the Title 24 standards have proven very effective in reducing building energy use. The 2019 Title 24 standards are the currently applicable building energy efficiency standards, and became effective on January 1, 2020.[73] The 2019 updates include a requirement for solar photovoltaic systems for new homes, requirements for newly constructed healthcare facilities, additional high efficiency lighting requirements, high performance attic and walls, higher efficiency water and space heaters, and high efficiency air filters. Relative to the 2016 standards, the 2019 standards are expected to reduce high-rise residential and non-residential electricity consumption by approximately 10.7% and natural gas consumption by

[73] CEC. 2019. California's Energy Efficiency Standards for Residential and Nonresidential Buildings. Available online at: https://www.energy.ca.gov/title24/2019standards/. Accessed October 13, 2020.

1% and require new low-rise residential buildings to achieve zero net electricity consumption using a combination of building efficiency and on-site renewable electricity generation.[74]

In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CalGreen Building Standard (CalGreen), and establishes voluntary and mandatory standards pertaining to the planning and design of sustainable site development, energy efficiency, water conservation, material conservation, and interior air quality. Like Part 6 of Title 24, the CalGreen standards are periodically updated, with increasing energy savings and efficiencies associated with each code update.

Appliance Standards

The CEC periodically amends and enforces Appliance Efficiency Regulations contained in Title 20 of the California Code of Regulations. The regulations establish water and energy efficiency standards for both federally regulated appliances and non-federally regulated appliances. The most current Appliance Efficiency Regulations, dated January 2020, cover 24 categories of appliances (e.g., refrigerators; plumbing fixtures; dishwashers; clothes washer and dryers; televisions) and apply to appliances offered for sale in California.[75]

2.2.2.11 Mobile Sources

Sustainable Communities Strategy Plans

SB 375 (Steinberg, 2008), the Sustainable Communities and Climate Protection Act, coordinates land use planning, regional transportation plans, and funding priorities to reduce GHG emissions from passenger vehicles through better-integrated regional transportation, land use, and housing planning that provides easier access to jobs, services, public transit, and active transportation options. SB 375 specifically requires the Metropolitan Planning Organization (MPO) relevant to the Project area (here, Metropolitan Transportation Commission and Association of Bay Area Governments [MTC/ABAG]) to include a Sustainable Communities Strategy in its Regional Transportation Plan (RTP) that will achieve GHG emission reduction targets set by CARB by reducing vehicle miles travelled (VMT) from light-duty vehicles through the development of more compact, complete, and efficient communities.

In 2011, CARB adopted Regional Targets of 7% for 2020 and 15% for 2035 for the area under the jurisdiction of MTC/ABAG. These targets were in place through September 30, 2018. In March 2018, CARB approved updated regional targets of 10% for 2020 and 19% for 2035 for MTC/ABAG, which will be applied by MTC/ABAG in future planning cycles.

Senate Bill 743

Public Resources Code Section 21099(c)(1), as codified through enactment of SB 743, was enacted with the intent to change the focus of transportation analyses conducted under CEQA. SB 743 reflects a legislative policy to balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of GHG emissions. SB 743 requires the OPR to establish

[74] NORESCO. 2018. Impact Analysis: 2019 Update to the California Energy Efficiency Standards for Residential and Non-Residential Buildings. Prepared for CEC. Contract 400-15-006.

[75] CEC. 2020. 2019 Appliance Efficiency Regulations. Available at: https://www.energy.ca.gov/programs-and-topics/programs/appliance-efficiency-program-outreach-and-education. Accessed October 13, 2020.

"alternative metrics to the metrics used for traffic levels of service for transportation impacts outside transit priority areas."[76] Under SB 743, the new metrics or significance criteria must promote the reduction of GHG emissions, the development of multimodal transportation networks, and a diversity of land uses. SB 743 dictates that once the CEQA Guidelines are amended to include new thresholds, automobile delay, as described by level of service or similar measures of vehicular capacity or congestion, shall no longer be considered a significant impact under CEQA in all locations in which the new thresholds are applied. The Legislature gave OPR the option of applying the new thresholds only to transit priority areas, or more broadly to areas throughout the State. OPR proposed to apply the new thresholds throughout the State.

In January 2016, OPR issued its *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* (Revised SB 743 Proposal). Included in the Revised SB 743 Proposal were proposed new CEQA Guidelines Section 15064.3 and related revisions to Appendix G. Under the proposed new Guidelines, the analysis of transportation impacts in the CEQA context would shift from a levels of service metric to a VMT metric. In proposing the new approach, OPR noted the relationship between VMT and GHG emissions.

A VMT metric was adopted as part of the 2018 CEQA Guidelines Amendments (described above), which became effective on December 28, 2018. As described in the Final Statement of Reasoning[77] for the 2018 CEQA Guidelines amendments: "The current emphasis on traffic congestion in transportation analyses tends to promote increased vehicle use. This new guidance instead focuses on a project's effect on VMT, which should promote project designs that reduce reliance on automobile travel."

Pavley Regulations

AB 1493 (Pavley, 2002) required CARB to adopt regulations to reduce GHG emissions from non-commercial passenger vehicles and light-duty trucks for model years 2009–2016. CARB obtained a waiver from the USEPA that allows for implementation of these regulations notwithstanding possible federal pre-emption concerns.

Low Carbon Fuel Standard

EO S-1-07, as issued by former Governor Schwarzenegger, called for a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California regulated by CARB by 2020.[78] In response, CARB approved the Low Carbon Fuel Standard (LCFS) regulations in 2009, which became fully effective in April 2010. Thereafter, a lawsuit was filed challenging CARB's adoption of the regulations; and, in 2013, a court order was issued compelling CARB to remedy substantive and procedural defects of the LCFS adoption process under CEQA.[79] However, the court allowed implementation of the LCFS to continue pending

[76] California Legislative Information. 2013. SB-743 Environmental quality: transit oriented infill projects, judicial review streamlining for environmental leadership development projects, and entertainment and sports center in the City of Sacramento. Available at: http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB743. Accessed October 13, 2020.

[77] CNRA. 2018. Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines. Available at: http://resources.ca.gov/ceqa/docs/2018_CEQA_Final_Statement_of%20Reasons_111218.pdf. Accessed October 13, 2020.

[78] Carbon intensity is a measure of the GHG emissions associated with the various production, distribution, and use steps in the "lifecycle" of a transportation fuel.

[79] *POET, LLC v. CARB* (2013) 217 Cal.App.4th 1214.

correction of the identified defects. In September 2015, CARB re-adopted the LCFS regulations.

Advanced Clean Cars Program

In 2012, CARB approved the Advanced Clean Cars (ACC) program, a new emissions-control program for non-commercial passenger vehicles and light-duty truck for model years 2017–2025. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero emission vehicles. By 2025, when the rules will be fully implemented, new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions. The ACC program was permitted because the Federal Clean Air Act Section 209 allows California to set vehicle emissions standards more stringent than those set nationwide by the USEPA. In 2019, the Trump Administration moved to revoke this permission, and as of the time of this writing this is under litigation.

Zero Emission Vehicles

ZEVs include hydrogen fuel cell electric vehicles and plug-in electric vehicles, such as battery electric vehicles and plug-in hybrid electric vehicles.

In 2012, Governor Brown issued EO B-16-2012, which calls for the increased penetration of ZEVs into California's vehicle fleet in order to help California achieve a reduction of GHG emissions from the transportation sector equalling 80 percent less than 1990 levels by 2050. In furtherance of that statewide target for the transportation sector, the EO also calls upon CARB, the CEC and the California Public Utilities Commission to establish benchmarks that will: (1) allow over 1.5 million ZEVs to be on California roadways by 2025, and (2) provide the State's residents with easy access to ZEV infrastructure.

EO B-16-2012 specifically directed California to "encourage the development and success of zero-emission vehicles to protect the environment, stimulate economic growth, and improve the quality of life in the state."[80]

In furtherance of the EO B-16-2012 targets, in February 2013, the Governor's Interagency Working Group on Zero-emission Vehicles issued the *2013 ZEV Action Plan: A roadmap toward 1.5 million zero-emission vehicles on California* roadways *by 2025*.[81] The 2013 ZEV Action Plan identifies four broad goals for state government to advance ZEVs: 1) Complete needed infrastructure and planning; 2) Expand consumer awareness and demand; 3) Transform Fleets; and 4) Grow jobs and investment in the private sector. As part of these goals, some highlighted strategies and actions include: i) supporting ZEV infrastructure planning and investment by private entities; ii) enabling universal access to ZEV infrastructure for California drivers; iii) reducing upfront purchase costs for ZEVs; iv) promoting consumer awareness of ZEVs; and v) helping to expand ZEVs in bus fleets. The Action Plan discusses the challenges of ZEV expansion, which include the need to enable electric vehicle chargers in homes, increase consumer awareness, address up-front costs and operational limitations, and address that ZEVs are not commercially available for all categories of vehicles.

[80] Executive Order B-16-2012. Available at: https://www.ca.gov/archive/gov39/2012/03/23/news17472/index.html. Accessed October 13, 2020.

[81] Governor's Interagency Working Group on Zero-emission Vehicles. 2013. Available at: http://opr.ca.gov/docs/Governors_Office_ZEV_Action_Plan_(02-13).pdf. Accessed October 13, 2020.

In October 2016, the Governor's Interagency Working Group on Zero-emission Vehicles issued the *2016 ZEV Action Plan: A roadmap toward 1.5 million zero-emission vehicles on California* roadways *by 2025*.[82] This report provides an update on progress toward achieving the 2013 goals and highlights priority focus areas such as raising awareness, given that most consumers are still not aware of the benefits of passenger ZEVs and that over 1,000,000 charge points will be needed at homes, workplaces, and public locations but only 11,000 non-home charge points are installed as stated in the 2016 ZEV Action Plan.

In January 2018, Governor Brown signed EO B-48-18 issuing a "Priorities Update": *An update to the 2016 Zero-Emission Vehicle Action Plan to help expand private investment to the zero-emission vehicle infrastructure, particularly in the low income and disadvantaged communities.* The initiative is focused on deploying charging and fuelling infrastructure through multi-stakeholder efforts, thus increasing both ownership and operations of ZEVs. The 2018 Priorities Update focuses specifically on state agency actions and is designed to serve three fundamental purposes: 1) Provide direction to state agencies on the most important actions to be executed in 2018 to enable the progress toward the 2025 targets and 2030 vision. 2) Give Stakeholders transparency into the actions state agencies plan to take (or are taking) this year to further the ZEV market. 3) Create a platform for stakeholder engagement, feedback, and collaboration.[83]

In September 2020, Governor Newsom signed EO N-79-20, which sets a new State goal that 100 percent of in-state sales of new passenger cars and trucks will be zero-emission by 2035; that 100 percent of medium- and heavy-duty vehicles in the State be zero-emission by 2045 for all operations where feasible; and by 2035 for drayage trucks; and that 100 percent of off-road vehicles and equipment will be zero emission by 2035 where feasible. This order calls upon state agencies including ARB, the CEC, the CPUC, the Department of Finance, and others to develop and propose regulations and strategies to achieve these goals.

Other statewide and regional initiatives that spur ZEV uptake include the following:

- ARB currently subsidizes the purchase of passenger near-zero and zero emission vehicles, as well as through the provision of access to high-occupancy vehicle (HOV) lanes to ZEV drivers.
- The Volkswagen settlement would result in $800 million in ZEV projects in California over the next ten years.[84]
- The California Green Building Standards Code (Part 11 of Title 24, California Code of Regulations) (CALGreen) requires new residential and non-residential construction to be pre-wired to facilitate the future installation and use of electric vehicle chargers (see Section 4.106.4 and Section 5.106.5.3 of 2019 CALGreen Standards for the residential and non-residential pre-wiring requirements, respectively).

[82] Governor's Interagency Working Group on Zero-emission Vehicles. 2016. Available at: https://www.ca.gov/archive/gov39/wp-content/uploads/2018/01/2016_ZEV_Action_Plan-1.pdf. Accessed: October 13, 2020.

[83] Governor's Interagency Working Group on Zero-emission Vehicles. 2018. 2018 ZEV Action Plan Priorities Update. Available at: https://static.business.ca.gov/wp-content/uploads/2019/12/2018-ZEV-Action-Plan-Priorities-Update.pdf. Accessed: October 13, 2020.

[84] ARB, Volkswagen Settlement – California ZEV Investments webpage, available at: https://www.arb.ca.gov/msprog/vw_info/vsi/vw-zevinvest/vw-zevinvest.htm. Accessed October 13, 2020.

- In January 2017, three of California's largest utilities submitted proposals to the CPUC to electrify the state's transportation sector through more than $1 billion in investments.
- Pacific Gas and Electric (PG&E) submitted an application that aims to expand the electrification of medium- and heavy-duty vehicle fleets, expand fast-charging stations that can refuel EVs in 20-30 minutes, and explore new uses for vehicle electrification.[85]
- MTC's Climate Initiatives Program aims to reduce the transportation sector's carbon footprint. Since 2009, MTC has invested $102 million towards reducing transportation related GHG emissions. Some activities that this program has funded include car sharing, climate initiative innovation grants, the commuter benefits program, EV activities, and EV infrastructure and incentives.[86] MTC's Plan Bay Area 2040 directs $526 million to the program and $56 million for incentivizing carpooling.

2.2.2.12 Solid Waste Diversion

The California Integrated Waste Management Act of 1989, as modified by AB 341 (Chesbro, 2011), requires each jurisdiction's source reduction and recycling element to include an implementation schedule that shows: (1) diversion of 25 percent of all solid waste by January 1, 1995, through source reduction, recycling, and composting activities; (2) diversion of 50 percent of all solid waste on and after January 1, 2000; and (3) source reduction, recycling and composting of 75 percent of all solid waste on or after 2020, and annually thereafter. The California Department of Resources Recycling and Recovery (CalRecycle) is required to develop strategies, including source reduction, recycling, and composting activities, to achieve the 2020 goal.

CalRecycle published a discussion document, entitled *California's New Goal: 75 Percent Recycling,* which identified concepts that would assist the State in reaching the 75 percent goal by 2020. Subsequently, in August 2015, CalRecycle released the *AB 341 Report to the Legislature*, which identifies five priority strategies for achievement of the 75 percent goal: (1) moving organics out of landfills; (2) expanding recycling/ manufacturing infrastructure; (3) exploring new approaches for State and local funding of sustainable waste management programs; (4) promoting State procurement of post-consumer recycled content products; and, (5) promoting extended producer responsibility.

2.2.2.13 California Environmental Quality Act Guidelines on Greenhouse Gas Emissions

In 2007, SB 97 was enacted and directed OPR and the California Natural Resources Agency (CNRA) to prepare amendments to the CEQA Guidelines addressing the analysis of GHG emissions under CEQA. Following formal rulemaking, a series of amendments to the CEQA Guidelines were adopted to provide the general framework for the analysis of GHG emissions, and became effective in 2010. The amendments do not provide a mandatory, quantitative rubric for GHG emissions analysis, but instead provide general guidance and recognize long-standing CEQA principles regarding the discretion afforded to lead agencies where supported by substantial evidence. More specifically, CEQA Guidelines Section

[85] PG&E, In the Matter of the Application of Pacific Gas and Electric Company for Approval of its Senate Bill 350 Transportation Electrification Program (January 20, 2017).

[86] Climate Initiatives Program. Available at: https://mtc.ca.gov/our-work/plans-projects/climate-change-programs/climate-initiatives-program. Accessed October 13, 2020.

15064.4(a) recognizes that the "determination of the significance" of GHG emissions "calls for careful judgment by the lead agency" in accordance with the more general provisions of CEQA Guidelines Section 15064; each agency "shall have discretion to determine" whether to conduct quantitative or qualitative analysis, provided its determination is supported by substantial evidence.

2.2.3 Regional Provisions

2.2.3.1 BAAQMD Clean Air Plan

BAAQMD and other air districts prepare clean air plans in accordance with the state and federal Clean Air Acts. On April 19, 2017, the BAAQMD Board of Directors adopted the 2017 Clean Air Plan" Spare the Air, Cool the Climate, an update to the 2010 Clean Air Plan.[87] The Clean Air Plan is a comprehensive plan that focuses on the closely-related goals of protecting public health and protecting the climate. Consistent with the State's GHG reduction targets, the plan lays the groundwork for a long-term effort to reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.

As part of the Basin-Wide Methane Strategy outlined in the 2017 Clean Air Plan, BAAQMD is currently developing a new regulation to address significant releases of CH_4 in the Bay Area, called Regulation 13, Rule 1: Significant Methane Releases, which would serve as a general backstop rule to address releases of CH_4 from regulated sources.

2.2.3.2 BAAQMD CEQA GUIDELINES

BAAQMD developed quantitative thresholds of significance to assist in review of projects under CEQA (BAAQMD CEQA Guidelines) in 2010. BAAQMD published a new version of its CEQA Guidelines in May 2017. The BAAQMD CEQA Guidelines provide BAAQMD-recommended procedures for evaluating potential GHG emissions during the environmental review process consistent with CEQA requirements.

BAAQMD thresholds are based on the AB 32 GHG reduction goals and a "gap analysis" that attributes an appropriate share of GHG emissions reductions to new land use development projects in BAAQMD's jurisdiction. The efficiency threshold (4.6 MT of CO_2e per service population) was calculated by dividing the AB 32 GHG reduction target for land use development emissions in California by the estimated 2020 population and employment level.[88] BAAQMD thresholds are tied directly to AB 32 and statewide emissions reduction goals for 2020.

2.2.3.3 BAAQMD Regional Climate Protection Strategy Resolution

On November 6, 2013, the BAAQMD Board passed a resolution adopting a regional target of achieving 80% below 1990 levels of GHG emissions by 2050. This reduction goal matches that of Executive Order S-3-05, described earlier. In addition, the resolution commits BAAQMD to develop a regional climate protection strategy, including a Bay Area climate

[87] Spare the Air, Cool the Climate – Final 2017 Clean Air Plan. BAAQMD. Published April 19, 2017. https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed October 13, 2020.

[88] BAAQMD. 2010. Proposed Thresholds of Significance. May.

protection work program that was included as an element of BAAQMD's 2017 Clean Air Plan (described above).[89]

2.2.3.4 ABAG/MTC Sustainable Communities Strategy (SB 375)

As discussed above, SB 375 is intended to help achieve AB 32's goals by coordinating land use and transportation planning, along with funding priorities. SB 375 requires each MPO in California to develop a Sustainable Communities Strategy (SCS) as part of its RTP that will achieve the GHG reduction targets required by AB 32. As described above, the MTC and the ABAG developed an SCS for the San Francisco Bay Area and incorporated it and a new RTP into a "Plan Bay Area."

2.2.4 Local Provisions[90]

2.2.4.1 City of Berkeley General Plan

The General Plan for the City of Berkeley contains several environmental management policies aimed at improving sustainability within the city. They are outlined below[91]:

- EM-4 Green Building Certification: Develop a green building code which all new structures are encouraged to adhere to.
- EM-7 Reduced Wastes: Encourage reduction of waste sent to landfills, reuse and recycling.
- EM-8 Building Reuse and Construction Waste: Encourage reuse and rehabilitation of buildings and demolition materials to reduce energy use and waste sent to landfills.
- EM-18 Regional Air Quality Action: Enforce emissions limits and reduce emissions through pollution prevention methods, reductions in local traffic, and appropriate parking locations to prevent circling.
- EM-21 Alternative Fuels: Work with community partners to establish electric and natural gas vehicle fuelling stations throughout the city.
- EM-36 Energy Conservation: Encourage development patterns and building design which are energy efficient and reduce pollution.
- EM-39 Business Energy Conservation: Encourage businesses to implement energy conservation plans.
- EM-41 Fossil Fuel: Encourage use of non-fossil fuels and locating housing near transport and job centres to reduce fossil fuel use.

2.2.4.2 Green Building Requirements

The City of Berkeley requires that all new buildings meet California State Green Building Code (CALGreen) requirements. In addition the city has outlined supplemental policies to

[89] BAAQMD. Air District Board passes climate protection resolution. November 6. http://www.baaqmd.gov/~/media/Files/Communications%20and%20Outreach/Publications/News%20Releases/2013/climateres_131106.ashx?la=en. Accessed October 13, 2020.

[90] The Bayer project site is subject to a 1992 Development Agreement that vests Bayer into many laws as they existed in 1992. Inclusion of local frameworks below is not intended to provide a legal opinion as to whether a given modern ordinance or other regulation is applicable except as expressly noted.

[91] City of Berkeley General Plan: A Guide to Public Decision Making. 2003. https://www.cityofberkeley.info/Planning_and_Development/Home/General_Plan__A_Guide_for_Public_Decision-Making.aspx. Accessed October 13, 2020.

ensure additional waste diversion, reductions in energy and water usage and meeting the community Climate Action Goals.[92] All buildings greater than 10,000 sqft are required to use the GreenPoint Rated Checklist and new buildings in the downtown area are required to be LEED Gold certified. To reduce energy use, energy conservation analysis is required for commercial projects greater than 10,000 sqft and owners are required to complete whole-building energy efficiency assessments and publicly report this information prior to sale. To protect water, requirements are in place to manage stormwater runoff, protect creek health, fix leaks in sewer laterals and comply with the Bay Friendly Landscaping Checklist. In order to reduce waste, projects must divert demolition debris away from landfills via reuse, recycling and compost and all businesses and multi-family units must provide on-site recycling services.

2.2.4.3 Berkeley Natural Gas Prohibition

The Berkeley City council passed an ordinance prohibiting natural gas infrastructure (e.g., gas hook-ups) in any new building.[93] This ordinance prohibits natural gas infrastructure that is typically used to provide water and space heating, cooking, and other uses, in any building of all types including residential and non-residential buildings. The City suggests that Building Electrification is the substitution to gas appliances (furnaces, water heaters, cooking ranges and stoves, dryers, etc.) with lean, safe, and highly efficient all-electric alternatives. The Natural Gas Prohibition Ordinance does not impose an absolute prohibition, and does not apply where "it is not physically feasible to construct the building without Natural Gas Infrastructure." Separately, there is an exception where natural gas usage is in the public interest, and is necessary to the health, safety, and welfare of the public. The Project envisions natural gas usage only for manufacturing lab facilities, and not for production, administration, maintenance, and warehouse facilities. The prohibition of natural gas usage in the project is not technologically feasible in manufacturing and laboratory operations, and requiring its ban in manufacturing lab facilities would materially and adversely affect the biopharmaceutical manufacturing process and the production of medicines. More specifically, an electrically powered alternative is not available that would allow project operations to meet the BSL-2 and other strict protocols and contamination performance standards necessary for cell therapy and other biopharmaceutical processes envisioned under the project. Manufacturing lab facilities therefore would be exempt under the Natural Gas Prohibition Ordinance (as well as the terms of the Development Agreement, which vests the site into older City ordinances).

2.2.4.4 Berkeley Electric Mobility Roadmap

In April 2020, the City of Berkeley put out the Electric Mobility Roadmap with a vision for creating a fossil-fuel-free public transport system and supports city efforts to increase walking, biking and transit use. The Roadmap outlines several goals, including ensuring equity in access to public transit, improving alternatives to driving and achieving net zero carbon emissions from private vehicles. To achieve this, Berkeley will prioritize walking and

[92] Energy and Sustainable Development Green Building Requirements. City of Berkeley. Available online at: https://www.cityofberkeley.info/Green_Building_Requirements/. Accessed October 13, 2020.

[93] City of Berkeley. 2019. Ordinance No. 7,672-N.S. Available at: https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/2019-07-23%20Item%20C%20Prohibiting%20Natural%20Gas%20Infrastructure.pdf. Accessed October 13, 2020.

transit over electric vehicles, and electric vehicles over private gas vehicles in planning and policy decisions.[94]

2.2.4.5 Berkeley Climate Action Plan

In 2006 Berkeley voters approved ballot Measure G which put forth a mandate to reduce the community's GHG emissions by 80% below 2000 levels by 2050. In 2009, the City of Berkeley adopted the Climate Action Plan written through a community-wide process as a result of this measure. The community's target is to reduce emissions by 33% below 2000 levels for 2020. The plan outlines the following vision for the city:[95]

- New and existing Berkeley buildings achieve ZNE consumption through increased energy efficiency and a shift to renewable energy sources such as solar and wind
- Public transit, walking, cycling, and other sustainable mobility modes are the primary means of transportation for Berkeley residents and visitors
- Personal vehicles run on electricity produced from renewable sources or other low-carbon fuels
- Zero waste is sent to landfills
- The majority of food consumed in Berkeley is produced locally
- Our community is resilient and prepared for the impacts of global warming
- The social and economic benefits of the climate protection effort are shared across the community

Following the committal by Governor Jerry Brown in 2018 to the more aggressive goal of a carbon-neutral California by 2045, the Berkeley City Council resolved to become a "Fossil Fuel-Free City". In July 2020, staff prepared a report summarizing work done throughout the City to meet Berkeley's climate goals; however, to date an updated Climate Action Plan has not been adopted.[96]

2.2.4.6 Mayor's Commitment to Net Zero Carbon Emissions

In September 2018, City of Berkeley Mayor Arreguin set a goal to reach 100% renewable electricity by 2035 and to achieve net zero carbon emissions by 2050. These commitments have been discussed within the Climate Action Plan Update working sessions.[97]

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[94] Berkeley Electric Vehicle Roadmap. Published April 2020. https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/City%20of%20Berkeley%20Electric%20Mobility%20Roadmap_2020.pdf. Accessed October 13, 2020.

[95] City of Berkeley Climate Action Plan. Published June 2009. https://www.cityofberkeley.info/climate/. Accessed October 13, 2020.

[96] City of Berkeley. 2020. Climate Action Plan and Resilience Update. Available at: https://www.cityofberkeley.info/Clerk/City_Council/2020/07_Jul/Documents/2020-07-21_Special_Item_05_Climate_Action_Plan_pdf.aspx. Accessed October 13, 2020.

[97] City of Berkeley. 2018. Climate Action Plan Update Work session. Available at: https://www.cityofberkeley.info/Clerk/City_Council/2018/12_Dec/Documents/2018-12-06_WS_Item_01_Climate_Action_Plan_Update_pdf.aspx#:~:text=Mayor's%20Commitment%20to%20Net%2DZero,emissions%20by%20the%20year%202050. Accessed: November 17, 2020.

3. IMPACTS AND MITIGATION MEASURES

3.1 Standards of Significance

3.1.1 CEQA Guidelines Appendix G Thresholds

As described in Section 2.2, the 2009 amendments to the state CEQA Guidelines do not establish specific thresholds of significance for GHG impacts. Rather, Section 15064.4 of the CEQA Guidelines emphasizes the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA.[98] Appendix G of the CEQA Guidelines, the Environmental Checklist Form, is often used as a basis for lead agencies' selection of significance thresholds, but it does not prescribe specific thresholds. Rather, Appendix G suggests evaluating whether a project would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant adverse impact on the environment; or
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Guidelines section 15064.4(b) states that in evaluating the significance of impacts from GHG emissions, the lead agency should consider the following factors, among others:

- The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting.
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions.

3.1.2 BAAQMD Significance Threshold

BAAQMD presents its thresholds of significance along with methods for evaluating compliance in its guidance document entitled CEQA Air Quality Guidelines (updated May 2017).[99,]

With respect to Project operations, BAAQMD's guidelines establish three potential analysis criteria for land use development projects:

- Compliance with a qualified Climate Action Plan, with a goal consistent with AB 32,
- A mass emissions threshold of 1,100 MT of CO2e per year ("*de minimis* threshold"), or

[98] CNRA. 2009. Revised Text of Proposed Guideline Amendments. Sacramento, CA. http://resources.ca.gov/ceqa/docs/FINAL_Text_of_Proposed_Amendemts.pdf. Accessed October 13, 2020.

[99] BAAQMD. 2017. California Environmental Quality Act Air Quality Guidelines. https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed October 13, 2020.

- A GHG efficiency threshold of 4.6 MT of CO2e per service population (project jobs + project residents).

BAAQMD thresholds are based on the AB 32 GHG reduction goals and a "gap analysis" that attributes an appropriate share of GHG emissions reductions to new land use development projects in BAAQMD's jurisdiction. The efficiency threshold (4.6 MT of CO_2e per service population) was calculated by dividing the AB 32 GHG reduction target for land use development emissions in California by the estimated 2020 population and employment level.[100] BAAQMD thresholds are tied directly to AB 32 and statewide emissions reduction goals for 2020.

In addition, BAAQMD has a stationary source threshold of 10,000 MT of CO_2e per year. This is based upon a determination that approximately 95% of all GHG emissions from new permit applications for stationary sources in the San Francisco Bay Area would be captured by this threshold.

3.1.3 Thresholds Used in Assessment

BAAQMD developed its thresholds to achieve the AB 32 goals through 2020. However, SB 32 addresses GHG emissions reductions through 2030. Long-term goals for 2030, 2045, and 2050 also have been articulated in EO B-30-15, EO B-55-18, and EO S-3-05, respectively.

Achieving SB 32 and the Executive Orders' 2045 and 2050 GHG emissions reduction goals will require systemic changes in how energy is produced and consumed through all sectors of the economy (as discussed in greater detail in the impact analysis below). Because the mix of technologies, strategies, and policy choices the state will ultimately choose to implement to achieve the post-2030 goals is not readily ascertainable at this time, any accounting of future GHG emissions from an individual development project cannot yet reflect the scope and scale of reductions that may occur as the state transitions toward new regulations designed to achieve the new long-term goals. Furthermore, in absence of a state plan to achieve these long-term goals, it is difficult to identify the "fair share" of reductions to be applied at the local or project level.

The Association of Environmental Professionals (AEP) Climate Change Committee recommended in a 2015 white paper that CEQA analyses for multiple-phase projects with post-2020 development not only "consider consistency with the 2020/AB 32-based framework but also analyze the consequences of post-2020 GHG emissions in terms of their impacts on the reduction trajectory from 2020 toward 2050."[101] AEP further recommends that the "significance determination…should be based on consistency with substantial progress along a post-2020 trajectory."[102] The AEP white paper is advisory only and is not binding guidance or an adopted set of CEQA thresholds. The Project would continue to generate operational GHG emissions in future years; thus, a post-2020 discussion is warranted.

Here, there is no applicable plan, policy, or regulation enacted or adopted for Berkeley for the post-2020 timeframe that meets the standards set forth in Guidelines section 15064.4(b). Therefore, the City has elected to use project-specific thresholds for the

[100] BAAQMD. 2010. Proposed Thresholds of Significance. May.

[101] Association of Environmental Professionals. 2015. Beyond 2020: The Challenge of GHG Reduction Planning by Local Governments. Draft. March 16.

[102] Association of Environmental Professionals. 2015. Beyond 2020: The Challenge of GHG Reduction Planning by Local Governments. Draft. March 16.

purposes of this EIR. Specifically, the Project would be deemed to have a significant adverse impact[103] related to GHG emissions if it would:

1. Exceed BAAQMD's *de minimis* threshold for construction and operations or exceed BAAQMD's stationary source threshold for stationary sources; or
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The *de minimis* threshold was originally proposed by BAAQMD for year 2020 at 1,100 MT CO_2e per year from the sum of amortized construction and annual operations of a project. It assumed that 59 percent of all projects would be above this mass emissions threshold and that each project above the threshold would mitigate its GHG emissions by 26 percent. However, since the BAAQMD thresholds were first promulgated, the State has implemented additional stringent regulations to control and reduce statewide GHG emissions, including updated Title 24 standards, additional RPS electricity requirements, expanded Cap-and-Trade coverage, and improved mobile vehicle regulations. Therefore, more projects would fall under the *de minimis* threshold now than under BAAQMD's original analysis. This threshold might decrease in future years to remain consistent with the State's longer-term climate goals, but additional analyses would be needed to substantiate any change to the threshold in future years. To be conservative, this Project uses a threshold of 0 MT CO_2e per year (e.g., no net increase in emissions). The use of a net zero *de minimis* threshold does not establish a precedent for use for any other project within the City. The stationary source threshold of 10,000 MT of CO_2e per year is based upon a determination that approximately 95% of all GHG emissions from new permit applications for stationary sources in the San Francisco Bay Area would be captured by this threshold.

The second threshold can be satisfied with a qualitative discussion of the Project's consistency with AB 32, the CARB Scoping Plan, the region's Sustainable Communities Strategy/RTP (Plan Bay Area), Executive Order S-3-05, Executive Order B-16-12, Executive Order B-55-18 and SB 32. This analysis discusses the goals and assesses whether the project emissions would be consistent with the trajectory needed to achieve the goals.

3.2 Approach to Analysis

This section describes the methodology that Ramboll US Consulting, Inc (Ramboll) used to develop the existing conditions and Project GHG emission inventories and address the significance thresholds identified above. Emissions sources include construction activities and emissions from Project operations due to electricity and natural gas use, vehicle travel, new stationary sources (e.g., new emergency standby diesel generators, natural gas boilers), solid waste, and water supply and wastewater. The analysis conducted for this GHG impact assessment uses emission factors, models, and tools distributed by a variety of agencies, including CARB, the California Air Pollution Officers Association, and the USEPA. Additionally, the analysis includes methodologies identified in the BAAQMD CEQA Air Quality Guidelines (May 2017). Full details on the calculation methodology for the Existing Conditions, Year 10 and Year 30 Projects are provided in **Air Quality Appendix A** and **Appendix B** and **GHG Appendix A.**

[103] Greenhouse gas impacts are, by their nature, cumulative impacts because one project by itself cannot cause global climate change. These thresholds pertain to a project's contribution to cumulative impacts but are labelled "Project-Level Impacts" here to be consistent with the terminology used by BAAQMD.

3.3 Proposed Project

The Proposed Project is seeking to modify Bayer HealthCare LLC's (referred to as "Bayer") long-range development plan for its pharmaceutical manufacturing campus in West Berkeley. The existing development agreement between the City of Berkeley and then Miles Inc. (now Bayer) entered into a 30-year Development Agreement (DA) in 1992 that planned for long-term development and investment in one of the earliest biopharmaceutical manufacturing facilities. The total square feet of development approved by the City of Berkeley in the existing development agreement is 1,886,000 square feet. The Proposed Project contemplates approximately 1,738,000 square feet of development, thereby reducing planned building space by about 148,000 square feet. **Figure 1** in **Air Quality Report Appendix D** shows the location of the Proposed Project and the parcel distribution across the site.

The Project site is comprised of approximately forty-six (46) acres and is roughly bounded by the Union Pacific Railroad right-of -way to the west, Seventh Street to the east, Grayson Street to the south, and Dwight Way to the north together with a separate parking lot, which is located on a portion of the block between Dwight, Seventh, Parker and Sixth Streets. There are three contiguous parcels near the corner of Carleton and Seventh Streets which are not owned by Bayer. The Project site houses biopharmaceutical operations with supporting office and other ancillary uses, and includes two primary areas:

- North Properties: 800 Dwight Way, North of Carleton Street, which is the site included in the 1992 Development Agreement, known as the "North Properties" and
- South Properties: 801 Grayson Street, South of Carleton Street, known as the "South Properties"

The current Project site consists of approximately 1,087,000 square feet divided between the North Properties (567,000 square feet) and the South Properties (520,000 square feet). This existing space represents a partial buildout of space previously approved for the Project site, where the City approved a total of 1,886,000 square feet of development. The Project site's building space is divided into six different land uses, including production space, manufacturing labs, warehouse space, administrative offices, utility facilities, and maintenance facilities. The administration buildings provide offices for management and support functions, conference rooms etc. The manufacturing laboratories provide areas in which research into production and manufacturing technologies can be accomplished. Maintenance provides area to conduct necessary repairs, replacement and preventive maintenance activities in support of site operations. Production uses may include pilot plants, production facilities and fill and finishing facilities. Utility buildings are used to house monitored water distillation operations, electrical equipment and steam generation equipment. Warehouse area is used to hold products for distribution on-site and off-site.

Construction for the Year 10 Project is expected to begin in 2024 with the demolition of some existing buildings in the A-North, C-North and A-South locations of the Project area including buildings B28, B28A, B57, SC-6, B56A, B56B, B56, B84 and B85. This demolition phase will be followed by construction of new buildings in A-North, C-North, A-South and C-South locations. The first phase of construction is expected to end by 2024 and the first year of operations for the newly constructed buildings will be 2025. Conservatively, the GHG impact analysis assumes that the year of full buildout for the Year 10 Project is 2025, even though the second phase of construction for the Year 10 Project is not expected to begin until 2029;

this is conservative because mobile emission factors are expected to decrease in future years. The second phase of construction includes construction in the A-North and B-North locations, and construction is expected to last less than a year ending in 2029.

The Year 10 Project buildout includes development of the Biological Development (BD) Production Buildings, consolidation of administration buildings, expansion of the existing B80 warehouse, expansion of utilities buildings and construction of a parking garage in the C-South location. Further information on the buildings to be construction in Year 10 Buildout are provided in the **Air Quality Appendix A Table CON-1**.

Construction for the Year 30 Project is expected to begin as early as 2034. The Year 30 construction does not include any demolition as all demolition activities will be completed as a part of Year 10 construction. The 20-year phase ("Year 30 Project") is expected to primarily occur in 2034, with a second sub-phase of construction occurring in 2049. Given that the primary phase of construction for Year 30 is expected to end by 2034 and the first year of operations for the newly constructed building is 2035, 2035is the year evaluated for full buildout for the GHG analysis. The first phase includes construction in the A-North and D-North properties such as expansion of the BD production building, construction of the Technology Development Center, construction of the Hub building, and parking garage. The second phase of construction is expected to begin and end in 2049 and it includes construction in the A-North, B-North and A-South properties. The second phase of construction includes expansion of the BD production building, further development of the Technology Development Center, construction of the Cell Culture Technology Center (CCTC) buildings and administration buildings.

3.4 GHG Emissions Inventories

3.4.1 Units of measurement: Tonnes of CO_2 and CO_2e

As discussed in Section 2.1, the term "GHGs" includes gases from fossil fuel use that contribute to the global greenhouse effect, such as CO_2, CH_4, and N_2O, as well as gases that are only man-made and that are emitted through the use of modern industrial products, such as HFCs and CFCs. Water, although a GHG, is not typically evaluated, as water vapor is ubiquitous and typically considered in the context of global feedback loops rather than as an emission from a single project. GHG emissions are typically measured in terms of mass of CO_2e. CO_2e are calculated as the product of the mass of a given GHG and its specific GWP, as described in Section 2.1.[104] 100-year GWPs of 25 and 298, corresponding to the Forth Assessment Report, were used for CH_4 and N_2O, respectively, for this analysis. In many sections of this report, including the final summary sections, emissions are presented in units of CO_2e, either because the GWPs of CH_4 and N_2O were accounted for explicitly, or the CH_4 and N_2O are assumed to contribute a negligible amount of GWP when compared to the CO_2 emissions from that particular emissions category.

California Emission Estimator Model (CalEEMod®) 2016.3.2 uses GWPs from the IPCC Fourth Assessment Report, which is 298 for N_2O and 25 for CH_4. The IPCC also released a Fifth Assessment Report in 2014, which updates the GWPs to 265 and 28 for N_2O and CH_4, respectively.[105] The vast majority of emissions from this Project are CO_2. As a result, small

[104] CalEEMod® 2016.3.2, the primary tool used to develop the emissions inventory uses GWPs from the IPCC Fourth Assessment Report, which is 298 for N_2O and 25 for CH_4.

[105] IPCC. 2014. Climate Change 2014 – Synthesis Report. Available at: https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full_wcover.pdf. Accessed October 13, 2020.

changes in global warming potential for methane CH_4 and N_2O between the various scientific updates provided by the IPCC have a minimal impact on the overall GHG emissions from the Project, and the values used are consistent with CARB's current emissions inventory.[106]

In this report, a tonne refers to MT (1,000 kilograms). Additionally, exact totals presented in all tables and report sections may not equal the sum of components due to independent rounding of numbers.

3.4.2 Indirect GHG Emissions from Electricity Use

Indirect GHG emissions, which occur when electricity is used, are typically due to electricity generation from offsite power plant locations. Electrical power is supplied to the Project area by PG&E or other suppliers including community choice energy (CCE) suppliers such as East Bay Community Energy (EBCE) or direct access providers such as Constellation Energy. In 2002, the State of California passed legislation (Assembly Bill 117) that permits local agencies to form CCE programs for their communities. Under a CCE or direct access program, the utility company (in this case PG&E) continues to operate and service the transmission and delivery system and provides billing and customer service. EBCE provides a 100 percent carbon-free product at a rate equivalent to PG&E's base offering. PG&E also offers 100 percent renewable electricity options.[107]

To estimate emissions, the electricity usage is multiplied by the emission intensity factors for the GHGs. Emission intensity factors are GHG emission rates from a given source in terms of the amount of GHG released (lbs) per Megawatt-hour (MWh) of energy produced. The PG&E CO2e intensity factor as projected for 2020, 2025, and 2035 were used in place of the default carbon intensity in CalEEMod® to calculate emissions for the Existing Conditions building energy and water and for the Year 10 Project and Year 30 Project water supply, treatment, and distribution. Projected electricity intensity factors are based on the State's RPS requirements.[108] , Project Year 10, and Project Year 30, 100 percent of purchased electricity is assumed to be from renewable (carbon-free) energy sources consistent with Bayer's 2030 Sustainability Initiative.[109]. A summary of the electricity intensity factors used in the analysis for natural gas emissions and existing conditions electricity emissions are shown in **Appendix A Table GHG-4.** Year 10 Project and Year 30 Project's 100 percent renewable electricity intensity factor is not reflected in this table.

3.4.3 Existing Conditions Inventory Description

The Existing Conditions scenario presented in this technical report represents the conditions that exist as of 2020. The land uses are shown in **Appendix A Table GHG-1.**

3.4.4 Year 10 and Year 30 Project Inventory Descriptions

This GHG Technical Report evaluates the emissions inventories as described in Section 3.3.

Because California has adopted goals for reducing GHGs by 2030 and regulatory pathways to achieving post-2030 targets become more speculative, the Project emissions inventory is based on adopted regulatory measures (e.g., RPS) and emission factors (e.g., EMFAC2017

[106] CARB. 2020. GHG California Current Emissions Inventory Data. Available at: https://ww2.arb.ca.gov/ghg-inventory-data. Accessed October 13, 2020.

[107] EBCE. 2020. Our Power Mix. Available at: https://ebce.org/our-power-mix/. Accessed: October 21, 2020.

[109] Bayer. 2020. Key Topics: Climate Protection. Available at: https://www.bayer.com/en/sustainability/climate-protection. Accessed: October 21, 2020.

mobile factors with SAFE adjustment), assuming the total operational activity from complete buildout in 2025 for the Year 10 Project and 2035 for the Year 30 Project.

3.4.5 Construction Emissions: Year 10 and Year 30 Project

This section describes the estimation of GHG emissions from construction activities within the Project area. Detailed information on the construction emissions calculations is provided in **Air Quality Report Appendix A.** The major construction phases included in this analysis are:

- Demolition: involves demolishing/removing existing buildings.
- Site Preparation: involves clearing the site of existing debris from demolished buildings.
- Grading: involves the cut and fill of land to ensure the proper base and slope for the construction foundation.
- Paving: involves the laying of concrete or asphalt such as in parking lots or roads.
- Building Construction: involves the construction of structures and buildings.
- Architectural Coating: involves the application of coatings to both the interior and exterior of buildings or structures.

GHG emissions from these construction phases are largely attributable to fuel use from off-road construction equipment and on-road mobile trips from workers, vendors, and hauling vehicles. Average trip length and trips rates are shown for informational purposes as separate line items in the operational mobile emissions tables.

Ramboll used a methodology equivalent to CalEEMod® version 2016.3.2 to quantify the construction emissions. The construction schedule, off-road equipment lists, and equipment specifications are default CalEEMod® activity assumptions based on the acreage of buildings being constructed. The construction schedule was estimated assuming that construction is completed on December 31st of the year before operation is expected to occur. Proposed operational years were provided on a per-building basis by Bayer. The number of days of construction for each phase were determined using CalEEMod® default assumptions based on the acreage of construction. Construction Emissions are shown in **Air Quality Appendix A Table CON-8** for Year 10 Construction and **CON-9** for Year 30 Construction.

3.4.5.1 Vegetation Changes

Permanent vegetation changes that occur as a result of land use development constitute a one-time change in the carbon sequestration capacity of a project site. As described in the EIR Project Description, the project entails the removal of no trees, and it is anticipated that future open space areas would accommodate dozens of trees in open space areas, including along pedestrian and bicycle paths; parking areas, in part to avoid urban heat island effects; and along project frontages so as to enhance the interface between the project site and surrounding community, and promote compatibility. Species of trees and other plants would include native Californian species requiring minimal water supplies. This will result in an overall increase in carbon sequestration once the vegetation reaches a steady state (i.e., new vegetation replaces dying vegetation). Conservatively, no GHG emissions reductions have been quantified for this change in vegetation.

3.4.6 Operational Emissions: Existing Conditions, Year 10, and Year 30 Project

3.4.6.1 Electricity and Natural Gas

Building electricity and natural gas usage rates for the Existing Conditions, Year 10 Project, and Year 30 Project buildings are presented in **Appendix A Table GHG-3.** Existing Conditions electricity and natural gas usage rates are based on historical usage data provided by Bayer. The energy use rate for the total constructed area that has been constructed does not account for 2019 Title 24 standards. Natural gas usage for the Utility land use alone was calculated based on total natural gas consumption from the existing boilers. Further details on the existing and proposed natural gas usage rates are provided below. Parking lighting energy use rates for Existing Conditions and Proposed Project are based on CalEEMod® default estimates since site-level parking energy usage rates were not available.

Year 10 and Year 30 electricity and natural gas usage rates were calculated by assuming a 5% increase in energy use per square foot rates relative to Existing Conditions (except for the Utility land use which remains the same). This 5% increase in energy usage is over and above the two-year annual energy (purchased electricity and natural gas) usage for 2016 – 2017[110]. This is a conservative basis upon which to estimate increases, as the total energy consumed in 2017 was the highest level of energy consumption recorded in the past 5 years. The energy usage dropped after 2017 due to the demolition of energy-intensive production buildings in 2018. While newer buildings are more energy efficient as a result of the California Energy Commission (CEC) standards, the 5% increase also reflects the overall site-level increase in energy usage due to an expected increase in number of employees, increase in production capacity and research intensity without considering efficiencies that would result from new CEC standards.[111] However, factoring in the reductions due to 2019 Title 24 Impact Analysis, consistent with the CEC, we would expect a reduction of 10.7% in electricity usage and 1% in natural gas usage rates. As a result, there is a net decrease in electricity and natural gas usage rates for Year 10 and Year 30. CalEEMod® default enclosed parking structure lighting rates do not incorporate the 2019 Title 24 standards and these rates were reduced by 35% to reflect the 2019 Title 24 Standards. [112, 113, 114]

[110] The total electricity purchased was 196.9 MMBtu/year in 2016 and 200.2 MMBtu/year in 2017, representing a 1.6% increase in electricity consumption. The total natural gas purchased was 2030 MM Gal/year in 2016 and 2128 MM Gal/year in 2017 representing a 4.8% increase in consumption between the two years. Based on these estimates, the increase in energy usage was conservatively assumed to be about 5%.

[111] This increase also accounts for the installation of two new gamma irradiation devices. These devices are rated at 1850 W each and Bayer has estimated that each will operate 1000 minutes per year, resulting in far less than 1 MW per year of electricity consumption or less than 0.0001% of Bayer's baseline electricity usage. This negligible increase in electricity demand would be more than accounted for in the 5% increase in energy use as described above.

[112] Reduction in enclosed parking structure lighting rate was calculated based on lighting power density values (in Watts per square foot) for "Parking Garage Building" in Table 140.6-B of the 2016 and 2019 Building Energy Efficiency Standards.

[113] CEC, 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, June 2015. https://ww2.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf, accessed November 2020.

[114] CEC, 2019 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, December 2018. https://ww2.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf, accessed November 2020.

Since the City of Berkeley has banned the use of natural gas in any newly constructed commercial or residential building (though as discussed in Section 2.2.4, manufacturing labs are excluded), all the new administration, production, maintenance and warehouse buildings are not expected to have natural gas consumption in Year 10 and Year 30; electric appliances will be installed in all these buildings to supply the required energy. The electricity usage in Year 10 and Year 30 account for the increase in electricity use due to switching from natural gas to electric source of energy. The methodology used to account for the electricity increase due to switching from natural gas is approximated by assuming a one-to-one conversion of energy usage from natural gas to electricity.

The electricity intensity factors for Project emissions for Existing Conditions is consistent with PG&E's requirement to acquire 33 percent of energy from renewable sources in 2020. The electricity intensity factors for Year 10 and Year 30 are based on the assumption that Bayer procures 100 percent carbon-free electricity, as described in Section 3.4.2.

Electricity consumption, intensity factors, and emissions are summarized in **Appendix A Tables GHG-3, GHG-4, and GHG-5.**

3.4.6.2 Mobile Sources

GHG emissions associated with on-road mobile sources are generated from workers, visitors, and delivery vehicles visiting the various land use types at Bayer. Mobile source emissions include running exhaust emissions and starting exhaust tailpipe emissions. Running exhaust is dependent on VMT. Starting exhaust is dependent on the number of starts or trips that a vehicle makes. The most recent approved version of CARB's EMission FACtor model (EMFAC2017) was used to calculate the GHG emission factors for each type of fleet in operational years 2020, 2025, and 2035 for the Existing Conditions, Year 10, and Year 30, respectively. Emission factors for CO_2e are estimated using the GWPs from the IPCC Fourth Assessment Report on Climate Change (AR4).[115] The average trip length is based on CalEEMod® default estimates for Alameda County.

Operational emissions calculations for vehicle trips provided by Fehr & Peers.[116] were based on net new trips, i.e., vehicle trips from Existing Conditions were subtracted from estimated vehicle trips associated with the Proposed Projects, as shown in **Appendix A Table GHG-6** and **Table GHG-7**.

3.4.6.3 Emergency Generators

The site currently has six emergency generators ranging in size from 125 kilowatts (kW) to 2,000 kW. Bayer indicated that two of the existing generators would be replaced in Year 10 with two new 2,000 kW diesel generators. The remaining four existing generators would be replaced in Year 30 with three new 2,000 kW diesel generators. BAAQMD has published the Diesel Free By '33 initiative which proposes to eliminate diesel usage by end of 2033. Ramboll conservatively assumed that the new generators installed in Year 30 will be diesel fuelled even though Bayer may commit to other sources of backup power.[117] Hours of operation for existing emergency generators were based on permit limits and it was assumed that annual non-emergency operation will limited to 50 hours for existing and proposed

[115] IPCC. 2007. Fourth Assessment Report on Climate Change. Available at: https://www.ipcc.ch/assessment-report/ar4/. Accessed October 13, 2020.

[116] Fehr & Peers, Bayer Berkeley Project – Transportation Findings. September 29, 2020

[117] BAAQMD. Diesel Free by '33. https://dieselfree33.baaqmd.gov/, accessed October 2020

generators, as stated in the Airborne Toxic Control Measure for Stationary Toxic Compression Ignition Engines (Section 93115,Title 17, CCR). Fuel consumption rates for the proposed generators are based on manufacturer specification sheets. Emissions from the existing generators (Existing Conditions) were subtracted from emissions from the proposed Year 10 and Year 30 generators to obtain net emissions from the Proposed Project. **Table GHG-13 and GHG-14** in **Appendix A c**ontains more information on the generators and emissions.

3.4.6.4 Natural Gas Boilers

Emissions from natural gas boilers were estimated based on the boiler capacity, the total annual operating hours and natural gas consumption rates. The site currently includes three natural gas boilers, one boiler with a capacity of 14.7 MMBtu/hour (350 Brake Horsepower [BHP]) located in B44, and two boilers of capacity 37.8 MMBtu/hour (900 HP) located in B63. The 350 BHP boiler has a utilization rate of 50% and the 900 BHP boilers have a utilization rate of 25%. Boiler specifications for the existing boilers were obtained from BAAQMD permits for the Bayer facility. Existing utilization rates for each of these boilers were provided by Bayer based on historical operations and are expected to remain constant for Year 10 and Year 30. Annual natural gas consumption was calculated by adjusting 8,760 hours of operation per year by the boiler's utilization rate. The site also has two smaller boilers located in B28A that are 0.334 MMBtu/hour and 3.25 MMBtu/hour. These boilers provide heating to the building. These two boilers are exempt from BAAQMD permitting due to their size and capacity. Ramboll did not include the two smaller boilers in emissions estimation as the impacts from these boilers are relatively minor. The natural gas consumed by these boilers to supply heating to building B28A is included in the building energy usage calculations as shown in **Appendix A Table GHG-3** Building natural gas combustion emissions are estimated based on CalEEMod default emission factors which are generally more conservative than boiler emissions. The existing boilers will continue to operate through Year 10 and Year 30 and the two smaller boilers will be relocated to building B82 in Year 10. The steam consumption for Year 10 and Year 30 are projected to increase by roughly 17% compared to existed permitted levels. In Year 10, an additional boiler of size 400 BHP will be added in order to accommodate this increase in usage. The 17% increase in steam usage is based on the increase in engine horsepower by 400 BHP from the current configuration which operates one 350 HP boiler and two 900 HP boiler to service the site with a boiler efficiency of 80%, plus other ancillary gas usage.[118] The utilization rates and emissions for the Boilers are shown in **Appendix A Table GHG-15 and Tables GHG-16** for the Existing Conditions, Year 10 and Year 30 Operations.

3.4.6.5 Waste

Indirect GHG emissions associated with waste disposal include CH_4 generation from the decomposition of waste and the CO_2 emissions associated with the combustion of CH_4, if applicable.

GHG emission estimates for the Existing Conditions inventory are based on Bayer's waste generation rates. The waste generation rate per employee is defined by the total solid waste generation for the Existing Conditions scenario divided by the total number of current employees. Waste sent to landfill include both non-hazardous (i.e. shredded paper, plastics,

[118] The 17% increase in natural gas usage is calculated as the increase in BHP rating for all boilers based on the total BHP rating for the existing boilers (2,150 BHP) and proposed increase in rating for Boilers in Year 10 and Year 30 (2,550 BHP) with a boiler efficiency of 80% as ((2550 – 2150)/2150)*0.8 =~15%. The increase in natural gas usage also includes other ancillary gas usage.

residual trash) and hazardous (i.e. chemical and medical waste) materials. The same landfill emission factors are applied to hazardous and non-hazardous waste. Recycling waste includes metals, wood, cardboards, and e-waste. Sodium hydroxide, lab packs and parts washer are also recycled. Composting waste includes food waste and other compostable materials such as green waste. Incinerated waste includes hazardous chemical and pharmaceutical waste.

Waste disposal emissions are calculated based on solid waste landfill gas (LFG) treatment types and emission factors, obtained from CalEEMod® User's Guide Appendix D. Incinerated waste emissions are based on the methodology described in the IPCC Emissions from Waste Incineration[119].

For Year 10 and Year 30, the solid generation rates were calculated based on the Existing Conditions rates and the proposed employee count, provided by Bayer.

Emissions are summarized in **Appendix A Tables GHG-11** and **GHG-12**

3.4.6.6 Water Use and Emissions

Indirect GHG emissions result from the production of electricity used to convey, treat, and distribute water and wastewater. The amount of electricity required to convey, treat, and distribute water depends on the volume of water as well as the sources of the water.

GHG emissions associated with water use are based on actual data provided by Bayer for the Existing Conditions. For the Year 10 and Year 30 scenarios, water usage and wastewater generation values are assumed to be the same as Existing use. Water electricity intensity was obtained from CalEEMod® defaults for Alameda County, which are based on a study commissioned by the CEC.[120] This study published recommended electricity intensities for the supply and conveyance, treatment and distribution of water, as well as treatment of wastewater, for Northern and Southern California. There are no assumed changes for Year 10 and Year 30, though a reduction in emissions occurs given the reduction in electricity intensity Year 10 and Year 30.

Wastewater treatment types and direct emission types are based on CalEEMod® defaults. All indoor water is assumed to be processed as wastewater. Outdoor water usage accounts for landscaping and water evaporation.

The PG&E electricity emission factors described in Section 3.4.2 are used to estimate GHG emissions per kilowatt-hour, since it is assumed that the electricity from the conveyance, treatment, and distribution comes from PG&E. Electricity emissions for water supply, treatment, and distribution are accounted for along with direct emissions from wastewater treatment.

Emissions from water use are shown in **Air Quality Tables GHG-8, GHG-9,** and **GHG-10**

3.4.6.7 Landscaping Equipment

In addition to the main inventory items described above, GHG emissions were also added based on landscaping equipment using CalEEMod® default information and square footage

[119] IPCC. 2013. Emissions From Waste Incineration Publication. https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/5_3_Waste_Incineration.pdf. Accessed October 13, 2020.

[120] CEC. 2006. Refining Estimates of Water-Related Energy Use in California. Available at: http://large.stanford.edu/courses/2012/ph240/spearrin1/docs/CEC-700-2005-011-SF.PDF. Accessed October 13, 2020

for Existing Conditions, Year 10 and Year 30 Project. Emissions are shown in **Air Quality Table GHG-2**

3.5 Impact Evaluation

3.5.1 Impact GHG-1

Impact GHG-1: The Project Would Not Generate Greenhouse Gas Emissions, either Directly or Indirectly, that Would Make A Cumulatively Considerable Contribution to Global Climate Change (Less than Significant)

As described in **Section 3.4**, this analysis quantified Existing and Project emissions based on historical and projected activity and usage data. Emissions include all existing sources along with the incremental change expected due to the buildout of the Project. This analysis shows a decrease in total annual GHG mass emissions from Existing to Project; and shows that the increase in stationary source emissions is less than BAAQMD's stationary source threshold. **Table 1 summarizes the emissions by sector.**

Table 1. Greenhouse Gas Emissions Summary[a]

Emissions category	Existing Conditions	Year 10 Project	Year 30 Project
Electricity	6,392	0	0
Building Natural Gas	1,392	585	741
Mobile Sources	4,248	5,618	6,308
Solid Waste	465	697	929
Water and Wastewater	84	79	71
Landscaping	0.054	0.033	0.049
Construction (Amortized)[b]	0	30.7	31.6
Non-Stationary Source Total Emissions	**12,582**	**7,009**	**8,081**
Change from Existing Conditions	**--**	**-5,573**	**-4,500**
De Minimis Threshold	--	0	0
Exceeds Threshold?	**--**	**No**	**No**
Emergency Generators	237	355	353
Boiler Natural Gas	12,213	19,681	19,681
Stationary Source Total Emissions	**12,450**	**20,036**	**20,034**
Change from Existing Conditions	**--**	**7,586**	**7,584**
Stationary Source Threshold	--	10,000	10,000
Exceeds Threshold?	**--**	**No**	**No**

Notes:
a. Emissions from AQ Appendix A Table CON-8, CON-9 and Appendix A.
b. Construction emissions have been amortized over 30 years.

Figure 1 shows the change in total emissions (not including stationary sources) from the Existing Conditions to each Project buildout year, with the conservative threshold set to no

net increase. As shown in Figure 1, total mass GHG emissions decrease from the Existing to the Project, which demonstrates that the Project results in no net increase to GHG emissions. **Figure 2** shows the change in stationary source GHG emissions from the Existing Conditions to each Project buildout year. As shown in Figure 2, the change in stationary source emissions is less than the stationary source threshold.

Figure 1. Summary of Non-Stationary GHG Emissions

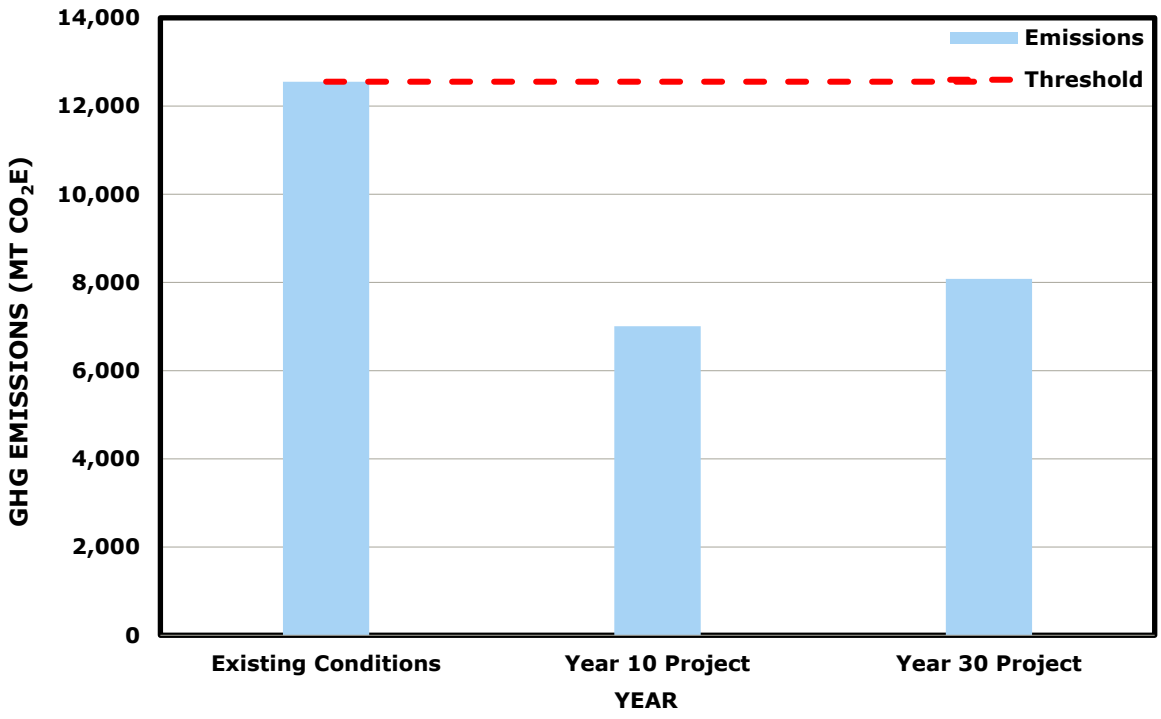
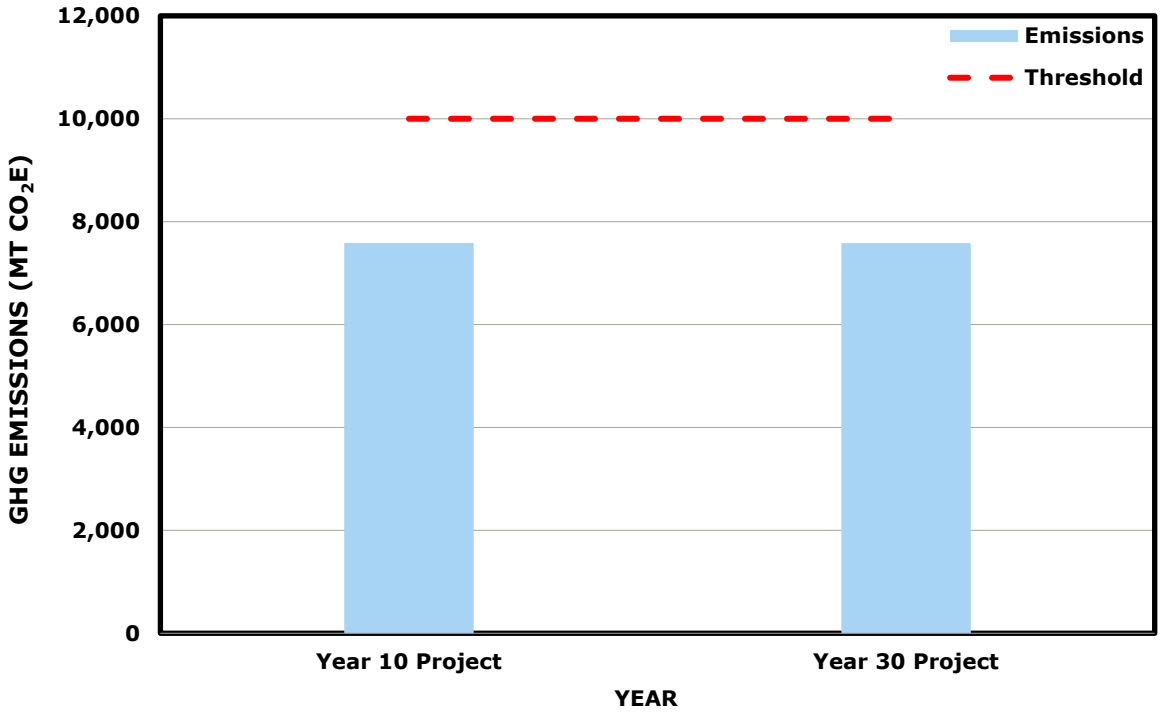


Figure 2. Summary of Net Change in Stationary Source Emissions



Relative to Threshold 1 described in **Section 3.1.3**, this impact is *Less Than Significant.*

3.5.2 Impact GHG-2

Impact GHG-2: The Project Would Be Consistent with AB 32, the CARB Scoping Plan, the Region's Sustainable Communities Strategy/ Regional Transportation Plan (Plan Bay Area), Executive Order S-3-05, Executive Order B-16-12, Executive Order B-55-18, and SB 32. (Less than Significant)

The Project has been evaluated for consistency with the following plans, policies, and regulations:

- AB 32 (California Global Warming Solutions Act of 2006), including:
  - CARB Scoping Plan
- Plan Bay Area
- Executive Order S-3-05
- Executive Order B-30-15
- Executive Order B-55-18
- SB 32

Each plan, policy, and regulation is described in detail in Section 2.2, above. A discussion of Project consistency with each plan, policy, and regulation is presented below.

AB 32

The heart of the California Global Warming Solutions Act of 2006 (AB 32) is the requirement for statewide GHG emissions to be reduced to 1990 levels by 2020. The Project would be consistent with this mandate based on the net decrease in emissions, as described in the preceding impact analysis. AB 32 also required the adoption of discrete Early Action Items which resulted in the development of the Low Carbon Fuel Standard, among other things. Further, AB 32 required the development of a Scoping Plan for achieving the necessary GHG reductions in a technologically and economically feasible manner, the adoption of a mandatory GHG emissions reporting regulation, and the establishment of a market-based declining emission limit program (i.e., the cap-and-trade program). The Scoping Plan and GHG Reporting Regulations are discussed below. Bayer does not directly emit more than 25,000 MT CO_2e annually, so California Cap-and-Trade requirements do not apply to it.

CARB Scoping Plan

The AB 32 Scoping Plan identifies over 70 measures for reducing GHG emissions to 1990 levels by 2020. Specific measures discussed in the Scoping Plan that are relevant to the Project include the Renewables Portfolio Standard (RPS) and Advanced Clean Cars program.

The RPS requires retail sellers of electricity to achieve 33% renewable energy sources by 2020. While Bayer is not a regulated entity under the RPS, the electricity that Bayer purchases from those suppliers reflects the use of renewable sources as required to comply with the RPS.

The Advanced Clean Cars Program applies to vehicle manufacturers. While Bayer is not a regulated entity under this regulation, the vehicles used by Bayer employees, visitors, and contractors will reflect the GHG emission limits required by the regulation. Implementation of these regulations combined with the LCFS will reduce the campus's vehicular GHG emissions.[121] Additional emissions reductions will result from installation of electric vehicle chargers.

Mandatory Greenhouse Gas Emissions Reporting Regulations

The State of California and federal mandatory GHG emissions reporting regulations require facilities exceeding a specified threshold of GHG emissions to report their emissions inventory. Both regulations require reporting of emissions from stationary combustion. This does not include non-stationary combustion sources such as from vehicle travel and trucking or indirect emissions from water and electricity usage. Further, the California regulation requires emissions reports to be verified by a third party if emissions exceed 25,000 MT CO_2e. Bayer submits its emissions inventory reports to ARB. Because Bayer does not directly emit more than 25,000 MT CO_2e annually, third-party verification, California Cap-and-Trade, and Federal reporting requirements do not apply.

Plan Bay Area

SB 375, the Sustainable Communities and Climate Protection Act of 2008, supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning. SB 375 required CARB to establish GHG emission reduction targets (Regional Targets) for each metropolitan planning region. On September 23, 2010, CARB

[121] Note that due to the federal adoption of the Final SAFE Rule (described in section 2.2.1.2), new cars of model years 2021 through 2026 are not currently required to achieve the fuel economy targets set by the Advanced Clean Cars program.

adopted Regional Targets applying to the years 2020 and 2035.[122] In 2011, CARB adopted Regional Targets of 7% for 2020 and 15% for 2035 for the area under ABAG's jurisdiction, which includes the Project site. These targets were in place through September 30, 2018. In March 2018, CARB approved updated regional targets of 10% for 2020 and 19% for 2035 for MTC/ABAG, which will be applied by MTC/ABAG in future planning cycles.

SB 375 requires MPOs including the ABAG to incorporate a SCS in their RTPs that will achieve the GHG emission Reduction Targets set by CARB, primarily by reducing VMT from light-duty vehicles through development of more compact, complete, and efficient communities. Plan Bay Area 2040 constitutes the RTP/SCS for the Bay Area. Plan Bay Area 2040 adopted 13 performance targets focused on climate protection, adequate housing, healthy and safe communities, open space and agricultural preservation, equitable access, economic vitality, and transportation system effectiveness.[123] Development of the next version of this plan, Plan Bay Area 2050, is underway and will include the following four key issues: the economy, the environment, housing, and transportation.[124]

The Project is located in an existing urban area. In addition, it will continue to implement a Transportation Demand Management Program as described further in the Project Description. The Project will continue to implement the shuttle system which runs from the Ashby BART Station and the Bayer site, and is used by approximately 120 people daily. In addition to shuttle services, the program reduces single-occupancy vehicle use through a combination of pre-tax benefits, bicycle commuting incentives, and telecommuting options for qualified employment positions.

Executive Order B-30-15 and SB 32

In April 2015, Governor Brown signed Executive Order B-30-15, which established the following GHG emission reduction goal for California: by 2030, reduce GHG emissions to 40 percent below 1990 levels. This Executive Order also directed all state agencies with jurisdiction over GHG-emitting sources to implement measures designed to achieve the new interim 2030 goal, as well as the pre-existing, long-term 2050 goal identified in Executive Order S-3-05 (see discussion below). Additionally, the Executive Order directed CARB to update its Scoping Plan to address the 2030 goal. SB 32 codifies the 2030 emissions reduction goal of Executive Order B-30-15 requiring CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030.

The Project's 2035 emissions total represents the emissions inventory for the Project at full build-out. As explained in the preceding impact analysis, the Project emissions would be lower than the Existing emissions. Several regulatory requirements reduce the Project's emissions and help ensure that the State's 2030 GHG target is achieved, including the following:

- SB 100 requires retail sellers of electric services to increase procurement from eligible renewable energy resources to 60% by 2030 (from 33% by 2020).

[122] ARB. 2010. Sustainable Communities. http://www.arb.ca.gov/cc/sb375/sb375.htm. Accessed October 13, 2020.

[123] MTC/ABAG. 2020. Plan Bay Area 2040 Goals and Targets. Available at: https://www.planbayarea.org/2040-plan/plan-details/goals-and-targets. Accessed: November 17, 2020.

[124] MTC/ABAG. 2020. Plan Bay Area 2050. Available at: https://www.planbayarea.org/plan-bay-area-2050. Accessed: November 17, 2020.

- Under SB 375, CARB adopted Regional Targets of 15% reduction in VMT for 2035 for the area under ABAG's jurisdiction, which includes the Project site. The MTC and ABAG approved the final Plan Bay Area, which establishes strategies for meeting the Bay Area's Regional Targets.
- The Advanced Clean Cars Program will reduce GHG emissions by nearly 35% for new cars of model years 2017-2025.[125]
- CPUC, CEC, and CARB have a shared, established goal of achieving ZNE.
- Executive Order N-82-20 sets targets for State ZEV sales to increase to 100% of new light- and medium-duty vehicle sales by 2035.

The measures above will all help ensure that the State meets the 2030 GHG target. The Project will be consistent with all of these initiatives and regulatory requirements.

Executive Order S-3-05 and B-55-18

This report also evaluates the Project's consistency with Executive Order No. S-3-05's goal of reducing the State's GHG emissions to 80 percent below the 1990 level by the year 2050; and Executive Order No. B-55-18's goal of reducing the State's GHG emissions to net carbon neutral by the year 2045 and maintain net negative emissions thereafter. Based on existing emissions trends, the Project's emissions are expected to decline from 2030 through at least 2050 due to continued regulatory and technological advancements. Therefore, the Project is unlikely to obstruct the attainment of the State's long-term GHG reduction goal for 2045 or 2050.

Prior to passage of AB 32 in 2004, California was emitting 12 percent more GHG emissions than in 1990.[126] For California to emit 80 percent less than it emitted in 1990, the statewide GHG emissions would be only 18 percent of the 2004 statewide GHG emissions. Accounting for a population growth from 35,840,000 people in 2004 to approximately 55,000,000 people in 2050, the emissions per capita would have to be only 12 percent of what they were in 2004. This means 88 percent reductions in per capita GHG emissions from 2004 emissions intensities must be realized in order to achieve California's 2050 GHG goals. The reductions need be even more stringent to meet the 2045 goals. Clearly, energy efficiency and reduced VMT will play important roles in achieving this aggressive goal, but the decarbonization of fuel will also be necessary.

The extent to which GHG emissions from mobile sources indirectly attributed to the Project will change in the future depends on the quantity (e.g., number of vehicles, average daily mileage) and quality (i.e., carbon content) of fuel that will be available and required to meet both regulatory standards and workers' needs. In addition, renewable power requirements, low carbon fuel standards, and vehicle emissions standards discussed above will all decrease GHG emissions per unit of energy delivered or per vehicle mile travelled. Due to the technological shifts required and the unknown parameters of the regulatory framework in

[125] Note that due to the federal adoption of the Final SAFE Rule (described in section 2.2.1.2), new cars of model years 2021 through 2026 are not currently required to achieve the fuel economy targets set by the Advanced Clean Cars program.

[126] CARB. 2007. California Greenhouse Gas Inventory – By IPCC Category. 1990-2004 Inventory. Available at: https://ww3.arb.ca.gov/cc/inventory/archive/tables/ghg_inventory_ipcc_90_04_sum_2007-11-19.pdf. Accessed October 13, 2020.

2050, quantitatively analyzing a Project's impacts further relative to the 2050 target are speculative for purposes of CEQA.

That being said, studies have shown that, in order to meet the 2050 target, aggressive technology changes in the transportation and energy sectors, such as electrification and maturation of technologies still in development (e.g., advanced batteries and more efficient biofuels), will be required.[127] One recent study indicated that, even with these emerging technologies, the 2050 goal will not be met, due to the population growth to 55 million by 2050.[128] A more recent study, however, shows that the existing and proposed regulatory framework will allow the State to reduce GHG emissions to 40 percent below 1990 levels by 2030, and to 60 percent below 1990 by 2050.[129] Even though this study did not provide a regulatory and technology roadmap to achieve the Governor's 2050 goal, it demonstrated that various combinations of policies could allow Statewide emissions to remain very low through 2050, suggesting that the combination of new technologies and other regulations not analyzed in the study could allow the State to meet the Governor's 2050 goal. In August 2020, Energy + Environmental Economics (E3) developed modeling scenarios for CARB that demonstrate potential pathways for the State to achieve the 2045 and 2050 targets. These scenarios all require ambitious reductions including "high levels of energy efficiency across all sectors, high levels of renewable electricity generation, high levels of electrification in the transportation and buildings sector, and deep reductions in non-energy, non-combustion GHG emissions like methane CH_4 and HFCs. As a result, all scenarios achieve at least an 80% reduction in gross GHG emissions (under AB 32) by 2045".[130]

While it would be speculative to quantitatively estimate the Project's emissions level in 2045 and 2050 and to assess the impacts to the Executive Order's horizon-year goals, statewide efforts are underway to facilitate the State's achievement of these goals and it is reasonable to expect the Project's emissions level to decline as the regulatory initiatives identified by CARB in the First Update to the Climate Change Scoping Plan and 2017 Scoping Plan are implemented, and other technological innovations occur. Many of these initiatives include reducing the carbon content of motor fuels and fuels for electricity generation. Reducing the carbon content of motor fuels and fuels for electricity generation will reduce CO_2e emissions from this Project over time. Stated differently, the Project's emissions total at build-out represents the maximum emissions inventory for the Project as California's emissions sources are being regulated (and foreseeably expected to continue to be regulated in the future) in furtherance of the State's environmental policy objectives. Given the reasonably anticipated decline in Project emissions once fully constructed and operational, the Project is consistent with the Executive Orders horizon-year goals.

[127] Lawrence Berkeley National Laboratory (LBL). 2011. California's Energy Future – The View to 2050. May. Available at: http://ccst.us/publications/2011/2011energy.php. Accessed: October 13, 2020.

[128] LBL. 2013. Estimating Policy-Driven Greenhouse Gas Emissions Trajectories in California: The California Greenhouse Gas Inventory Spreadsheet (GHGIS) Model. Available at: https://eta.lbl.gov/publications/estimating-policy-driven-greenhouse. Accessed: October 13, 2020.

[129] Jeffery Greenblatt. 2015. Modeling California Impacts on Greenhouse Gas Emissions. Energy Policy. Volume 78, March 2015, pages 158-172. Abstract available at: http://www.sciencedirect.com/science/article/pii/S0301421514006892. Accessed: October 13, 2020.

[130] E3. 2020. Achieving Carbon Neutrality in California: PATHWAYS Scenarios Developed for the California Air Resources Board. Available at: https://ww2.arb.ca.gov/sites/default/files/2020-08/e3_cn_draft_report_aug2020.pdf. Accessed: October 13, 2020.

For example, CARB's First Update to the Scoping Plan "lays the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050." And many of the emission reduction strategies recommended by CARB would serve to reduce the Project's post-2020 emissions level to the extent applicable by law:

- Energy Sector: Continued improvements in California's appliance and building energy efficiency programs and initiatives would serve to reduce the Project's emissions level. Additionally, further additions to California's renewable resource portfolio would favorably influence the Project's emissions level.
- Transportation Sector: Anticipated deployment of improved vehicle efficiency, zero emission technologies, lower carbon fuels, and improvement of existing transportation systems all will serve to reduce the Project's emissions level.
- Water Sector: The Project's emissions level will be reduced as a result of further desired enhancements to water conservation technologies.
- Waste Management Sector: Plans to further improve recycling, reuse and reduction of solid waste will beneficially reduce the Project's emissions level.

In addition to CARB's First Update, in January 2015, during his inaugural address, Governor Jerry Brown expressed a commitment to achieve "three ambitious goals" that he would like to see accomplished by 2030 to reduce the State's GHG emissions: (1) increasing the State's RPS from 33 percent in 2020 to 50 percent in 2030; (2) cutting the petroleum use in cars and trucks in half; and, (3) doubling the efficiency of existing buildings and making heating fuels cleaner. Two of these expressions of Executive Branch policy – (1) and (3) – already have been manifested in adopted legislative action (i.e., SB 350). SB 100 further increased the emissions reductions for (1), while Governor Newsom's 2020 EO N-79-20 sets the stage to improve upon the target set in (2).

In summary, because the Project meets and exceeds the emissions reduction targets presented in this report for earlier years, and because many aspects of the Project's emissions inventory will benefit from further regulatory and technological advancements, the Project is not expected to obstruct the attainment of the Governor's long-term GHG reduction goal for 2050. As described further in the Project Description, the Project will include electrification of building energy systems, heating, and appliances to the extent feasible; land use and site enhancements to enable the use of zero-emission transportation; and waste mitigation. Therefore, the Project's impacts are **less than significant** under this methodology.

APPENDIX A

Table GHG-1
Land Use Summary for Existing Conditions and Proposed Project
Bayer CEQA Long Range Development Project
Berkeley, California

Land Use[1]	CalEEMod® Land Use	Total Area		
		Size	Units	Total Square Footage (sf)
Existing Conditions (2020)[2]				
Administration	General Office Building	191	ksf	191,000
Manufacturing Labs	Research & Development	220	ksf	220,000
Maintenance	General Light Industry	13	ksf	13,000
Production	Manufacturing	348	ksf	348,000
Warehouse	Refrigerated Warehouse - No Rail	254	ksf	254,000
Utility	General Heavy Industry	61	ksf	61,000
Parking[3]	Parking Lot	1,720	spaces	767,120
Parking[3]	Enclosed Parking with Elevator	0	spaces	0
Total Existing Conditions Square Footage (Excluding Parking)				**1,087,000**
Project - Year 10[4]				
Administration	General Office Building	214	ksf	214,000
Manufacturing Labs	Research & Development	180	ksf	180,000
Maintenance	General Light Industry	18	ksf	18,000
Production	Manufacturing	548	ksf	548,000
Warehouse	Refrigerated Warehouse - No Rail	157	ksf	157,000
Utility	General Heavy Industry	71	ksf	71,000
Parking	Parking Lot	370	spaces	165,020
Parking	Enclosed Parking with Elevator	830	spaces	370,180
Total Project - Year 10 Square Footage (Excluding Parking)				**1,188,000**
Project - Year 30[4]				
Administration	General Office Building	284	ksf	284,000
Manufacturing Labs	Research & Development	230	ksf	230,000
Maintenance	General Light Industry	18	ksf	18,000
Production	Manufacturing	978	ksf	978,000
Warehouse	Refrigerated Warehouse - No Rail	157	ksf	157,000
Utility	General Heavy Industry	71	ksf	71,000
Parking	Parking Lot	70	spaces	31,220
Parking	Enclosed Parking with Elevator	1,750	spaces	780,500
Total Project - Year 30 Square Footage (Excluding Parking)				**1,738,000**

Notes:

1. Land types for the Project were provided by Bayer, based on Table in Section C.2 of the Project Description.
2. Square footage for the existing condition accounts for the existing built development on the North Property and South Property (1,087,000 sf) without the parking square footage.
3. Parking is listed in the existing and proposed DA as a separate land use category, but is treated for purposes of environmental review as an ancillary use to the primary land uses.
4. Land use square footage for Year 10 and Year 30 operations were obtained from the land use summary table in Section C.1 of the Project Description, provided by Bayer.

Abbreviations:

CEQA - California Environmental Quality Act

ksf - 1,000 square feet

sf - square feet

RAMBOLL

Table GHG-2
Landscaping Emissions for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Land use	Emissions from Landscaping Equipment[1]
	CO_2e
	(MT/yr)
Existing Conditions	0.054
Project - Year 10	0.033
Project - Year 30	0.049

Notes:

1. Landscape emissions calculated using CalEEMod® 2016.3.2 based on information regarding building square footage and acreage, shown in Appendix D.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO_2e - carbon dioxide equivalents
MT - metric ton(s)

References:

CalEEMod® Version 2016.3.2 Available Online at: http://www.caleemod.com

Table GHG-3
Energy Usage for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Land Use	CalEEMod® Land Use	Total Constructed Area (sf)[1]	Annual Electricity Use (MWh/yr)	Annual Natural Gas Use (MMBtu/yr)
Existing Conditions[1]				
Administration	General Office Building	191,000	1,956	7,997
Manufacturing Labs	Research & Development	220,000	9,302	12,344
Maintenance	General Light Industry	13,000	109	272
Production	Manufacturing	348,000	24,411	0
Warehouse	Refrigerated Warehouse - No Rail	254,000	3,279	5,323
Utility[2]	General Heavy Industry	61,000	18,156	228,386
Parking	Parking Lot	767,120	268	0
Parking	Enclosed Parking with Elevator	0	0	0
	Existing Conditions Usage[1]		57,482	254,322

Land Use	CalEEMod® Land Use	Total Area (sf)	Annual Electricity Use (MWh/yr)	Annual Natural Gas Use[4] (MMBtu/yr)
Project - Year 10[3]				
Administration	General Office Building	214,000	4,785	0
Manufacturing Labs	Research & Development	180,000	7,136	10,498
Maintenance[5]	General Light Industry	18,000	256	678
Production	Manufacturing	548,000	36,044	0
Warehouse	Refrigerated Warehouse - No Rail	157,000	2,903	0
Utility[2]	General Heavy Industry	71,000	19,814	368,040
Parking	Parking Lot	165,020	61	0
Parking	Enclosed Parking with Elevator	370,180	1,481	0
	Total Project - Year 10 Usage[3,6]		72,480	379,217

Land Use[1]	CalEEMod® Land Use	Total Area (sf)	Annual Electricity Use (MWh/yr)	Annual Natural Gas Use[4] (MMBtu/yr)
Project - Year 30[4]				
Administration	General Office Building	284,000	6,350	0
Manufacturing Labs	Research & Development	230,000	9,119	13,415
Maintenance[5]	General Light Industry	18,000	256	678
Production	Manufacturing	978,000	64,327	0
Warehouse	Refrigerated Warehouse - No Rail	157,000	2,903	0
Utility[2]	General Heavy Industry	71,000	19,814	368,040
Parking	Parking Lot	31,220	11	0
Parking	Enclosed Parking with Elevator	780,500	3,122	0
	Total Project - Year 30 Usage[3,6]		105,902	382,133

Table GHG-3
Energy Usage for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Notes:

1. Current site-level electricity and natural gas usage rates were provided by Bayer. Energy use rates per square foot by land use type were calculated by dividing the total energy usage rate per land use type by the square footage of building area for each land use category, except Utility. The Existing Conditions usage was then calculated as the product of energy usage per square foot multiplied by the total square footage by land use type analyzed in the Existing Conditions. Parking energy use rates alone were are based on CalEEMod® defaults. Annual natural gas usage rates for Uility land use type are based on the boiler natural gas energy consumption rates. Further details are provided in footnote #2.

2. The Existing conditions annual natural gas usage rate for the Utility land use type was calculated based on the total natural gas consumption from the existing boilers based on utilization rates provided by Bayer. The existing natural gas boilers will continue to operate through Year 10 and Year 30. See Table GHG-16 for natural gas energy usage calculations. The boilers are housed in Buildings B63 and B44 which are the only utility buildings that consume natural gas. All other utility buildings have zero natural gas usage. The Project will include an additional Boiler of size 400 BHP included as a part of Year 10 operations, installed in building B46.

3. Electricity and natural gas usage for Year 10 and Year 30 is expected to increase by 5% for all land use types except Utility. The increase in energy usage is applied to the energy use rate per square footage. However, factoring in the reductions due to 2019 Title 24 Impact Analysis, consistent with the California Energy Commission (CEC), we would expect a reduction of 10.7% in electricity usage and 1% in natural gas usage, in addition to the increase from existing usage. Enclosed parking structure lighting rates were reduced by 35% to reflect the 2019 Title 24 Impact Analysis.

4. The City of Berkeley has banned the use of natural gas in any newly constructed commercial or residential building (manufacturing is excluded). All the new administration, maintenance and warehouse buildings are not expected to have natural gas consumption in Year 10 and Year 30, and all the natural gas devices will be replaced with electric appliances. The electricity usage in Year 10 and Year 30 account for the increase in electricity use due to switching from natural gas to electric appliances. The methodology used to account for the electricity increase due to switching from natural gas is approximated by assuming a one-to-one conversion of energy in BTU.

5. The existing B47 maintenance building alone will continue to use natural gas usage. All new maintenance buildings are replacing natural gas with electricity.

6. Two new gamma irradiation devices are expected to be installed in Year 10 and operate through Year 30. These devices are rated as 1850 W each and Bayer has estimated that each will operate 1000 minutes per year, resulting in far less than 1 MW per year of electricity consumption, or less than 0.0001% of Bayer's baseline electricity usage. Thus, these devices were not explicitly included in the above table and are expected to be more than accounted for in the land-use specific energy use rates.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CEC - California Energy Commission
CEQA - California Environmental Quality Act
MWh - megawatt-hour
MMBtu - million British Thermal Units
sf - square feet

References:

CalEEMod® Version 2016.3.2 Available Online at: http://www.caleemod.com

California Energy Commission. 2019. Building Energy Efficiency Standards for Residential and Nonresidential Buildings. Available online at: https://www.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf

California Energy Commission. 2019. Impact Analysis for 2019 Energy Efficiency Standards. Available online at: https://ww2.energy.ca.gov/title24/2019standards/post_adoption/

City of Berkeley. Ordinance No 7,672-N.S. Chapter 12.80. Prohibition of Natural Gas Infrastructure in New Buildings. Available online at: https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/2019-07-23%20Item%20C%20Prohibiting%20Natural%20Gas%20Infrastructure.pdf

U.S. Environmental Protection Agency. Energy Star website. Accessed April 17, 2019. https://www.energystar.gov/products/lighting_fans/light_fixtures/why_choose_energy_star_qualified_led_lighting

Table GHG-4
Energy Usage Emission Factors for Minimally Compliant Utility Energy
Bayer CEQA Long Range Development Project
Berkeley, California

Historical Electricity Intensity - PG&E

Annual Electricity Data	2016	2017	2018	Average[1]	Units
CO_2 Intensity Factor per Total Energy Delivered[2]	294	210	206	237	lbs CO_2/MWh delivered
% of Total Energy From RPS-Eligible Renewables[3]	33%	33%	39%	35%	-
CO_2 Intensity Factor per Total Non-RPS-Eligible Energy[4]	437	314	338	363	lbs CO_2/MWh delivered

Greenhouse Gas Energy Emission Factors

Greenhouse Gas	CO_2	CH_4	N_2O	CO_2e	Units
Global Warming Potential[6]	1.0	25	298	-	-
2020 Electricity Use Emission Factor[7]	243	0.033	0.0040	245	lb/MWh
	0.11	1.5E-05	1.8E-06	0.11	MT/MWh
2025 Electricity Use Emission Factor (RPS 44%) [7]	203	0.033	0.0040	205	lb/MWh
	0.092	1.5E-05	1.8E-06	0.093	MT/MWh
2035 Electricity Use Emission Factor (RPS 60%) [7]	145	0.033	0.0040	147	lb/MWh
	0.066	1.5E-05	1.8E-06	0.067	MT/MWh
Natural Gas Use Emission Factor[8]	118	0.0023	0.0022	118	lb/MMBTU
	0.0053	1.0E-07	9.8E-08	0.0054	MT/therm

Notes:

1. Total CO_2 intensity factors from The Climate Registry. Available at: https://www.theclimateregistry.org/our-members/cris-public-reports/.
2. Percent of total energy from eligible renewables is from the PG&E 2017, 2018, and 2019 Corporate Responsibility Report.
3. This average uses the most recent three years of data.
4. The emissions metric presented here is calculated based on the total CO_2 intensity factor divided by the percent of energy delivered from non-RPS-eligible renewable sources. This CO2 intensity factor includes both fossil fuel and carbon-free sources of energy, such as largescale hydro and nuclear. Diablo Canyon Nuclear Plant, which accounts for a portion of the carbon-free energy in this CO_2 intensity factor, is planned to be closed by 2024-2025 (https://www.pge.com/en_US/safety/how-the-system-works/diablo-canyon-power-plant/diablo-canyon-power-plant/engagement-panel.page). According to SB 1090 (approved 9/2018), "The [California Public Utilities] commission shall ensure that integrated resource plans are designed to avoid any increase in emissions of greenhouse gases as a result of the retirement of the Diablo Canyon Units 1 and 2 powerplant." This was incorporated into CPUC section 712.7(2)(b). Based on this information, the total Non-RPS-Eligible energy CO_2 intensity factor was assumed to remain constant.
5. The intensity factor for total energy delivered is estimated by multiplying the percentage of energy delivered from non-RPS-eligible renewable energy by the CO_2 emissions per total non-RPS-eligible renewable energy metric calculated above.
6. Global Warming Potentials (GWP) are based on the IPCC Fourth Assessment Report. CH_4 and N_2O emission factors are from the CalEEMod® version 2016.3.2 defaults for PGE, and are conservatively assumed not to change from these estimates. As more renewable energy is integrated into the electricity grid, these intensity factors will also decrease.
7. The intensity factor for total energy delivered is estimated by multiplying the percentage of energy delivered from non-renewable energy by the CO_2 emissions per total non-renewable energy metric calculated above. The estimate provided here and the energy reports issued by PG&E assume that renewable energy sources do not result in any CO_2 emissions. For the Year 10 Project and Year 30 Project, it is assumed that Bayer purchases 100% carbon-free electricity for building energy use; but the factors shown here are used for water supply.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CH_4 - methane
CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalents
CPUC - California Public Utilities Commission
GWP - global warming potential
IPCC AR4 - Intergovernmental Panel on Climate Change
lb - pound(s)
MMBtu - million British Thermal Units
MT - metric ton(s)
MWh - megawatt-hour
N_2O - nitrous oxide
PG&E - Pacific Gas & Electric
RPS - Renewable Portfolio Standard
SB - Senate Bill

References:

California Air Pollution Control Officers Association (CAPCOA). California Emissions Estimator Model (CalEEMod®), Version 2016.3.2. Available online at http://www.caleemod.com/

IPCC. 2007. AR4 Climate Change 2007: The Physical Science Basis. Available online at: https://www.ipcc.ch/report/ar4/wg1/

PG&E 2017 Corporate Responsibility Report. Available at: http://pgecorp.com/corp_responsibility/reports/2017/assets/PGE_CRSR_2017.pdf. Accessed: April 2020.

PG&E 2018 Corporate Responsibility Report. Available at: http://www.pgecorp.com/corp_responsibility/reports/2018/assets/PGE_CRSR_2018.pdf. Accessed: April 2020

PG&E 2019 Corporate Responsibility Report. Available at: http://www.pgecorp.com/corp_responsibility/reports/2019/assets/PGE_CRSR_2019.pdf. Accessed: April 2020

The Climate Registry. Available at: https://www.theclimateregistry.org/our-members/cris-public-reports/. Accessed: April 2020.

SB-100 California Renewables Portfolio Standard Program. Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100.

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Table GHG-5
Energy Usage Emissions for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Location	Land Use Type	Natural Gas Combustion Emissions[1]	Electricity Emissions[2]
		CO_2e (MT/yr)	CO_2e (MT/yr)
Existing Conditions			
Administration	General Office Building	429	218
Manufacturing Labs	Research & Development	0,663	1,034
Maintenance	General Light Industry	15	12
Production	Manufacturing	0	2,715
Warehouse	Refrigerated Warehouse - No Rail	286	365
Utility	General Heavy Industry	12,213	2,019
Parking	Parking Lot	0	30
Parking	Enclosed Parking with Elevator	0	0
	Total Existing Emissions	**13,605**	**6,392**
Project - Year 10			
Administration	General Office Building	0	0
Manufacturing Labs	Research & Development	564	0
Maintenance	General Light Industry	21	0
Production	Manufacturing	0	0
Warehouse	Refrigerated Warehouse - No Rail	0	0
Utility	General Heavy Industry	19,681	0
Parking	Parking Lot	0	0
Parking	Enclosed Parking with Elevator	0	0
	Total Emissions (Year 10)	**20,265**	**0**
Project - Year 30			
Administration	General Office Building	0	0
Manufacturing Labs	Research & Development	720	0
Maintenance	General Light Industry	21	0
Production	Manufacturing	0	0
Warehouse	Refrigerated Warehouse - No Rail	0	0
Utility	General Heavy Industry	19,681	0
Parking	Parking Lot	0	0
Parking	Enclosed Parking with Elevator	0	0
	Total Emissions (Year 30)	**20,422**	**0**

Project Emissions[3]	Natural Gas Emissions	Electricity Emissions
	CO_2e (MT/yr)	CO_2e (MT/yr)
Total Year - 10 Project Emissions	6,660	-6,392
Total Year - 30 Project Emissions	6,817	-6,392

Table GHG-5
Energy Usage Emissions for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Notes:

1. GHG emissions from natural gas usage are based on the energy use rates shown in Table GHG-3 and natural gas use emission factors shown in Table GHG-4 for all land use types. The natural gas emissions from Utility are quantified in Table GHG-16 based on the GHG emissions for boilers. Boiler GHG emissions should not be double counted with the GHG emissions from the utility land use type shown in Table GHG-3 and natural gas GHG emission factors shown in Table GHG-4.

2. GHG emissions from electricity are calculated based on electricity usage rate shown in Table GHG-3, and energy emission factors, shown in Table GHG-4. Electricity emissions for Project - Year 10 and Project - Year 30 are based on Bayer's commitment to 100% carbon-free electricity.

3. Project natural gas and electricity emissions are calculated as the Year 10 or Year 30 emissions minus the Existing Conditions emissions. Overall, project electricity emissions are negative because there is a reduction in square footage for Year 10 compared to the Existing Conditions, and there is a decrease in electricity emissions in future years due to commitment to 100% carbon-free electricity.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO_2e - carbon dioxide equivalents
GHG - Greenhouse Gas
MT - metric ton(s)

References:

California Emissions Estimator Model (CalEEMod®). Available online at http://www.caleemod.com/

Table GHG-6
Fleet Mix Assumptions
Bayer CEQA Long Range Development Project
Berkeley, California

Existing Conditions

Vehicle Type	Percentage of Fleet Mix[1]	% by Fuel Type[1]			
		Gas	Diesel	Natural Gas	Electric
HHDT	4.3%	0.058%	99%	0.79%	0%
LDA	56%	96%	1.1%	0%	2.4%
LDT1	5.4%	100%	0.035%	0%	0.36%
LDT2	18%	99%	0.62%	0%	0.49%
LHDT1	2.2%	62%	38%	0%	0%
LHDT2	0.50%	39%	61%	0%	0%
MCY	0.52%	100%	0%	0%	0%
MDV	11%	97%	2.3%	0%	0.23%
MH	0.067%	76%	24%	0%	0%
MHDT	2.2%	9%	91%	0%	0%
OBUS	0.14%	53%	47%	0%	0%
SBUS	0.030%	27%	73%	0%	0%
UBUS	0.19%	0.64%	87%	11%	1.3%

Project - Year 10

Vehicle Type	Percentage of Fleet Mix[1]	% by Fuel Type[1]			
		Gas	Diesel	Natural Gas	Electric
HHDT	4.6%	0.044%	99%	0.89%	0%
LDA	56%	95%	1.1%	0%	4.1%
LDT1	5.4%	98%	0.022%	0%	1.6%
LDT2	17%	98%	0.83%	0%	1.4%
LHDT1	2.1%	56%	44%	0%	0%
LHDT2	0.53%	34%	66%	0%	0%
MCY	0.51%	100%	0%	0%	0%
MDV	11%	96%	2.9%	0%	1.4%
MH	0.067%	73%	27%	0%	0%
MHDT	2.4%	8%	92%	0%	0%
OBUS	0.13%	44%	56%	0%	0%
SBUS	0.035%	39%	61%	0%	0%
UBUS	0.18%	0.64%	81%	19%	0%

Table GHG-6
Fleet Mix Assumptions
Bayer CEQA Long Range Development Project
Berkeley, California

Project - Year 30

Vehicle Type	Percentage of Fleet Mix[1]	% by Fuel Type[1]			
		Gas	Diesel	Natural Gas	Electric
HHDT	5.0%	0.038%	99%	0.89%	0%
LDA	56%	93%	1.1%	0%	5.9%
LDT1	5.4%	97%	0.013%	0%	3.4%
LDT2	17%	96%	0.97%	0%	2.8%
LHDT1	2.1%	52%	48%	0%	0%
LHDT2	0.55%	29%	71%	0%	0%
MCY	0.49%	100%	0%	0%	0%
MDV	11%	94%	3.3%	0%	3.2%
MH	0.068%	70%	30%	0%	0%
MHDT	2.6%	8%	92%	0%	0%
OBUS	0.13%	35%	65%	0%	0%
SBUS	0.043%	54%	46%	0%	0%
UBUS	0.16%	0.64%	71%	29%	0%

Notes:

1. Fleet mixes and percentages by fuel type are calculated based on EMFAC2017 vehicle miles traveled projections for Alameda County.

Abbreviations:

CEQA - California Environmental Quality Act
EMFAC2017 - EMission FACtor model
HHDT - heavy-heavy duty truck
LDA - light-duty automobile
LDT1 - light-duty truck (smaller)
LDT2 - light-duty truck (larger)
LHDT1 - light-heavy-duty truck (smaller)
LHDT2 - light-heavy-duty truck (larger)
MCY - motorcycle
MDV - medium-duty truck
MH - motor home
MHDT - medium heavy-duty truck
OBUS - other bus
PRRA - public reuse and recycling area
SBUS - school bus
UBUS - urban bus

References:

ARB. 2017. Emission FACtors Model, 2017 (EMFAC2017). Available online at: https://www.arb.ca.gov/emfac/

Table GHG-7
Mobile Emissions
Bayer CEQA Long Range Development Project
Berkeley, California

Inputs

Trip Rates[1]	Existing Conditions	2,410	trips/day
	Project - Year 10	3,620	trips/day
	Project - Year 30	4,830	trips/day
Average Trip length[2]		12	mi/trip

Scenario	**Emission Factor Units**[4]	**Mobile Emission Factors**[3]			
		GHGs			
		CO_2	**CH_4**	**N_2O**	**CO_2e**
Existing Conditions	g/mi	399	0.0090	0.023	406
	g/trip	110	0.071	0.038	123
Project - Year 10	g/mi	351	0.0072	0.020	357
	g/trip	102	0.048	0.031	113
Project - Year 30	g/mi	295	0.0069	0.017	300
	g/trip	87	0.027	0.025	95

Scenario	**Mobile Emissions**			
	GHGs (MT/yr)[5]			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Existing Conditions	4,166	0.16	0.26	4,248
Project - Year 10	5,512	0.17	0.34	5,618
Project - Year 30	6,188	0.19	0.39	6,308

Scenario	**Mobile Emissions**
	GHGs (MT/yr)[6]
	CO_2e
Total Year - 10 Project Emissions	1,370
Total Year - 30 Project Emissions	2,060

Notes:

1. Trip rates were provided by the Fehr & Peers, as outlined in the Transportation Memo.
2. The average trip length is based on CalEEMod default estimates for Alameda County.
3. Emission factors were estimated using EMFAC2017 for Alameda County.
4. Emission factors from EMFAC with units of g/vehicle/day were converted to g/trip by scaling by the ratio of the total number of vehicles divided by the total number of trips for each vehicle class, fuel type, and year.
5. Emission factors for CO_2e were estimated by multiplying the CH_4 and N_2O emission factors by their global warming potentials from the IPCC 4th Assessment Report on Climate Change (AR4).
6. Project mobile emissions are calculated as the Year 10 or Year 30 emissions minus the Existing Conditions emissions.

Abbreviations:

CH_4 - methane
CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalent
EMFAC2017 - California Air Resources Board EMission FACtor model
g - gallon(s)
GHG - greenhouse gas
IPCC - Intergovernmental Panel on Climate Change
mi - mile
N_2O - Nitrous oxide

References:

California Emissions Estimator Model (CalEEMod®). Available online at http://www.caleemod.com/
IPCC. 2007. 4th Assessment Report on Climate Change. Available online at: https://www.ipcc.ch/assessment-report/ar4/

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Table GHG-8
Water Usage and Treatment Emission Factors for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Water Usage[1]

Land Use	CalEEMod® Land Use Subtype	Indoor Water (million gal/year)	Outdoor Water[2] (million gal/year)
Existing Conditions			
Manufacturing Labs (B57)	Research & Development	0.10	1.4
Production (B60)	Manufacturing	24	2.7
Production (B66)	Manufacturing	2.2	0.88
Production (B81)	Manufacturing	7.0	1.2
Rest of Facility	Mixed	4.7	19
Project - Year 10[3]			
Manufacturing Labs (B57)	Research & Development	0.10	1.4
Production (B60)	Manufacturing	24	2.7
Production (B66)	Manufacturing	2.2	0.88
Production (B81)	Manufacturing	7.0	1.2
Rest of Facility	Mixed	4.7	19
Project - Year 30[3]			
Manufacturing Labs (B57)	Research & Development	0.10	1.4
Production (B60)	Manufacturing	24	2.7
Production (B66)	Manufacturing	2.2	0.88
Production (B81)	Manufacturing	7.0	1.2
Rest of Facility	Mixed	4.7	19

Water Electricity Intensity[4]

County	Electricity to Supply Water (kWh/million gal)	Electricity to Treat Water (kWh/million gal)	Electricity to Distribute Water (kWh/million gal)
Alameda	2,117	111	1,272

Notes:

1. Water usage was provided by Bayer.
2. All buildings are expected to use water for landscaping. Outdoor water use includes water used for landscaping and water that is evaporated.
3. Water usage for Year 10 and Year 30 are assumed to be same as Existing water usage.
4. Water Electricity Intensity from Table 9.2 of Appendix D of the CalEEMod® User's Guide. There is no assumed reduction in water intensity for Year 10 and Year 30, even though a reduction is likely given the reduction in electricity intensity.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
gal - gallon
kWh - kilowatt-hours

References:

CalEEMod® Version 2016.3.2 Available Online at: http://www.caleemod.com

Table GHG-9
Wastewater Treatment Emission Factors
Bayer CEQA Long Range Development Project
Berkeley, California

Wastewater Electricity Intensity[1]

County	Wastewater Treatment (kWh/million gal)
Alameda	1,911

Wastewater Treatment Types[2]

County	Septic Tank	Aerobic	Anaerobic, Facultative Lagoons	Anaerobic, Combustion of Gas	Anaerobic, Cogeneration of Gas
Alameda	10.33%	87.46%	2.2%	100%	0%

Wastewater Treatment Direct Emission Factors[3]

Wastewater Treatment Type	CO_2 Biogenic (ton/gal)	CH_4 (ton/gal)	N_2O (ton/gal)
Septic	0	2.5E-07	8.5E-10
Aerobic	3.9E-07	1.3E-09	8.5E-10
Anaerobic Facultative	3.9E-07	4.0E-07	8.5E-10
Digester Burn	0	0	0
Digester Cogen	0	0	0

Notes:

1. Water Electricity Intensity from Table 9.2 of Appendix D of the CalEEMod® User's Guide.
2. Water Treatment Types from Table 9.3 of Appendix D of the CalEEMod® User's Guide.
3. Wastewater Treatment Direct Emission Factors from Table 9.4 of Appendix D of the CalEEMod® User's Guide.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CH_4 - methane
CO_2 - carbon dioxide
gal - gallon
kwh - kilowatt
N_2O - nitrous oxide

References:

CalEEMod® Version 2016.3.2 Available Online at: http://www.caleemod.com

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Table GHG-10
Water Usage and Wastewater Emissions for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Land Use	CalEEMod® Land Use Type	Water Usage Emissions	Wastewater Treatment Emissions		
		Electricity Indirect Emissions (MT CO_2e/yr)	Septic Tank Direct Emissions (MT CO_2e/yr)	Aerobic Direct Emissions (MT CO_2e/yr)	Facultative Lagoon Direct Emissions (MT CO_2e/yr)
Existing Conditions					
Manufacturing Labs (B57)	Research & Development	0.62	0.060	0.053	0.021
Production (B60)	Manufacturing	15	15	13	5.1
Production (B66)	Manufacturing	1.7	1.4	1.2	0.47
Production (B81)	Manufacturing	4.7	4.3	3.8	1.5
Rest of Facility	Mixed	10	2.9	2.5	1.0
Total Existing Conditions Emissions		**33**	**23**	**20**	**8.1**
Project - Year 10					
Manufacturing Labs (B57)	Research & Development	0.52	0.060	0.053	0.021
Production (B60)	Manufacturing	13	15	13	5.1
Production (B66)	Manufacturing	1.4	1.4	1.2	0.47
Production (B81)	Manufacturing	3.9	4.3	3.8	1.5
Rest of Facility	Mixed	8.5	2.9	2.5	1.0
Total Emissions (Year 10)		**27**	**23**	**20**	**8.1**
Project - Year 30					
Manufacturing Labs (B57)	Research & Development	0.37	0.060	0.053	0.021
Production (B60)	Manufacturing	9.2	15	13	5.1
Production (B66)	Manufacturing	1.01	1.4	1.2	0.47
Production (B81)	Manufacturing	2.8	4.3	3.8	1.5
Rest of Facility	Mixed	6.1	2.9	2.5	1.0
Total Emissions (Year 30)		**20**	**23**	**20**	**8.1**

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Table GHG-10
Water Usage and Wastewater Emissions for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Project Emissions[3]	Water Usage Emissions	Wastewater Treatment Emissions			Total GHG Emissions from Water Usage
	Electricity Indirect Emissions	Septic Tank Direct Emissions	Aerobic Direct Emissions	Facultative Lagoon Direct Emissions	
	(MT CO_2e/yr)	(MT CO_2e/yr)	(MT CO_2e/yr)	(MT CO_2e/yr)	(MT CO_2e/yr)
Total Year 10 - Project Emissions	-5.3	0	0	0	-5.3
Total Year 30 - Project Emissions	-13	0	0	0	-13

Notes:

1. Emissions shown in this table were calculated using default values and methods from CalEEMod® Version 2016.3.2. These calculations were performed using water use rates (shown in Table GHG-8), wastewater emission factors (shown in Table GHG-9), and energy emission factors (shown in Table GHG-4).
2. Indoor water use is assumed to be processed as wastewater. Outdoor water use is assumed to not be processed as wastewater.
3. Project water emissions are calculated as the Year 10 or Year 30 emissions minus the Existing Conditions emissions.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO_2e - carbon dioxide equivalents
MT - metric ton
yr - year

References:

California Emissions Estimator Model (CalEEMod®). Available online at http://www.caleemod.com/

Table GHG-11
Solid Waste Generation for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Solid Waste Generation per Employee[1]

Waste Disposal Method	Non-Hazardous Waste Disposal Rate (ton/employee/year)	Hazardous Waste Disposal Rate (ton/employee/year)	Total Solid Waste Disposal Rate (ton/employee/year)
Landfill	0.81	0.064	0.87
Recycling	0.51	0.0127	0.53
Compost	0.37	--	0.37
Incineration	--	0.063	0.063

Scenario	Number of Employees
Existing Conditions	1,000
Project - Year 10	1,500
Project - Year 30	2,000

Total Solid Waste Generation[1]

Waste Disposal Method	Non-Hazardous Waste Disposal Rate (ton/year)	Hazardous Waste Disposal Rate (ton/year)	Total Solid Waste Disposal Rate (ton/year)
Existing Conditions[1]			
Landfill[2]	805	64	869
Recycling[3]	515	13	528
Compost[4]	366	--	366
Incineration[5]	--	63	63
% Diverted from Landfilling through Recycling and Composting			51%
Project - Year 10[6]			
Landfill	1208	96	1304
Recycling	772	19	791
Compost	549	--	549
Incineration	--	94	94
% Diverted from Landfilling through Recycling and Composting			51%
Project - Year 30[7]			
Landfill	1611	128	1738
Recycling	1030	25	1055
Compost	732	--	732
Incineration	--	125	125
% Diverted from Landfilling through Recycling and Composting			51%

Notes

1. Solid waste generation rates for the Existing Conditions scenario were provided by Bayer. The waste generation rate per employee was calculated by dividing the total solid waste generation amount for existing condition by the total number of employees.
2. Waste that is sent to landfill includes include both non-hazardous waste such as shredded paper, plastics, residual trash, and hazardous waste including some chemical and medical waste. The same landfill emission factors are applied to hazardous waste and non-hazardous waste.
3. Waste that is recycled includes metals, wood, cardboard, and e-waste. Chemicals that are being recycled includes sodium hydroxide, lab packs and parts washer.
4. Waste that is composted includes food waste and other compost.
5. Hazardous waste that is incinerated includes some chemicals and pharmaceutical waste.
6. Solid waste generation rates for the Project - Year 10 and Project - Year 30 scenarios were calculated using the solid waste generation rates per employee and the proposed employee count, as provided by Bayer.

Table GHG-12
Solid Waste Emissions for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Solid Waste Landfill Gas (LFG) Treatment Types[1]

County	Landfill, No Gas Capture	Landfill, Capture Gas Flare	Landfill Gas Capture Efficiency	Landfill Gas Control Efficiency
Alameda	6%	94%	75%	98%

Solid Waste Landfill Gas Emission Factors[2]

Description	CO_2 Emissions (ton/ton waste)	CH_4 Emissions (ton/ton waste)
No LFG Collection	0.14	0.043
LFG Collect and Combust	0.23	0.011

Solid Waste Incineration Inputs[3]

Description	Value	Unit
Average Climate-Relevant CO_2	0.42	Mg CO_2/Mg Waste
Average N_2O Concentration	32	mg/m^3
Exhaust Gas Volume (Dry)	7,104	m^3/Mg Waste

Solid Waste Emissions[4]

Waste Disposal Method[5]	CO_2 (MT/year)	CH_4 (MT/year)	N_2O (MT/year)	CO_2e (MT/year)
Existing Conditions				
Landfill	176	10	--	437
Incineration	24	--	0.013	27
Total Existing Conditions Emissions	**200**	**10**	**0.013**	**465**
Project - Year 10				
Landfill	265	15.6	--	656
Incineration	35	--	0.019	41
Total Emissions (Year 10)	**300**	**15.6**	**0.019**	**697**
Project - Year 30				
Landfill	353	21	--	874
Incineration	47	--	0.026	55
Total Emissions (Year 30)	**400**	**21**	**0.026**	**929**

Table GHG-12
Solid Waste Emissions for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Project Emissions	Total GHG Emissions From Waste Disposal (MT CO2e/year)
Total Year 10 - Project Emissions	232
Total Year 30 - Project Emissions	465

Notes:

1. Solid Waste Landfill Gas Treatment Types from Appendices A and D, Table 10.1, to CalEEMod® User's Guide.
2. Solid Waste Landfill Gas Emission Factors from Table 10.2 of CalEEMod® User's Guide Appendix D.
3. Solid Waste Incineration inputs are based on the methodology described in the IPCC Emissions From Waste Incineration Publication. https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/5_3_Waste_Incineration.pdf
4. Emissions are calculated using data presented above and in Table GHG-11.
5. The amount of waste disposed will be reduced by the percentage diverted via recycling or composting, consistent with CalEEMod® methodology. There is no reallocation of the type of material disposed.
6. Project waste emissions are calculated as the Year 10 or Year 30 emissions minus the Existing Conditions emissions.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CH_4 - methane
CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalents
IPCC - Intergovernmental Panel on Climate Change
LFG - Landfill Gas
m^3 - cubic meter
mg - milligram
MG - megagram
MT - metric ton
N_2O - nitrous oxide

References:

California Emissions Estimator Model (CalEEMod®). Available online at http://www.caleemod.com/
IPCC. Emissions from Waste Incineration.
Available online at https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/5_3_Waste_Incineration.pdf

Table GHG-13
Generator Information and Emission Factors
Bayer CEQA Long Range Development Project
Berkeley, California

Generator Information and Emission Factors

Name	Generator Size Range		Generator Building	Fuel Consumption[1] (gal/hr)	Operating Hours[2] (hr/yr)	Emission Factors[3] (kg/gal)		
	kW	bhp				CO_2	CH_4	N_2O
Existing Conditions								
9098X01	125	192	B54	8.0	20	10	4.1E-04	8.3E-05
9098X05	600	890	B57	45	20	10	4.1E-04	8.3E-05
9098X06	2,000	2,841	B61	145	50	10	4.1E-04	8.3E-05
9098X07	2,000	2,682	B61	136	50	10	4.1E-04	8.3E-05
9098X14	2,000	2,848	B61	133	50	10	4.1E-04	8.3E-05
9098X17	350	519	B28/B28A	27	50	10	4.1E-04	8.3E-05
Year 10								
9098X01	125	192	B54	8.0	20	10	4.1E-04	8.3E-05
9098X06	2,000	2,841	B61	145	50	10	4.1E-04	8.3E-05
9098X07	2,000	2,682	B61	136	50	10	4.1E-04	8.3E-05
9098X14	2,000	2,848	B61	133	50	10	4.1E-04	8.3E-05
Proposed Gen 1	2,000	2,937	B82	138	50	10	4.1E-04	8.3E-05
Proposed Gen 2	2,000	2,937	B82	138	50	10	4.1E-04	8.3E-05
Year 30								
Proposed Gen 3	2,000	2,937	B82	138	50	10	4.1E-04	8.3E-05
Proposed Gen 4	2,000	2,937	B82	138	50	10	4.1E-04	8.3E-05
Proposed Gen 5	2,000	2,937	B61	138	50	10	4.1E-04	8.3E-05
Proposed Gen 6	2,000	2,937	B61	138	50	10	4.1E-04	8.3E-05
Proposed Gen 7	2,000	2,937	B61	138	50	10	4.1E-04	8.3E-05

Notes:

1. Fuel consumption values are for Existing Conditions are obtained from facility data and represent fuel consumption at 100% load. Fuel consumption rates for the proposed generators are based on equipment manufacture sheets.

Table GHG-13
Generator Information and Emission Factors
Bayer CEQA Long Range Development Project
Berkeley, California

Notes, Continued:

2. Annual operating hours for the existing generators are obtained from the BAAQMD permit for the Bayer facility. Operating hours for the proposed generators are based on BAAQMD's permit limit of 50 hours per year for testing and maintenance operations.

3. CO_2, CH_4, and N_2O emission factor based on emission factors from EPA Mandatory Reporting Rule (MRR), 40 CFR 98, Table C-1 & C-2, converted to kg/gal based on the Higher Heating Value (HHV) of 138 MMBtu/1000 gal from EPA MMR, 40 CFR 98, Table C-1.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District

CARB - California Air Resources Board

CH_4 - methane

CO_2 - carbon dioxide

EPA - United States Environmental protection Agency

g - grams

gal - gallon

bhp - brake horsepower

hr - hour

HHV - high heating value

References

BAAQMD guidance available at: http://www.baaqmd.gov/pmt/bactworkbook/default.htm

EPA Mandatory Reporting Rule (MRR), 40 CFR 98, Table C-1 & C-2. Accessed online at: https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=1436db1e1e4f6e1ddff3037fbc0c969a&mc=true&n=sp40.23.98.c&r=SUBPART&ty=HTML.

MDAQMD guidance available at: http://mdaqmd.ca.gov/home/showdocument?id=722

BAAQMD. 2004. CARB Emission Factors for CI Diesel Engines - Percent HC in Relation to NMHC + NO_x.

California Air Resources Board Non-road Diesel Engine Certification Tier Chart. Available online at: https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart

Intergovernmental Panel on Climate Change (IPCC), Fifth Assessment Report (AR5), 2014.

USEPA. 2010. Conversion Factors for Hydrocarbon Emission Components, NR-002d. EPA-420-R-10-015. July. Available online at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P1002KA8.PDF?Dockey=P1002KA8.PDF

Table GHG-14
Generator Emissions for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Generator Emissions[1]

Name	Emissions (MT/yr)			
	CO_2	CH_4	N_2O	CO_2e
Existing Conditions				
9098X01	1.6	6.6E-05	1.3E-05	1.6
9098X05	9.1	3.7E-04	7.4E-05	9.2
9098X06	74	0.0030	6.0E-04	74
9098X07	69	0.0028	5.6E-04	70
9098X14	68	0.0028	5.5E-04	68
9098X17	14	5.7E-04	1.1E-04	14
Total	236	0.010	0.0019	237
Year 10				
9098X01	1.6	6.6E-05	1.3E-05	1.6
9098X06	74	0.0030	6.0E-04	74
9098X07	69	0.0028	5.6E-04	70
9098X14	68	0.0028	5.5E-04	68
NewGen1	70	0.0029	5.7E-04	71
NewGen2	70	0.0029	5.7E-04	71
Total	354	0.014	0.0029	355
Year 30				
NewGen1	70	0.0029	5.7E-04	71
NewGen2	70	0.0029	5.7E-04	71
NewGen3	70	0.0029	5.7E-04	71
NewGen4	70	0.0029	5.7E-04	71
NewGen5	70	0.0029	5.7E-04	71
Total	352	0.014	0.0029	353

Notes

1. Generator emissions are calculated based on the generator information and emission factors in Table GHG-13.

Abbreviations:

CH_4 - methane
CO_2 - carbon dioxide
N_2O- nitrous oxide
yr - year

Table GHG-15
Emission Factors for Natural Gas Boilers
Bayer CEQA Long Range Development Project
Berkeley, California

Boiler Information and Emission Factors

Capacity (MMBtu/hour)[1]	Size	Name	Emissions Factor (lb/MMScf)[2]		
	BHP		CO_2	CH_4	N_2O
Existing Conditions					
14.7	350	S34	120,000	2.3	0.64
37.8	900	S10	120,000	2.3	0.64
37.8	900	S11	120,000	2.3	0.64
Year 10 and Year 30					
14.7	350	S34	120,000	2.3	0.64
37.8	900	S10	120,000	2.3	0.64
37.8	900	S11	120,000	2.3	0.64
15.94	400	NEW	120,000	2.3	0.64

Notes

1. The capacity and size of each existing boiler was obtained from the BAAQMD permits for the Bayer facility. The capacity and size of the proposed boiler (NEW) was estimated by Bayer based on steam production requirements for Year 10 and Year 30. The site also currently includes two smaller boilers (3.25 MMBTU/hour and 0.334 MMBTU/hour) to supply heating to building B28. The natural gas consumed by these boilers to supply heating to building B28 is included in the building energy usage calculations as shown in Table GHG-3. Building natural combustion emissions are estimated based on CalEEMod default emission factors which are generally more conservative, as shown in Table GHG-4. These two boilers will be relocated to building B82 in Year 10.

2. Emission factors for greenhouse gases were obtained from AP-42 Chapter 1.4, Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion. Low-NOx burner emission factor used for N_2O. Note that AP-42 emission factors are consistent with BAAQMD Permit Handbook Guidance.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CEQA - California Environmental Quality Act
CH_4 - methane
CO_2 - carbon dioxide
EPA - United States Environmental protection Agency
g - grams
bhp - brake horsepower
hr - hour
MMBTU - million British thermal unit
N_2O- nitrous oxide
yr - year

References

BAAQMD guidance available at: http://www.baaqmd.gov/pmt/bactworkbook/default.htm

USEPA. AP-42 Chapter 1.4 Natural Gas Combustion. Available at: https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf

Table GHG-16
Boiler Emissions for Existing Conditions and Project Operations
Bayer CEQA Long Range Development Project
Berkeley, California

Boiler Emissions[1]:

Capacity (MMBtu/hour)	Name	Heat Content (Btu/scf)	Utilization (%)	Operating Hours (hr/yr)	Fuel Consumed (scf/year)	Emissions (MT/year)			
						CO_2	CH_4	N_2O	CO_2e
Existing Conditions									
14.7	S34	1,020	50%	8,760	63,123,529	3,436	0.066	0.018	3,443
37.8	S10	1,020	25%	8,760	80,392,157	4,376	0.084	0.023	4,385
37.8	S11	1,020	25%	8,760	80,392,157	4,376	0.084	0.023	4,385
					Total	12,188	0.23	0.065	12,213
Project - Year 10									
14.7	S34	1,020	50%	8,760	63,123,529	3,436	0.066	0.018	3,443
37.8	S10	1,020	25%	8,760	80,392,157	4,376	0.084	0.023	4,385
37.8	S11	1,020	25%	8,760	80,392,157	4,376	0.084	0.023	4,385
15.94	NEW	1,020	100%	8,760	136,916,120	7,452	0.14	0.040	7,468
					Total	19,640	0.38	0.10	19,681
Project - Year 30									
14.7	S34	1,020	50%	8,760	63,123,529	3,436	0.066	0.018	3,443
37.8	S10	1,020	25%	8,760	80,392,157	4,376	0.084	0.023	4,385
37.8	S11	1,020	25%	8,760	80,392,157	4,376	0.084	0.023	4,385
15.94	NEW	1,020	100%	8,760	136,916,120	7,452	0.14	0.040	7,468
					Total	19,640	0.38	0.10	19,681

Notes

1. Boiler emissions are calculated based on the boiler information and emission factors in Table GHG-15. The existing boilers S10, S11 and S34 will remain in operation through Year 10 and Year 30, and thus emissions from these three boilers remain the same. In Year 10, a fourth boiler (NEW) will be added to B46 and it is assumed to operate at the same capacity in Year 30, thus emissions for Year 10 and Year 30 are constant.

Abbreviations:

btu - British thermal unit
CEQA - California Environmental Quality Act
CH_4 - methane
CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalent
hr - hour
MMBTU - million british thermal unit
MT - metric ton
N_2O- nitrous oxide
scf -standard cubic feet
yr - year

RAMBOLL

Table GHG-17
Summary of Operational GHG Emissions
Bayer CEQA Long Range Development Project
Berkeley, California

Emissions Category[1]	GHG Emissions (MT/year)[2]		
	Existing Conditions	Year 10 Project	Year 30 Project
Electricity	6,392	0	0
Building Natural Gas[3]	1,392	585	741
Mobile Sources	4,248	5,618	6,308
Solid Waste	465	697	929
Water and Wastewater	84	79	71
Landscaping	0.054	0.033	0.049
Construction (Amortized)	0	30.7	31.6
Non-Stationary Source Total Emissions	**12,582**	**7,009**	**8,081**
Change from Existing Conditions	**--**	**-5,573**	**-4,500**
Emergency Generators	237	355	353
Boiler Natural Gas	12,213	19,681	19,681
Stationary Source Total Emissions	**12,450**	**20,036**	**20,034**
Change from Existing Conditions	**--**	**7,586**	**7,584**

Notes:

1. Operational emissions were estimated with methodology equivalent to CalEEMod® 2016.3.2 based on site-specific information.
2. Greenhouse gas emissions are estimated assuming global warming potentials consistent with ARB MRR guidance.
3. Emissions for natural gas usage represents emissions from the building energy usage. Natural gas usage rate for the utility boilers are reported separately.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CalEEMod® - California Emissions Estimator Model®
CEQA - California Environmental Quality Act
GHG - Greenhouse Gases
MRR - Mandatory GHG Reporting Regulation

APPENDIX B

Bayer - Baseline - GHG

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	191.00	1000sqft	4.38	191,000.00	0
Research & Development	220.00	1000sqft	5.05	220,000.00	0
General Heavy Industry	61.00	1000sqft	1.40	61,000.00	0
General Light Industry	13.00	1000sqft	0.30	13,000.00	0
Manufacturing	348.00	1000sqft	7.99	348,000.00	0
Refrigerated Warehouse-No Rail	254.00	1000sqft	5.83	254,000.00	0
Enclosed Parking with Elevator	0.00	1000sqft	0.00	0.00	0
Parking Lot	1,720.00	Space	15.48	767,120.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	243	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Energy intensity factors based on data for PG&E from The Climate Registry and RPS reductions

Land Use - Land use square footage updated to match updated baseline for CEQA

Construction Phase -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Grading -

Vehicle Trips -

Consumer Products -

Area Coating -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	543,500.00	842,136.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	1,630,500.00	2,526,408.00
tblAreaCoating	Area_Nonresidential_Exterior	543500	842136
tblAreaCoating	Area_Nonresidential_Interior	1630500	2526408
tblLandUse	LandUseSquareFeet	688,000.00	767,120.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	243
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	VendorTripNumber	304.00	402.00
tblTripsAndVMT	WorkerTripNumber	738.00	978.00
tblTripsAndVMT	WorkerTripNumber	148.00	196.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2020											0.0000	667.9702	667.9702	0.1640	0.0000	672.0702
2021											0.0000	2,542.5387	2,542.5387	0.1691	0.0000	2,546.7662
2022											0.0000	2,488.0877	2,488.0877	0.1625	0.0000	2,492.1499
2023											0.0000	2,417.8342	2,417.8342	0.1456	0.0000	2,421.4737
2024											0.0000	2,395.3711	2,395.3711	0.1439	0.0000	2,398.9683
2025											0.0000	579.9453	579.9453	0.0526	0.0000	581.2601
Maximum											**0.0000**	**2,542.5387**	**2,542.5387**	**0.1691**	**0.0000**	**2,546.7662**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020											0.0000	667.9696	667.9696	0.1640	0.0000	672.0696
2021											0.0000	2,542.5383	2,542.5383	0.1691	0.0000	2,546.7659
2022											0.0000	2,488.0873	2,488.0873	0.1625	0.0000	2,492.1495
2023											0.0000	2,417.8338	2,417.8338	0.1456	0.0000	2,421.4733
2024											0.0000	2,395.3708	2,395.3708	0.1439	0.0000	2,398.9680
2025											0.0000	579.9451	579.9451	0.0526	0.0000	581.2600
Maximum											**0.0000**	**2,542.5383**	**2,542.5383**	**0.1691**	**0.0000**	**2,546.7659**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e

Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	0.0502	0.0502	1.3000e-004	0.0000	0.0535
Energy											0.0000	2,779.1816	2,779.1816	0.2276	0.0482	2,799.2207
Mobile											0.0000	5,557.9279	5,557.9279	0.2448	0.0000	5,564.0467
Waste											324.8992	0.0000	324.8992	19.2010	0.0000	804.9241
Water											142.8809	278.3467	421.2276	14.7130	0.3511	893.6801
Total											**467.7801**	**8,615.5063**	**9,083.2864**	**34.3865**	**0.3993**	**10,061.9250**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	0.0502	0.0502	1.3000e-004	0.0000	0.0535
Energy											0.0000	2,779.1816	2,779.1816	0.2276	0.0482	2,799.2207

Mobile											0.0000	5,557.9279	5,557.9279	0.2448	0.0000	5,564.0467
Waste											324.8992	0.0000	324.8992	19.2010	0.0000	804.9241
Water											142.8809	278.3467	421.2276	14.7130	0.3511	893.6801
Total											**467.7801**	**8,615.5063**	**9,083.2864**	**34.3865**	**0.3993**	**10,061.9250**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/5/2020	5/12/2020	5	70	
2	Site Preparation	Site Preparation	5/13/2020	7/7/2020	5	40	
3	Grading	Grading	7/8/2020	12/8/2020	5	110	
4	Building Construction	Building Construction	12/9/2020	3/11/2025	5	1110	
5	Paving	Paving	3/12/2025	6/24/2025	5	75	
6	Architectural Coating	Architectural Coating	6/25/2025	10/7/2025	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 275

Acres of Paving: 15.48

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 2,526,408; Non-Residential Outdoor: 842,136; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38

Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	978.00	402.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	196.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	118.9951	118.9951	0.0336	0.0000	119.8349
Total											**0.0000**	**118.9951**	**118.9951**	**0.0336**	**0.0000**	**119.8349**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.6900	3.6900	1.0000e-004	0.0000	3.6924
Total											**0.0000**	**3.6900**	**3.6900**	**1.0000e-004**	**0.0000**	**3.6924**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	118.9950	118.9950	0.0336	0.0000	119.8348
Total											**0.0000**	**118.9950**	**118.9950**	**0.0336**	**0.0000**	**119.8348**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.6900	3.6900	1.0000e-004	0.0000	3.6924
Total											**0.0000**	**3.6900**	**3.6900**	**1.0000e-004**	**0.0000**	**3.6924**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road											0.0000	66.8614	66.8614	0.0216	0.0000	67.4020
Total											**0.0000**	**66.8614**	**66.8614**	**0.0216**	**0.0000**	**67.4020**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	2.5303	2.5303	7.0000e-005	0.0000	2.5319
Total											**0.0000**	**2.5303**	**2.5303**	**7.0000e-005**	**0.0000**	**2.5319**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	66.8613	66.8613	0.0216	0.0000	67.4019
Total											**0.0000**	**66.8613**	**66.8613**	**0.0216**	**0.0000**	**67.4019**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	2.5303	2.5303	7.0000e-005	0.0000	2.5319
Total											**0.0000**	**2.5303**	**2.5303**	**7.0000e-005**	**0.0000**	**2.5319**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	299.6636	299.6636	0.0969	0.0000	302.0865
Total											**0.0000**	**299.6636**	**299.6636**	**0.0969**	**0.0000**	**302.0865**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	7.7314	7.7314	2.0000e-004	0.0000	7.7364
Total											**0.0000**	**7.7314**	**7.7314**	**2.0000e-004**	**0.0000**	**7.7364**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	299.6633	299.6633	0.0969	0.0000	302.0862
Total											**0.0000**	**299.6633**	**299.6633**	**0.0969**	**0.0000**	**302.0862**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Worker											0.0000	7.7314	7.7314	2.0000e-004	0.0000	7.7364
Total											**0.0000**	**7.7314**	**7.7314**	**2.0000e-004**	**0.0000**	**7.7364**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	19.6869	19.6869	4.8000e-003	0.0000	19.8069
Total											**0.0000**	**19.6869**	**19.6869**	**4.8000e-003**	**0.0000**	**19.8069**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	90.3832	90.3832	5.2000e-003	0.0000	90.5131
Worker											0.0000	58.4284	58.4284	1.5100e-003	0.0000	58.4661
Total											**0.0000**	**148.8116**	**148.8116**	**6.7100e-003**	**0.0000**	**148.9792**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	19.6868	19.6868	4.8000e-003	0.0000	19.8069
Total											**0.0000**	**19.6868**	**19.6868**	**4.8000e-003**	**0.0000**	**19.8069**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	90.3832	90.3832	5.2000e-003	0.0000	90.5131
Worker											0.0000	58.4284	58.4284	1.5100e-003	0.0000	58.4661
Total											**0.0000**	**148.8116**	**148.8116**	**6.7100e-003**	**0.0000**	**148.9792**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road											0.0000	302.2867	302.2867	0.0729	0.0000	304.1099
Total											**0.0000**	**302.2867**	**302.2867**	**0.0729**	**0.0000**	**304.1099**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	1,374.3240	1,374.3240	0.0755	0.0000	1,376.2112
Worker											0.0000	865.9280	865.9280	0.0207	0.0000	866.4452
Total											**0.0000**	**2,240.2520**	**2,240.2520**	**0.0962**	**0.0000**	**2,242.6564**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	302.2863	302.2863	0.0729	0.0000	304.1095
Total											**0.0000**	**302.2863**	**302.2863**	**0.0729**	**0.0000**	**304.1095**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	1,374.3240	1,374.3240	0.0755	0.0000	1,376.2112
Worker											0.0000	865.9280	865.9280	0.0207	0.0000	866.4452
Total											**0.0000**	**2,240.2520**	**2,240.2520**	**0.0962**	**0.0000**	**2,242.6564**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	301.2428	301.2428	0.0722	0.0000	303.0471
Total											**0.0000**	**301.2428**	**301.2428**	**0.0722**	**0.0000**	**303.0471**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	1,355.6713	1,355.6713	0.0719	0.0000	1,357.4680
Worker											0.0000	831.1735	831.1735	0.0185	0.0000	831.6348
Total											**0.0000**	**2,186.8448**	**2,186.8448**	**0.0903**	**0.0000**	**2,189.1028**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	301.2425	301.2425	0.0722	0.0000	303.0467
Total											**0.0000**	**301.2425**	**301.2425**	**0.0722**	**0.0000**	**303.0467**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	1,355.6713	1,355.6713	0.0719	0.0000	1,357.4680
Worker											0.0000	831.1735	831.1735	0.0185	0.0000	831.6348
Total											**0.0000**	**2,186.8448**	**2,186.8448**	**0.0903**	**0.0000**	**2,189.1028**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	301.3462	301.3462	0.0717	0.0000	303.1383
Total											**0.0000**	**301.3462**	**301.3462**	**0.0717**	**0.0000**	**303.1383**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	1,317.1031	1,317.1031	0.0574	0.0000	1,318.5378
Worker											0.0000	799.3849	799.3849	0.0165	0.0000	799.7975

Total											**0.0000**	**2,116.4880**	**2,116.4880**	**0.0739**	**0.0000**	**2,118.3354**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	301.3458	301.3458	0.0717	0.0000	303.1380
Total											**0.0000**	**301.3458**	**301.3458**	**0.0717**	**0.0000**	**303.1380**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	1,317.1031	1,317.1031	0.0574	0.0000	1,318.5378
Worker											0.0000	799.3849	799.3849	0.0165	0.0000	799.7975
Total											**0.0000**	**2,116.4880**	**2,116.4880**	**0.0739**	**0.0000**	**2,118.3354**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	303.7223	303.7223	0.0718	0.0000	305.5179
Total											**0.0000**	**303.7223**	**303.7223**	**0.0718**	**0.0000**	**305.5179**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	1,318.0427	1,318.0427	0.0571	0.0000	1,319.4706
Worker											0.0000	773.6061	773.6061	0.0150	0.0000	773.9799
Total											**0.0000**	**2,091.6488**	**2,091.6488**	**0.0721**	**0.0000**	**2,093.4505**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road											0.0000	303.7220	303.7220	0.0718	0.0000	305.5175
Total											**0.0000**	**303.7220**	**303.7220**	**0.0718**	**0.0000**	**305.5175**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	1,318.0427	1,318.0427	0.0571	0.0000	1,319.4706
Worker											0.0000	773.6061	773.6061	0.0150	0.0000	773.9799
Total											**0.0000**	**2,091.6488**	**2,091.6488**	**0.0721**	**0.0000**	**2,093.4505**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	57.9799	57.9799	0.0136	0.0000	58.3206
Total											**0.0000**	**57.9799**	**57.9799**	**0.0136**	**0.0000**	**58.3206**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	249.8842	249.8842	0.0107	0.0000	250.1528
Worker											0.0000	141.6074	141.6074	2.5800e-003	0.0000	141.6720
Total											**0.0000**	**391.4916**	**391.4916**	**0.0133**	**0.0000**	**391.8248**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	57.9798	57.9798	0.0136	0.0000	58.3205
Total											**0.0000**	**57.9798**	**57.9798**	**0.0136**	**0.0000**	**58.3205**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	249.8842	249.8842	0.0107	0.0000	250.1528
Worker											0.0000	141.6074	141.6074	2.5800e-003	0.0000	141.6720
Total											**0.0000**	**391.4916**	**391.4916**	**0.0133**	**0.0000**	**391.8248**

3.6 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	75.0722	75.0722	0.0243	0.0000	75.6792
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**75.0722**	**75.0722**	**0.0243**	**0.0000**	**75.6792**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2578	3.2578	6.0000e-005	0.0000	3.2593
Total											**0.0000**	**3.2578**	**3.2578**	**6.0000e-005**	**0.0000**	**3.2593**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	75.0721	75.0721	0.0243	0.0000	75.6791
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**75.0721**	**75.0721**	**0.0243**	**0.0000**	**75.6791**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2578	3.2578	6.0000e-005	0.0000	3.2593
Total											**0.0000**	**3.2578**	**3.2578**	**6.0000e-005**	**0.0000**	**3.2593**

3.7 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	9.5747	9.5747	5.2000e-004	0.0000	9.5878
Total											**0.0000**	**9.5747**	**9.5747**	**5.2000e-004**	**0.0000**	**9.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	42.5691	42.5691	7.8000e-004	0.0000	42.5885
Total											**0.0000**	**42.5691**	**42.5691**	**7.8000e-004**	**0.0000**	**42.5885**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	9.5747	9.5747	5.2000e-004	0.0000	9.5878
Total											**0.0000**	**9.5747**	**9.5747**	**5.2000e-004**	**0.0000**	**9.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	42.5691	42.5691	7.8000e-004	0.0000	42.5885
Total											**0.0000**	**42.5691**	**42.5691**	**7.8000e-004**	**0.0000**	**42.5885**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	5,557.9279	5,557.9279	0.2448	0.0000	5,564.0467
Unmitigated											0.0000	5,557.9279	5,557.9279	0.2448	0.0000	5,564.0467

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Enclosed Parking with Elevator	0.00	0.00	0.00		
General Heavy Industry	91.50	91.50	91.50	267,135	267,135
General Light Industry	90.61	17.16	8.84	199,799	199,799
General Office Building	2,106.73	469.86	200.55	3,824,991	3,824,991
Manufacturing	1,329.36	518.52	215.76	3,078,449	3,078,449
Parking Lot	0.00	0.00	0.00		
Refrigerated Warehouse-No Rail	426.72	426.72	426.72	1,245,814	1,245,814
Research & Development	1,784.20	418.00	244.20	3,431,124	3,431,124
Total	5,829.12	1,941.76	1,187.57	12,047,312	12,047,312

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Manufacturing	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Refrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH

Enclosed Parking with Elevator	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
General Heavy Industry	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
General Light Industry	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
General Office Building	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
Manufacturing	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
Parking Lot	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
Refrigerated Warehouse-No Rail	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
Research & Development	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	1,494.4591	1,494.4591	0.2030	0.0246	1,506.8638
Electricity Unmitigated											0.0000	1,494.4591	1,494.4591	0.2030	0.0246	1,506.8638
NaturalGas Mitigated											0.0000	1,284.7225	1,284.7225	0.0246	0.0236	1,292.3569
NaturalGas Unmitigated											0.0000	1,284.7225	1,284.7225	0.0246	0.0236	1,292.3569

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	1.50975e+006											0.0000	80.5660	80.5660	1.5400e-003	1.4800e-003	81.0448
General Light Industry	321750											0.0000	17.1698	17.1698	3.3000e-004	3.1000e-004	17.2718
General Office Building	3.69203e+006											0.0000	197.0208	197.0208	3.7800e-003	3.6100e-003	198.1916
Manufacturing	8.613e+006											0.0000	459.6225	459.6225	8.8100e-003	8.4300e-003	462.3538
Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4.49326e+006											0.0000	239.7775	239.7775	4.6000e-003	4.4000e-003	241.2023
Research & Development	5.445e+006											0.0000	290.5659	290.5659	5.5700e-003	5.3300e-003	292.2926
Total												**0.0000**	**1,284.7225**	**1,284.7225**	**0.0246**	**0.0236**	**1,292.3569**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	1.50975e+006											0.0000	80.5660	80.5660	1.5400e-003	1.4800e-003	81.0448
General Light Industry	321750											0.0000	17.1698	17.1698	3.3000e-004	3.1000e-004	17.2718
General Office Building	3.69203e+006											0.0000	197.0208	197.0208	3.7800e-003	3.6100e-003	198.1916
Manufacturing	8.613e+006											0.0000	459.6225	459.6225	8.8100e-003	8.4300e-003	462.3538

Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4.49326e+006											0.0000	239.7775	239.7775	4.6000e-003	4.4000e-003	241.2023
Research & Development	5.445e+006											0.0000	290.5659	290.5659	5.5700e-003	5.3300e-003	292.2926
Total												**0.0000**	**1,284.7225**	**1,284.7225**	**0.0246**	**0.0236**	**1,292.3569**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	461160	50.8304	6.9000e-003	8.4000e-004	51.2523
General Light Industry	98280	10.8327	1.4700e-003	1.8000e-004	10.9226
General Office Building	2.38368e+006	262.7362	0.0357	4.3200e-003	264.9171
Manufacturing	2.63088e+006	289.9833	0.0394	4.7700e-003	292.3903
Parking Lot	268492	29.5940	4.0200e-003	4.9000e-004	29.8396
Refrigerated Warehouse-No Rail	6.05282e+006	667.1597	0.0906	0.0110	672.6974
Research & Development	1.6632e+006	183.3228	0.0249	3.0200e-003	184.8445
Total		**1,494.4591**	**0.2030**	**0.0246**	**1,506.8638**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	461160	50.8304	6.9000e-003	8.4000e-004	51.2523
General Light Industry	98280	10.8327	1.4700e-003	1.8000e-004	10.9226
General Office Building	2.38368e+006	262.7362	0.0357	4.3200e-003	264.9171
Manufacturing	2.63088e+006	289.9833	0.0394	4.7700e-003	292.3903
Parking Lot	268492	29.5940	4.0200e-003	4.9000e-004	29.8396
Refrigerated Warehouse-No Rail	6.05282e+006	667.1597	0.0906	0.0110	672.6974
Research & Development	1.6632e+006	183.3228	0.0249	3.0200e-003	184.8445
Total		**1,494.4591**	**0.2030**	**0.0246**	**1,506.8638**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	0.0502	0.0502	1.3000e-004	0.0000	0.0535
Unmitigated											0.0000	0.0502	0.0502	1.3000e-004	0.0000	0.0535

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	0.0502	0.0502	1.3000e-004	0.0000	0.0535
Total											**0.0000**	**0.0502**	**0.0502**	**1.3000e-004**	**0.0000**	**0.0535**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	0.0502	0.0502	1.3000e-004	0.0000	0.0535
Total											**0.0000**	**0.0502**	**0.0502**	**1.3000e-004**	**0.0000**	**0.0535**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	421.2276	14.7130	0.3511	893.6801
Unmitigated	421.2276	14.7130	0.3511	893.6801

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	18.3358 / 0	16.7529	0.5990	0.0143	35.9846
General Light Industry	8.44063 / 0	7.7120	0.2757	6.5800e-003	16.5650
General Office Building	41.1934 / 25.2475	47.3771	1.3470	0.0323	90.6640
Manufacturing	175.782 / 0	160.6071	5.7421	0.1370	344.9779
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	68.2627 / 0	62.3696	2.2299	0.0532	133.9674
Research & Development	138.353 / 0	126.4089	4.5194	0.1078	271.5213

Total		**421.2276**	**14.7131**	**0.3511**	**893.6801**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	18.3358 / 0	16.7529	0.5990	0.0143	35.9846
General Light Industry	8.44063 / 0	7.7120	0.2757	6.5800e-003	16.5650
General Office Building	41.1934 / 25.2475	47.3771	1.3470	0.0323	90.6640
Manufacturing	175.782 / 0	160.6071	5.7421	0.1370	344.9779
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	68.2627 / 0	62.3696	2.2299	0.0532	133.9674
Research & Development	138.353 / 0	126.4089	4.5194	0.1078	271.5213
Total		**421.2276**	**14.7131**	**0.3511**	**893.6801**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	324.8992	19.2010	0.0000	804.9241
Unmitigated	324.8992	19.2010	0.0000	804.9241

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	98.32	19.9581	1.1795	0.0000	49.4453
General Light Industry	45.26	9.1874	0.5430	0.0000	22.7613
General Office Building	215.55	43.7547	2.5858	0.0000	108.4004
Manufacturing	942.57	191.3332	11.3075	0.0000	474.0199
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	277.48	56.3259	3.3288	0.0000	139.5451
Research & Development	21.38	4.3400	0.2565	0.0000	10.7520
Total		**324.8992**	**19.2010**	**0.0000**	**804.9240**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	98.32	19.9581	1.1795	0.0000	49.4453
General Light Industry	45.26	9.1874	0.5430	0.0000	22.7613
General Office Building	215.55	43.7547	2.5858	0.0000	108.4004
Manufacturing	942.57	191.3332	11.3075	0.0000	474.0199
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	277.48	56.3259	3.3288	0.0000	139.5451
Research & Development	21.38	4.3400	0.2565	0.0000	10.7520
Total		**324.8992**	**19.2010**	**0.0000**	**804.9240**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Bayer - Project - Y10

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	214.00	1000sqft	4.91	214,000.00	0
Research & Development	180.00	1000sqft	4.13	180,000.00	0
General Heavy Industry	71.00	1000sqft	1.63	71,000.00	0
General Light Industry	18.00	1000sqft	0.41	18,000.00	0
Manufacturing	548.00	1000sqft	12.58	548,000.00	0
Refrigerated Warehouse-No Rail	157.00	1000sqft	3.60	157,000.00	0
Enclosed Parking with Elevator	370.18	1000sqft	8.50	370,180.00	0
Parking Lot	165.02	1000sqft	3.79	165,020.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2025
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	194	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Energy intensity factors based on data for PG&E from The Climate Registry and RPS reductions

Land Use -

Construction Phase -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Grading -

Vehicle Trips -

Consumer Products -

Area Coating -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	194
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.5430	5.5695	3.8189	0.0105	0.9049	0.2097	1.1146	0.3677	0.1945	0.5622	0.0000	947.1592	947.1592	0.1524	0.0000	950.9689
2021	0.6470	6.4144	5.1243	0.0203	0.9475	0.1381	1.0855	0.2577	0.1298	0.3875	0.0000	1,871.9831	1,871.9831	0.1404	0.0000	1,875.4918
2022	0.5915	5.9356	4.8455	0.0199	0.9438	0.1169	1.0607	0.2567	0.1100	0.3666	0.0000	1,833.5477	1,833.5477	0.1355	0.0000	1,836.9349
2023	6.6345	2.9139	2.9415	0.0112	0.5304	0.0681	0.5985	0.1440	0.0639	0.2079	0.0000	1,028.5990	1,028.5990	0.0838	0.0000	1,030.6950
Maximum	**6.6345**	**6.4144**	**5.1243**	**0.0203**	**0.9475**	**0.2097**	**1.1146**	**0.3677**	**0.1945**	**0.5622**	**0.0000**	**1,871.9831**	**1,871.9831**	**0.1524**	**0.0000**	**1,875.4918**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.5430	5.5695	3.8189	0.0105	0.9049	0.2097	1.1146	0.3677	0.1945	0.5622	0.0000	947.1587	947.1587	0.1524	0.0000	950.9684
2021	0.6470	6.4144	5.1243	0.0203	0.9475	0.1381	1.0855	0.2577	0.1298	0.3875	0.0000	1,871.9827	1,871.9827	0.1404	0.0000	1,875.4914
2022	0.5915	5.9356	4.8455	0.0199	0.9438	0.1169	1.0607	0.2567	0.1100	0.3666	0.0000	1,833.5473	1,833.5473	0.1355	0.0000	1,836.9345
2023	6.6345	2.9139	2.9415	0.0112	0.5304	0.0681	0.5985	0.1440	0.0639	0.2079	0.0000	1,028.5987	1,028.5987	0.0838	0.0000	1,030.6948
Maximum	**6.6345**	**6.4144**	**5.1243**	**0.0203**	**0.9475**	**0.2097**	**1.1146**	**0.3677**	**0.1945**	**0.5622**	**0.0000**	**1,871.9827**	**1,871.9827**	**0.1524**	**0.0000**	**1,875.4914**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	2-5-2020	5-4-2020	1.2481	1.2481
2	5-5-2020	8-4-2020	1.7353	1.7353
3	8-5-2020	11-4-2020	1.8996	1.8996
4	11-5-2020	2-4-2021	1.9022	1.9022
5	2-5-2021	5-4-2021	1.7220	1.7220
6	5-5-2021	8-4-2021	1.7657	1.7657
7	8-5-2021	11-4-2021	1.7745	1.7745
8	11-5-2021	2-4-2022	1.7396	1.7396
9	2-5-2022	5-4-2022	1.5978	1.5978
10	5-5-2022	8-4-2022	1.6390	1.6390
11	8-5-2022	11-4-2022	1.6468	1.6468

12	**11-5-2022**	**2-4-2023**	1.5550	1.5550
13	**2-5-2023**	**5-4-2023**	1.3338	1.3338
14	**5-5-2023**	**8-4-2023**	1.1101	1.1101
15	**8-5-2023**	**9-30-2023**	0.5478	0.5478
		Highest	1.9022	1.9022

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.3064	1.4000e-004	0.0158	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0308	0.0308	8.0000e-005	0.0000	0.0328
Energy	0.1463	1.3301	1.1173	7.9800e-003		0.1011	0.1011		0.1011	0.1011	0.0000	2,751.7347	2,751.7347	0.2495	0.0534	2,773.8942
Mobile	1.1444	7.5713	13.0944	0.0583	4.9728	0.0467	5.0194	1.3363	0.0437	1.3800	0.0000	5,390.9666	5,390.9666	0.1967	0.0000	5,395.8849
Waste						0.0000	0.0000		0.0000	0.0000	233.4721	0.0000	233.4721	13.7978	0.0000	578.4172
Water						0.0000	0.0000		0.0000	0.0000	98.3971	154.8593	253.2563	10.1327	0.2418	578.6368
Total	**6.5971**	**8.9016**	**14.2275**	**0.0663**	**4.9728**	**0.1478**	**5.1206**	**1.3363**	**0.1448**	**1.4811**	**331.8692**	**8,297.5914**	**8,629.4606**	**24.3768**	**0.2953**	**9,326.8660**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.3064	1.4000e-004	0.0158	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0308	0.0308	8.0000e-005	0.0000	0.0328

Energy	0.1463	1.3301	1.1173	7.9800e-003		0.1011	0.1011		0.1011	0.1011	0.0000	2,751.7347	2,751.7347	0.2495	0.0534	2,773.8942
Mobile	1.1444	7.5713	13.0944	0.0583	4.9728	0.0467	5.0194	1.3363	0.0437	1.3800	0.0000	5,390.9666	5,390.9666	0.1967	0.0000	5,395.8849
Waste						0.0000	0.0000		0.0000	0.0000	233.4721	0.0000	233.4721	13.7978	0.0000	578.4172
Water						0.0000	0.0000		0.0000	0.0000	98.3971	154.8593	253.2563	10.1327	0.2418	578.6368
Total	**6.5971**	**8.9016**	**14.2275**	**0.0663**	**4.9728**	**0.1478**	**5.1206**	**1.3363**	**0.1448**	**1.4811**	**331.8692**	**8,297.5914**	**8,629.4606**	**24.3768**	**0.2953**	**9,326.8660**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	2/5/2020	4/14/2020	5	50	
2	Site Preparation	Site Preparation	4/15/2020	5/26/2020	5	30	
3	Grading	Grading	5/27/2020	9/8/2020	5	75	
4	Building Construction	Building Construction	9/9/2020	7/11/2023	5	740	
5	Paving	Paving	7/12/2023	9/26/2023	5	55	
6	Architectural Coating	Architectural Coating	9/27/2023	12/12/2023	5	55	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 187.5

Acres of Paving: 12.29

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,782,000; Non-Residential Outdoor: 594,000; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73

Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	684.00	282.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	137.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0828	0.8300	0.5438	9.7000e-004		0.0415	0.0415		0.0386	0.0386	0.0000	84.9965	84.9965	0.0240	0.0000	85.5964
Total	**0.0828**	**0.8300**	**0.5438**	**9.7000e-004**		**0.0415**	**0.0415**		**0.0386**	**0.0386**	**0.0000**	**84.9965**	**84.9965**	**0.0240**	**0.0000**	**85.5964**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-003	9.6000e-004	9.8100e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.6357	2.6357	7.0000e-005	0.0000	2.6374
Total	**1.3000e-003**	**9.6000e-004**	**9.8100e-003**	**3.0000e-005**	**2.9700e-003**	**2.0000e-005**	**2.9900e-003**	**7.9000e-004**	**2.0000e-005**	**8.1000e-004**	**0.0000**	**2.6357**	**2.6357**	**7.0000e-005**	**0.0000**	**2.6374**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0828	0.8300	0.5438	9.7000e-004		0.0415	0.0415		0.0386	0.0386	0.0000	84.9964	84.9964	0.0240	0.0000	85.5963
Total	**0.0828**	**0.8300**	**0.5438**	**9.7000e-004**		**0.0415**	**0.0415**		**0.0386**	**0.0386**	**0.0000**	**84.9964**	**84.9964**	**0.0240**	**0.0000**	**85.5963**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-003	9.6000e-004	9.8100e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.6357	2.6357	7.0000e-005	0.0000	2.6374
Total	**1.3000e-003**	**9.6000e-004**	**9.8100e-003**	**3.0000e-005**	**2.9700e-003**	**2.0000e-005**	**2.9900e-003**	**7.9000e-004**	**2.0000e-005**	**8.1000e-004**	**0.0000**	**2.6357**	**2.6357**	**7.0000e-005**	**0.0000**	**2.6374**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					0.2710	0.0000	0.2710	0.1490	0.0000	0.1490	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0612	0.6363	0.3227	5.7000e-004		0.0330	0.0330		0.0303	0.0303	0.0000	50.1460	50.1460	0.0162	0.0000	50.5515
Total	**0.0612**	**0.6363**	**0.3227**	**5.7000e-004**	**0.2710**	**0.0330**	**0.3040**	**0.1490**	**0.0303**	**0.1793**	**0.0000**	**50.1460**	**50.1460**	**0.0162**	**0.0000**	**50.5515**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.3000e-004	6.9000e-004	7.0600e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1500e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.8977	1.8977	5.0000e-005	0.0000	1.8989
Total	**9.3000e-004**	**6.9000e-004**	**7.0600e-003**	**2.0000e-005**	**2.1300e-003**	**1.0000e-005**	**2.1500e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.8977**	**1.8977**	**5.0000e-005**	**0.0000**	**1.8989**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2710	0.0000	0.2710	0.1490	0.0000	0.1490	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0612	0.6363	0.3227	5.7000e-004		0.0330	0.0330		0.0303	0.0303	0.0000	50.1460	50.1460	0.0162	0.0000	50.5514
Total	**0.0612**	**0.6363**	**0.3227**	**5.7000e-004**	**0.2710**	**0.0330**	**0.3040**	**0.1490**	**0.0303**	**0.1793**	**0.0000**	**50.1460**	**50.1460**	**0.0162**	**0.0000**	**50.5514**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.3000e-004	6.9000e-004	7.0600e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1500e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.8977	1.8977	5.0000e-005	0.0000	1.8989
Total	**9.3000e-004**	**6.9000e-004**	**7.0600e-003**	**2.0000e-005**	**2.1300e-003**	**1.0000e-005**	**2.1500e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.8977**	**1.8977**	**5.0000e-005**	**0.0000**	**1.8989**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3253	0.0000	0.3253	0.1349	0.0000	0.1349	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1669	1.8824	1.1984	2.3300e-003		0.0815	0.0815		0.0750	0.0750	0.0000	204.3161	204.3161	0.0661	0.0000	205.9681
Total	**0.1669**	**1.8824**	**1.1984**	**2.3300e-003**	**0.3253**	**0.0815**	**0.4068**	**0.1349**	**0.0750**	**0.2099**	**0.0000**	**204.3161**	**204.3161**	**0.0661**	**0.0000**	**205.9681**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5900e-003	1.9100e-003	0.0196	6.0000e-005	5.9300e-003	4.0000e-005	5.9700e-003	1.5800e-003	4.0000e-005	1.6200e-003	0.0000	5.2714	5.2714	1.4000e-004	0.0000	5.2748
Total	**2.5900e-003**	**1.9100e-003**	**0.0196**	**6.0000e-005**	**5.9300e-003**	**4.0000e-005**	**5.9700e-003**	**1.5800e-003**	**4.0000e-005**	**1.6200e-003**	**0.0000**	**5.2714**	**5.2714**	**1.4000e-004**	**0.0000**	**5.2748**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3253	0.0000	0.3253	0.1349	0.0000	0.1349	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1669	1.8824	1.1984	2.3300e-003		0.0815	0.0815		0.0750	0.0750	0.0000	204.3159	204.3159	0.0661	0.0000	205.9679
Total	**0.1669**	**1.8824**	**1.1984**	**2.3300e-003**	**0.3253**	**0.0815**	**0.4068**	**0.1349**	**0.0750**	**0.2099**	**0.0000**	**204.3159**	**204.3159**	**0.0661**	**0.0000**	**205.9679**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5900e-003	1.9100e-003	0.0196	6.0000e-005	5.9300e-003	4.0000e-005	5.9700e-003	1.5800e-003	4.0000e-005	1.6200e-003	0.0000	5.2714	5.2714	1.4000e-004	0.0000	5.2748
Total	**2.5900e-003**	**1.9100e-003**	**0.0196**	**6.0000e-005**	**5.9300e-003**	**4.0000e-005**	**5.9700e-003**	**1.5800e-003**	**4.0000e-005**	**1.6200e-003**	**0.0000**	**5.2714**	**5.2714**	**1.4000e-004**	**0.0000**	**5.2748**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0869	0.7866	0.6908	1.1000e-003		0.0458	0.0458		0.0431	0.0431	0.0000	94.9601	94.9601	0.0232	0.0000	95.5393
Total	**0.0869**	**0.7866**	**0.6908**	**1.1000e-003**		**0.0458**	**0.0458**		**0.0431**	**0.0431**	**0.0000**	**94.9601**	**94.9601**	**0.0232**	**0.0000**	**95.5393**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0434	1.3591	0.2929	3.1900e-003	0.0759	6.3000e-003	0.0822	0.0220	6.0300e-003	0.0280	0.0000	305.8269	305.8269	0.0176	0.0000	306.2665
Worker	0.0970	0.0716	0.7338	2.1800e-003	0.2217	1.5400e-003	0.2233	0.0590	1.4200e-003	0.0604	0.0000	197.1088	197.1088	5.0900e-003	0.0000	197.2360
Total	**0.1404**	**1.4306**	**1.0266**	**5.3700e-003**	**0.2977**	**7.8400e-003**	**0.3055**	**0.0810**	**7.4500e-003**	**0.0884**	**0.0000**	**502.9356**	**502.9356**	**0.0227**	**0.0000**	**503.5025**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0869	0.7866	0.6908	1.1000e-003		0.0458	0.0458		0.0431	0.0431	0.0000	94.9600	94.9600	0.0232	0.0000	95.5392
Total	**0.0869**	**0.7866**	**0.6908**	**1.1000e-003**		**0.0458**	**0.0458**		**0.0431**	**0.0431**	**0.0000**	**94.9600**	**94.9600**	**0.0232**	**0.0000**	**95.5392**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0434	1.3591	0.2929	3.1900e-003	0.0759	6.3000e-003	0.0822	0.0220	6.0300e-003	0.0280	0.0000	305.8269	305.8269	0.0176	0.0000	306.2665
Worker	0.0970	0.0716	0.7338	2.1800e-003	0.2217	1.5400e-003	0.2233	0.0590	1.4200e-003	0.0604	0.0000	197.1088	197.1088	5.0900e-003	0.0000	197.2360
Total	**0.1404**	**1.4306**	**1.0266**	**5.3700e-003**	**0.2977**	**7.8400e-003**	**0.3055**	**0.0810**	**7.4500e-003**	**0.0884**	**0.0000**	**502.9356**	**502.9356**	**0.0227**	**0.0000**	**503.5025**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2867	302.2867	0.0729	0.0000	304.1099
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**	**0.0000**	**302.2867**	**302.2867**	**0.0729**	**0.0000**	**304.1099**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1139	3.9364	0.8338	0.0101	0.2417	8.2100e-003	0.2499	0.0699	7.8500e-003	0.0778	0.0000	964.0781	964.0781	0.0530	0.0000	965.4019
Worker	0.2851	0.2031	2.1275	6.7000e-003	0.7058	4.7400e-003	0.7105	0.1878	4.3700e-003	0.1921	0.0000	605.6184	605.6184	0.0145	0.0000	605.9801
Total	**0.3990**	**4.1395**	**2.9613**	**0.0168**	**0.9475**	**0.0130**	**0.9604**	**0.2577**	**0.0122**	**0.2699**	**0.0000**	**1,569.6964**	**1,569.6964**	**0.0674**	**0.0000**	**1,571.3819**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2863	302.2863	0.0729	0.0000	304.1095

Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**	**0.0000**	**302.2863**	**302.2863**	**0.0729**	**0.0000**	**304.1095**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1139	3.9364	0.8338	0.0101	0.2417	8.2100e-003	0.2499	0.0699	7.8500e-003	0.0778	0.0000	964.0781	964.0781	0.0530	0.0000	965.4019
Worker	0.2851	0.2031	2.1275	6.7000e-003	0.7058	4.7400e-003	0.7105	0.1878	4.3700e-003	0.1921	0.0000	605.6184	605.6184	0.0145	0.0000	605.9801
Total	**0.3990**	**4.1395**	**2.9613**	**0.0168**	**0.9475**	**0.0130**	**0.9604**	**0.2577**	**0.0122**	**0.2699**	**0.0000**	**1,569.6964**	**1,569.6964**	**0.0674**	**0.0000**	**1,571.3819**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2428	301.2428	0.0722	0.0000	303.0471
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2428**	**301.2428**	**0.0722**	**0.0000**	**303.0471**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1061	3.7244	0.7780	9.9300e-003	0.2408	7.0700e-003	0.2479	0.0697	6.7700e-003	0.0764	0.0000	950.9933	950.9933	0.0504	0.0000	952.2537
Worker	0.2637	0.1812	1.9402	6.4300e-003	0.7031	4.6000e-003	0.7077	0.1870	4.2400e-003	0.1913	0.0000	581.3115	581.3115	0.0129	0.0000	581.6342
Total	**0.3697**	**3.9056**	**2.7182**	**0.0164**	**0.9438**	**0.0117**	**0.9555**	**0.2567**	**0.0110**	**0.2677**	**0.0000**	**1,532.3049**	**1,532.3049**	**0.0633**	**0.0000**	**1,533.8878**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2425	301.2425	0.0722	0.0000	303.0467
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2425**	**301.2425**	**0.0722**	**0.0000**	**303.0467**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1061	3.7244	0.7780	9.9300e-003	0.2408	7.0700e-003	0.2479	0.0697	6.7700e-003	0.0764	0.0000	950.9933	950.9933	0.0504	0.0000	952.2537
Worker	0.2637	0.1812	1.9402	6.4300e-003	0.7031	4.6000e-003	0.7077	0.1870	4.2400e-003	0.1913	0.0000	581.3115	581.3115	0.0129	0.0000	581.6342
Total	**0.3697**	**3.9056**	**2.7182**	**0.0164**	**0.9438**	**0.0117**	**0.9555**	**0.2567**	**0.0110**	**0.2677**	**0.0000**	**1,532.3049**	**1,532.3049**	**0.0633**	**0.0000**	**1,533.8878**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1077	0.9854	1.1127	1.8500e-003		0.0479	0.0479		0.0451	0.0451	0.0000	158.7863	158.7863	0.0378	0.0000	159.7306
Total	**0.1077**	**0.9854**	**1.1127**	**1.8500e-003**		**0.0479**	**0.0479**		**0.0451**	**0.0451**	**0.0000**	**158.7863**	**158.7863**	**0.0378**	**0.0000**	**159.7306**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0410	1.5192	0.3583	5.0800e-003	0.1269	1.6100e-003	0.1285	0.0367	1.5400e-003	0.0382	0.0000	486.8443	486.8443	0.0212	0.0000	487.3746

Worker	0.1293	0.0856	0.9361	3.2600e-003	0.3705	2.3700e-003	0.3728	0.0986	2.1800e-003	0.1007	0.0000	294.5916	294.5916	6.0800e-003	0.0000	294.7437
Total	**0.1703**	**1.6048**	**1.2944**	**8.3400e-003**	**0.4973**	**3.9800e-003**	**0.5013**	**0.1353**	**3.7200e-003**	**0.1390**	**0.0000**	**781.4359**	**781.4359**	**0.0273**	**0.0000**	**782.1183**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1077	0.9854	1.1127	1.8500e-003		0.0479	0.0479		0.0451	0.0451	0.0000	158.7861	158.7861	0.0378	0.0000	159.7304
Total	**0.1077**	**0.9854**	**1.1127**	**1.8500e-003**		**0.0479**	**0.0479**		**0.0451**	**0.0451**	**0.0000**	**158.7861**	**158.7861**	**0.0378**	**0.0000**	**159.7304**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0410	1.5192	0.3583	5.0800e-003	0.1269	1.6100e-003	0.1285	0.0367	1.5400e-003	0.0382	0.0000	486.8443	486.8443	0.0212	0.0000	487.3746
Worker	0.1293	0.0856	0.9361	3.2600e-003	0.3705	2.3700e-003	0.3728	0.0986	2.1800e-003	0.1007	0.0000	294.5916	294.5916	6.0800e-003	0.0000	294.7437
Total	**0.1703**	**1.6048**	**1.2944**	**8.3400e-003**	**0.4973**	**3.9800e-003**	**0.5013**	**0.1353**	**3.7200e-003**	**0.1390**	**0.0000**	**781.4359**	**781.4359**	**0.0273**	**0.0000**	**782.1183**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0284	0.2803	0.4011	6.3000e-004		0.0140	0.0140		0.0129	0.0129	0.0000	55.0739	55.0739	0.0178	0.0000	55.5192
Paving	4.9600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0334**	**0.2803**	**0.4011**	**6.3000e-004**		**0.0140**	**0.0140**		**0.0129**	**0.0129**	**0.0000**	**55.0739**	**55.0739**	**0.0178**	**0.0000**	**55.5192**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	7.5000e-004	8.2400e-003	3.0000e-005	3.2600e-003	2.0000e-005	3.2800e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.5936	2.5936	5.0000e-005	0.0000	2.5949
Total	**1.1400e-003**	**7.5000e-004**	**8.2400e-003**	**3.0000e-005**	**3.2600e-003**	**2.0000e-005**	**3.2800e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**2.5936**	**2.5936**	**5.0000e-005**	**0.0000**	**2.5949**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.0284	0.2803	0.4011	6.3000e-004		0.0140	0.0140		0.0129	0.0129	0.0000	55.0738	55.0738	0.0178	0.0000	55.5191
Paving	4.9600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0334**	**0.2803**	**0.4011**	**6.3000e-004**		**0.0140**	**0.0140**		**0.0129**	**0.0129**	**0.0000**	**55.0738**	**55.0738**	**0.0178**	**0.0000**	**55.5191**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1400e-003	7.5000e-004	8.2400e-003	3.0000e-005	3.2600e-003	2.0000e-005	3.2800e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.5936	2.5936	5.0000e-005	0.0000	2.5949
Total	**1.1400e-003**	**7.5000e-004**	**8.2400e-003**	**3.0000e-005**	**3.2600e-003**	**2.0000e-005**	**3.2800e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**2.5936**	**2.5936**	**5.0000e-005**	**0.0000**	**2.5949**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.3063					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2700e-003	0.0358	0.0498	8.0000e-005		1.9500e-003	1.9500e-003		1.9500e-003	1.9500e-003	0.0000	7.0215	7.0215	4.2000e-004	0.0000	7.0320

Total	**6.3116**	**0.0358**	**0.0498**	**8.0000e-005**		**1.9500e-003**	**1.9500e-003**		**1.9500e-003**	**1.9500e-003**	**0.0000**	**7.0215**	**7.0215**	**4.2000e-004**	**0.0000**	**7.0320**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0104	6.8900e-003	0.0753	2.6000e-004	0.0298	1.9000e-004	0.0300	7.9200e-003	1.8000e-004	8.1000e-003	0.0000	23.6879	23.6879	4.9000e-004	0.0000	23.7002
Total	**0.0104**	**6.8900e-003**	**0.0753**	**2.6000e-004**	**0.0298**	**1.9000e-004**	**0.0300**	**7.9200e-003**	**1.8000e-004**	**8.1000e-003**	**0.0000**	**23.6879**	**23.6879**	**4.9000e-004**	**0.0000**	**23.7002**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.3063					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2700e-003	0.0358	0.0498	8.0000e-005		1.9500e-003	1.9500e-003		1.9500e-003	1.9500e-003	0.0000	7.0214	7.0214	4.2000e-004	0.0000	7.0319
Total	**6.3116**	**0.0358**	**0.0498**	**8.0000e-005**		**1.9500e-003**	**1.9500e-003**		**1.9500e-003**	**1.9500e-003**	**0.0000**	**7.0214**	**7.0214**	**4.2000e-004**	**0.0000**	**7.0319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0104	6.8900e-003	0.0753	2.6000e-004	0.0298	1.9000e-004	0.0300	7.9200e-003	1.8000e-004	8.1000e-003	0.0000	23.6879	23.6879	4.9000e-004	0.0000	23.7002
Total	**0.0104**	**6.8900e-003**	**0.0753**	**2.6000e-004**	**0.0298**	**1.9000e-004**	**0.0300**	**7.9200e-003**	**1.8000e-004**	**8.1000e-003**	**0.0000**	**23.6879**	**23.6879**	**4.9000e-004**	**0.0000**	**23.7002**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.1444	7.5713	13.0944	0.0583	4.9728	0.0467	5.0194	1.3363	0.0437	1.3800	0.0000	5,390.9666	5,390.9666	0.1967	0.0000	5,395.8849
Unmitigated	1.1444	7.5713	13.0944	0.0583	4.9728	0.0467	5.0194	1.3363	0.0437	1.3800	0.0000	5,390.9666	5,390.9666	0.1967	0.0000	5,395.8849

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT

Enclosed Parking with Elevator	0.00	0.00	0.00		
General Heavy Industry	106.50	106.50	106.50	310,928	310,928
General Light Industry	125.46	23.76	12.24	276,645	276,645
General Office Building	2,360.42	526.44	224.70	4,285,592	4,285,592
Manufacturing	2,093.36	816.52	339.76	4,847,673	4,847,673
Parking Lot	0.00	0.00	0.00		
Refrigerated Warehouse-No Rail	263.76	263.76	263.76	770,050	770,050
Research & Development	1,459.80	342.00	199.80	2,807,283	2,807,283
Total	6,409.30	2,078.98	1,146.76	13,298,171	13,298,171

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Manufacturing	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Refrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.563555	0.037576	0.190339	0.105468	0.014285	0.005132	0.025195	0.047484	0.002230	0.002277	0.005427	0.000351	0.000679
General Heavy Industry	0.563555	0.037576	0.190339	0.105468	0.014285	0.005132	0.025195	0.047484	0.002230	0.002277	0.005427	0.000351	0.000679
General Light Industry	0.563555	0.037576	0.190339	0.105468	0.014285	0.005132	0.025195	0.047484	0.002230	0.002277	0.005427	0.000351	0.000679
General Office Building	0.563555	0.037576	0.190339	0.105468	0.014285	0.005132	0.025195	0.047484	0.002230	0.002277	0.005427	0.000351	0.000679
Manufacturing	0.563555	0.037576	0.190339	0.105468	0.014285	0.005132	0.025195	0.047484	0.002230	0.002277	0.005427	0.000351	0.000679
Parking Lot	0.563555	0.037576	0.190339	0.105468	0.014285	0.005132	0.025195	0.047484	0.002230	0.002277	0.005427	0.000351	0.000679
Refrigerated Warehouse-No Rail	0.563555	0.037576	0.190339	0.105468	0.014285	0.005132	0.025195	0.047484	0.002230	0.002277	0.005427	0.000351	0.000679
Research & Development	0.563555	0.037576	0.190339	0.105468	0.014285	0.005132	0.025195	0.047484	0.002230	0.002277	0.005427	0.000351	0.000679

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,303.7238	1,303.7238	0.2218	0.0269	1,317.2785
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,303.7238	1,303.7238	0.2218	0.0269	1,317.2785
NaturalGas Mitigated	0.1463	1.3301	1.1173	7.9800e-003		0.1011	0.1011		0.1011	0.1011	0.0000	1,448.0109	1,448.0109	0.0278	0.0266	1,456.6157
NaturalGas Unmitigated	0.1463	1.3301	1.1173	7.9800e-003		0.1011	0.1011		0.1011	0.1011	0.0000	1,448.0109	1,448.0109	0.0278	0.0266	1,456.6157

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	1.75725e+006	9.4800e-003	0.0861	0.0724	5.2000e-004		6.5500e-003	6.5500e-003		6.5500e-003	6.5500e-003	0.0000	93.7736	93.7736	1.8000e-003	1.7200e-003	94.3308
General Light Industry	445500	2.4000e-003	0.0218	0.0183	1.3000e-004		1.6600e-003	1.6600e-003		1.6600e-003	1.6600e-003	0.0000	23.7736	23.7736	4.6000e-004	4.4000e-004	23.9149
General Office Building	4.13662e+006	0.0223	0.2028	0.1703	1.2200e-003		0.0154	0.0154		0.0154	0.0154	0.0000	220.7458	220.7458	4.2300e-003	4.0500e-003	222.0576
Manufacturing	1.3563e+007	0.0731	0.6649	0.5585	3.9900e-003		0.0505	0.0505		0.0505	0.0505	0.0000	723.7733	723.7733	0.0139	0.0133	728.0744
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Refrigerated Warehouse-No Rail	2.77733e+006	0.0150	0.1361	0.1144	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	148.2089	148.2089	2.8400e-003	2.7200e-003	149.0896
Research & Development	4.455e+006	0.0240	0.2184	0.1834	1.3100e-003		0.0166	0.0166		0.0166	0.0166	0.0000	237.7358	237.7358	4.5600e-003	4.3600e-003	239.1485
Total		**0.1463**	**1.3301**	**1.1173**	**7.9900e-003**		**0.1011**	**0.1011**		**0.1011**	**0.1011**	**0.0000**	**1,448.0109**	**1,448.0109**	**0.0278**	**0.0266**	**1,456.6157**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	1.75725e+006	9.4800e-003	0.0861	0.0724	5.2000e-004		6.5500e-003	6.5500e-003		6.5500e-003	6.5500e-003	0.0000	93.7736	93.7736	1.8000e-003	1.7200e-003	94.3308
General Light Industry	445500	2.4000e-003	0.0218	0.0183	1.3000e-004		1.6600e-003	1.6600e-003		1.6600e-003	1.6600e-003	0.0000	23.7736	23.7736	4.6000e-004	4.4000e-004	23.9149
General Office Building	4.13662e+006	0.0223	0.2028	0.1703	1.2200e-003		0.0154	0.0154		0.0154	0.0154	0.0000	220.7458	220.7458	4.2300e-003	4.0500e-003	222.0576
Manufacturing	1.3563e+007	0.0731	0.6649	0.5585	3.9900e-003		0.0505	0.0505		0.0505	0.0505	0.0000	723.7733	723.7733	0.0139	0.0133	728.0744
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	2.77733e+006	0.0150	0.1361	0.1144	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	148.2089	148.2089	2.8400e-003	2.7200e-003	149.0896
Research & Development	4.455e+006	0.0240	0.2184	0.1834	1.3100e-003		0.0166	0.0166		0.0166	0.0166	0.0000	237.7358	237.7358	4.5600e-003	4.3600e-003	239.1485
Total		**0.1463**	**1.3301**	**1.1173**	**7.9900e-003**		**0.1011**	**0.1011**		**0.1011**	**0.1011**	**0.0000**	**1,448.0109**	**1,448.0109**	**0.0278**	**0.0266**	**1,456.6157**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e

Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	2.16925e+006	190.8877	0.0325	3.9400e-003	192.8724
General Heavy Industry	536760	47.2332	8.0300e-003	9.7000e-004	47.7243
General Light Industry	136080	11.9746	2.0400e-003	2.5000e-004	12.0991
General Office Building	2.67072e+006	235.0151	0.0400	4.8500e-003	237.4586
Manufacturing	4.14288e+006	364.5607	0.0620	7.5200e-003	368.3510
Parking Lot	57757	5.0824	8.6000e-004	1.0000e-004	5.1353
Refrigerated Warehouse-No Rail	3.74131e+006	329.2238	0.0560	6.7900e-003	332.6467
Research & Development	1.3608e+006	119.7462	0.0204	2.4700e-003	120.9912
Total		**1,303.7238**	**0.2218**	**0.0269**	**1,317.2785**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	2.16925e+006	190.8877	0.0325	3.9400e-003	192.8724
General Heavy Industry	536760	47.2332	8.0300e-003	9.7000e-004	47.7243
General Light Industry	136080	11.9746	2.0400e-003	2.5000e-004	12.0991
General Office Building	2.67072e+006	235.0151	0.0400	4.8500e-003	237.4586
Manufacturing	4.14288e+006	364.5607	0.0620	7.5200e-003	368.3510
Parking Lot	57757	5.0824	8.6000e-004	1.0000e-004	5.1353

Refrigerated Warehouse-No Rail	3.74131e+006	329.2238	0.0560	6.7900e-003	332.6467
Research & Development	1.3608e+006	119.7462	0.0204	2.4700e-003	120.9912
Total		**1,303.7238**	**0.2218**	**0.0269**	**1,317.2785**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.3064	1.4000e-004	0.0158	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0308	0.0308	8.0000e-005	0.0000	0.0328
Unmitigated	5.3064	1.4000e-004	0.0158	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0308	0.0308	8.0000e-005	0.0000	0.0328

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6306					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.6743					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Landscaping	1.4500e-003	1.4000e-004	0.0158	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0308	0.0308	8.0000e-005	0.0000	0.0328
Total	**5.3064**	**1.4000e-004**	**0.0158**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0308**	**0.0308**	**8.0000e-005**	**0.0000**	**0.0328**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6306					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.6743					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.4500e-003	1.4000e-004	0.0158	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0308	0.0308	8.0000e-005	0.0000	0.0328
Total	**5.3064**	**1.4000e-004**	**0.0158**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0308**	**0.0308**	**8.0000e-005**	**0.0000**	**0.0328**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	253.2563	10.1327	0.2418	578.6368
Unmitigated	253.2563	10.1327	0.2418	578.6368

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	16.4187 / 0	13.0267	0.5363	0.0128	30.2477
General Light Industry	4.1625 / 0	3.3026	0.1360	3.2400e-003	7.6684
General Office Building	38.035 / 23.3118	37.3570	1.2437	0.0298	77.3249
Manufacturing	126.725 / 0	100.5443	4.1396	0.0988	233.4608
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	36.3062 / 0	28.8056	1.1860	0.0283	66.8857
Research & Development	88.5049 / 0	70.2203	2.8911	0.0690	163.0493
Total		**253.2563**	**10.1327**	**0.2418**	**578.6368**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	16.4187 / 0	13.0267	0.5363	0.0128	30.2477

General Light Industry	4.1625 / 0	3.3026	0.1360	3.2400e-003	7.6684
General Office Building	38.035 / 23.3118	37.3570	1.2437	0.0298	77.3249
Manufacturing	126.725 / 0	100.5443	4.1396	0.0988	233.4608
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	36.3062 / 0	28.8056	1.1860	0.0283	66.8857
Research & Development	88.5049 / 0	70.2203	2.8911	0.0690	163.0493
Total		**253.2563**	**10.1327**	**0.2418**	**578.6368**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	233.4721	13.7978	0.0000	578.4172
Unmitigated	233.4721	13.7978	0.0000	578.4172

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	88.04	17.8713	1.0562	0.0000	44.2755
General Light Industry	22.32	4.5308	0.2678	0.0000	11.2248
General Office Building	199.02	40.3993	2.3875	0.0000	100.0875
Manufacturing	679.52	137.9364	8.1518	0.0000	341.7316
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	147.58	29.9574	1.7704	0.0000	74.2182
Research & Development	13.68	2.7769	0.1641	0.0000	6.8797
Total		**233.4721**	**13.7978**	**0.0000**	**578.4172**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	88.04	17.8713	1.0562	0.0000	44.2755
General Light Industry	22.32	4.5308	0.2678	0.0000	11.2248
General Office Building	199.02	40.3993	2.3875	0.0000	100.0875
Manufacturing	679.52	137.9364	8.1518	0.0000	341.7316

Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	147.58	29.9574	1.7704	0.0000	74.2182
Research & Development	13.68	2.7769	0.1641	0.0000	6.8797
Total		**233.4721**	**13.7978**	**0.0000**	**578.4172**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Bayer - Project - Y30

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	284.00	1000sqft	6.52	284,000.00	0
Research & Development	230.00	1000sqft	5.28	230,000.00	0
General Heavy Industry	71.00	1000sqft	1.63	71,000.00	0
General Light Industry	18.00	1000sqft	0.41	18,000.00	0
Manufacturing	978.00	1000sqft	22.45	978,000.00	0
Refrigerated Warehouse-No Rail	157.00	1000sqft	3.60	157,000.00	0
Enclosed Parking with Elevator	780.50	1000sqft	17.92	780,500.00	0
Parking Lot	31.22	1000sqft	0.72	31,220.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	97	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Energy intensity factors based on data for PG&E from The Climate Registry and RPS reductions

Land Use -

Construction Phase -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Vehicle Trips -

Consumer Products -

Area Coating -

Energy Use -

Grading -

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.033
tblProjectCharacteristics	CO2IntensityFactor	641.35	97
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.5104	5.3791	3.4611	7.5700e-003	0.9459	0.2336	1.1795	0.4256	0.2157	0.6413	0.0000	674.0170	674.0170	0.1643	0.0000	678.1238
2021	0.8416	8.4123	6.5684	0.0284	1.4097	0.1443	1.5540	0.3833	0.1358	0.5191	0.0000	2,633.5398	2,633.5398	0.1730	0.0000	2,637.8642
2022	0.7718	7.8205	6.1709	0.0278	1.4043	0.1225	1.5268	0.3819	0.1153	0.4972	0.0000	2,576.8894	2,576.8894	0.1661	0.0000	2,581.0425
2023	0.6854	6.3857	5.7664	0.0270	1.4043	0.1022	1.5065	0.3819	0.0961	0.4780	0.0000	2,503.7683	2,503.7683	0.1486	0.0000	2,507.4821
2024	0.6503	6.2563	5.5525	0.0267	1.4151	0.0915	1.5066	0.3848	0.0860	0.4708	0.0000	2,480.2619	2,480.2619	0.1468	0.0000	2,483.9316

2025	9.4106	1.5362	1.7698	6.5000e-003	0.3350	0.0333	0.3683	0.0907	0.0311	0.1218	0.0000	597.5649	597.5649	0.0532	0.0000	598.8940
Maximum	**9.4106**	**8.4123**	**6.5684**	**0.0284**	**1.4151**	**0.2336**	**1.5540**	**0.4256**	**0.2157**	**0.6413**	**0.0000**	**2,633.5398**	**2,633.5398**	**0.1730**	**0.0000**	**2,637.8642**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.5104	5.3791	3.4611	7.5700e-003	0.9459	0.2336	1.1795	0.4256	0.2157	0.6413	0.0000	674.0164	674.0164	0.1643	0.0000	678.1232
2021	0.8416	8.4123	6.5684	0.0284	1.4097	0.1443	1.5540	0.3833	0.1358	0.5191	0.0000	2,633.5395	2,633.5395	0.1730	0.0000	2,637.8638
2022	0.7718	7.8205	6.1709	0.0278	1.4043	0.1225	1.5268	0.3819	0.1153	0.4972	0.0000	2,576.8891	2,576.8891	0.1661	0.0000	2,581.0421
2023	0.6854	6.3857	5.7664	0.0270	1.4043	0.1022	1.5065	0.3819	0.0961	0.4780	0.0000	2,503.7679	2,503.7679	0.1486	0.0000	2,507.4818
2024	0.6503	6.2563	5.5525	0.0267	1.4151	0.0915	1.5066	0.3848	0.0860	0.4708	0.0000	2,480.2615	2,480.2615	0.1468	0.0000	2,483.9312
2025	9.4106	1.5362	1.7698	6.5000e-003	0.3350	0.0333	0.3683	0.0907	0.0311	0.1218	0.0000	597.5648	597.5648	0.0532	0.0000	598.8938
Maximum	**9.4106**	**8.4123**	**6.5684**	**0.0284**	**1.4151**	**0.2336**	**1.5540**	**0.4256**	**0.2157**	**0.6413**	**0.0000**	**2,633.5395**	**2,633.5395**	**0.1730**	**0.0000**	**2,637.8638**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**2-5-2020**	**5-4-2020**	1.1767	1.1767
2	**5-5-2020**	**8-4-2020**	1.5842	1.5842
3	**8-5-2020**	**11-4-2020**	1.7996	1.7996
4	**11-5-2020**	**2-4-2021**	2.2043	2.2043
5	**2-5-2021**	**5-4-2021**	2.2570	2.2570

6	**5-5-2021**	**8-4-2021**	2.3118	2.3118
7	**8-5-2021**	**11-4-2021**	2.3249	2.3249
8	**11-5-2021**	**2-4-2022**	2.2853	2.2853
9	**2-5-2022**	**5-4-2022**	2.1036	2.1036
10	**5-5-2022**	**8-4-2022**	2.1558	2.1558
11	**8-5-2022**	**11-4-2022**	2.1673	2.1673
12	**11-5-2022**	**2-4-2023**	2.0395	2.0395
13	**2-5-2023**	**5-4-2023**	1.7333	1.7333
14	**5-5-2023**	**8-4-2023**	1.7770	1.7770
15	**8-5-2023**	**11-4-2023**	1.7860	1.7860
16	**11-5-2023**	**2-4-2024**	1.7795	1.7795
17	**2-5-2024**	**5-4-2024**	1.6986	1.6986
18	**5-5-2024**	**8-4-2024**	1.7225	1.7225
19	**8-5-2024**	**11-4-2024**	1.7310	1.7310
20	**11-5-2024**	**2-4-2025**	1.7235	1.7235
21	**2-5-2025**	**5-4-2025**	0.8273	0.8273
22	**5-5-2025**	**8-4-2025**	3.8102	3.8102
23	**8-5-2025**	**9-30-2025**	5.0545	5.0545
		Highest	5.0545	5.0545

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	7.7656	2.1000e-004	0.0233	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0456	0.0456	1.2000e-004	0.0000	0.0485
Energy	0.2177	1.9788	1.6622	0.0119		0.1504	0.1504		0.1504	0.1504	0.0000	3,107.8729	3,107.8729	0.3657	0.0788	3,140.5050

Mobile	1.0781	9.7422	12.3133	0.0731	7.2092	0.0362	7.2454	1.9363	0.0339	1.9702	0.0000	6,804.0333	6,804.0333	0.2361	0.0000	6,809.9349
Waste						0.0000	0.0000		0.0000	0.0000	355.6929	0.0000	355.6929	21.0209	0.0000	881.2142
Water						0.0000	0.0000		0.0000	0.0000	141.6907	111.0926	252.7832	14.5908	0.3482	721.3190
Total	**9.0613**	**11.7213**	**13.9988**	**0.0850**	**7.2092**	**0.1867**	**7.3959**	**1.9363**	**0.1843**	**2.1207**	**497.3836**	**10,023.0443**	**10,520.4278**	**36.2136**	**0.4270**	**11,553.0216**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	7.7656	2.1000e-004	0.0233	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0456	0.0456	1.2000e-004	0.0000	0.0485
Energy	0.2177	1.9788	1.6622	0.0119		0.1504	0.1504		0.1504	0.1504	0.0000	3,107.8729	3,107.8729	0.3657	0.0788	3,140.5050
Mobile	1.0781	9.7422	12.3133	0.0731	7.2092	0.0362	7.2454	1.9363	0.0339	1.9702	0.0000	6,804.0333	6,804.0333	0.2361	0.0000	6,809.9349
Waste						0.0000	0.0000		0.0000	0.0000	355.6929	0.0000	355.6929	21.0209	0.0000	881.2142
Water						0.0000	0.0000		0.0000	0.0000	141.6907	111.0926	252.7832	14.5908	0.3482	721.3190
Total	**9.0613**	**11.7213**	**13.9988**	**0.0850**	**7.2092**	**0.1867**	**7.3959**	**1.9363**	**0.1843**	**2.1207**	**497.3836**	**10,023.0443**	**10,520.4278**	**36.2136**	**0.4270**	**11,553.0216**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description

1	Demolition	Demolition	2/5/2020	5/12/2020	5	70	
2	Site Preparation	Site Preparation	5/13/2020	7/7/2020	5	40	
3	Grading	Grading	7/8/2020	12/8/2020	5	110	
4	Building Construction	Building Construction	12/9/2020	3/11/2025	5	1110	
5	Paving	Paving	3/12/2025	6/24/2025	5	75	
6	Architectural Coating	Architectural Coating	6/25/2025	10/7/2025	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 275

Acres of Paving: 18.64

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 2,607,000; Non-Residential Outdoor: 869,000; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42

Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	1,019.00	418.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	204.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1159	1.1620	0.7614	1.3600e-003		0.0581	0.0581		0.0540	0.0540	0.0000	118.9951	118.9951	0.0336	0.0000	119.8349
Total	**0.1159**	**1.1620**	**0.7614**	**1.3600e-003**		**0.0581**	**0.0581**		**0.0540**	**0.0540**	**0.0000**	**118.9951**	**118.9951**	**0.0336**	**0.0000**	**119.8349**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8200e-003	1.3400e-003	0.0137	4.0000e-005	4.1500e-003	3.0000e-005	4.1800e-003	1.1000e-003	3.0000e-005	1.1300e-003	0.0000	3.6900	3.6900	1.0000e-004	0.0000	3.6924
Total	**1.8200e-003**	**1.3400e-003**	**0.0137**	**4.0000e-005**	**4.1500e-003**	**3.0000e-005**	**4.1800e-003**	**1.1000e-003**	**3.0000e-005**	**1.1300e-003**	**0.0000**	**3.6900**	**3.6900**	**1.0000e-004**	**0.0000**	**3.6924**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1159	1.1620	0.7614	1.3600e-003		0.0581	0.0581		0.0540	0.0540	0.0000	118.9950	118.9950	0.0336	0.0000	119.8348
Total	**0.1159**	**1.1620**	**0.7614**	**1.3600e-003**		**0.0581**	**0.0581**		**0.0540**	**0.0540**	**0.0000**	**118.9950**	**118.9950**	**0.0336**	**0.0000**	**119.8348**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8200e-003	1.3400e-003	0.0137	4.0000e-005	4.1500e-003	3.0000e-005	4.1800e-003	1.1000e-003	3.0000e-005	1.1300e-003	0.0000	3.6900	3.6900	1.0000e-004	0.0000	3.6924
Total	**1.8200e-003**	**1.3400e-003**	**0.0137**	**4.0000e-005**	**4.1500e-003**	**3.0000e-005**	**4.1800e-003**	**1.1000e-003**	**3.0000e-005**	**1.1300e-003**	**0.0000**	**3.6900**	**3.6900**	**1.0000e-004**	**0.0000**	**3.6924**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3613	0.0000	0.3613	0.1986	0.0000	0.1986	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0815	0.8484	0.4303	7.6000e-004		0.0440	0.0440		0.0404	0.0404	0.0000	66.8614	66.8614	0.0216	0.0000	67.4020
Total	**0.0815**	**0.8484**	**0.4303**	**7.6000e-004**	**0.3613**	**0.0440**	**0.4053**	**0.1986**	**0.0404**	**0.2390**	**0.0000**	**66.8614**	**66.8614**	**0.0216**	**0.0000**	**67.4020**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2400e-003	9.2000e-004	9.4200e-003	3.0000e-005	2.8500e-003	2.0000e-005	2.8700e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.5303	2.5303	7.0000e-005	0.0000	2.5319

Total	**1.2400e-003**	**9.2000e-004**	**9.4200e-003**	**3.0000e-005**	**2.8500e-003**	**2.0000e-005**	**2.8700e-003**	**7.6000e-004**	**2.0000e-005**	**7.8000e-004**	**0.0000**	**2.5303**	**2.5303**	**7.0000e-005**	**0.0000**	**2.5319**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3613	0.0000	0.3613	0.1986	0.0000	0.1986	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0815	0.8484	0.4303	7.6000e-004		0.0440	0.0440		0.0404	0.0404	0.0000	66.8613	66.8613	0.0216	0.0000	67.4019
Total	**0.0815**	**0.8484**	**0.4303**	**7.6000e-004**	**0.3613**	**0.0440**	**0.4053**	**0.1986**	**0.0404**	**0.2390**	**0.0000**	**66.8613**	**66.8613**	**0.0216**	**0.0000**	**67.4019**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2400e-003	9.2000e-004	9.4200e-003	3.0000e-005	2.8500e-003	2.0000e-005	2.8700e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.5303	2.5303	7.0000e-005	0.0000	2.5319
Total	**1.2400e-003**	**9.2000e-004**	**9.4200e-003**	**3.0000e-005**	**2.8500e-003**	**2.0000e-005**	**2.8700e-003**	**7.6000e-004**	**2.0000e-005**	**7.8000e-004**	**0.0000**	**2.5303**	**2.5303**	**7.0000e-005**	**0.0000**	**2.5319**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4770	0.0000	0.4770	0.1978	0.0000	0.1978	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2448	2.7609	1.7577	3.4100e-003		0.1196	0.1196		0.1100	0.1100	0.0000	299.6636	299.6636	0.0969	0.0000	302.0865
Total	**0.2448**	**2.7609**	**1.7577**	**3.4100e-003**	**0.4770**	**0.1196**	**0.5966**	**0.1978**	**0.1100**	**0.3078**	**0.0000**	**299.6636**	**299.6636**	**0.0969**	**0.0000**	**302.0865**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-003	2.8100e-003	0.0288	9.0000e-005	8.7000e-003	6.0000e-005	8.7600e-003	2.3100e-003	6.0000e-005	2.3700e-003	0.0000	7.7314	7.7314	2.0000e-004	0.0000	7.7364
Total	**3.8000e-003**	**2.8100e-003**	**0.0288**	**9.0000e-005**	**8.7000e-003**	**6.0000e-005**	**8.7600e-003**	**2.3100e-003**	**6.0000e-005**	**2.3700e-003**	**0.0000**	**7.7314**	**7.7314**	**2.0000e-004**	**0.0000**	**7.7364**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					0.4770	0.0000	0.4770	0.1978	0.0000	0.1978	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2448	2.7609	1.7577	3.4100e-003		0.1196	0.1196		0.1100	0.1100	0.0000	299.6633	299.6633	0.0969	0.0000	302.0862
Total	**0.2448**	**2.7609**	**1.7577**	**3.4100e-003**	**0.4770**	**0.1196**	**0.5966**	**0.1978**	**0.1100**	**0.3078**	**0.0000**	**299.6633**	**299.6633**	**0.0969**	**0.0000**	**302.0862**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.8000e-003	2.8100e-003	0.0288	9.0000e-005	8.7000e-003	6.0000e-005	8.7600e-003	2.3100e-003	6.0000e-005	2.3700e-003	0.0000	7.7314	7.7314	2.0000e-004	0.0000	7.7364
Total	**3.8000e-003**	**2.8100e-003**	**0.0288**	**9.0000e-005**	**8.7000e-003**	**6.0000e-005**	**8.7600e-003**	**2.3100e-003**	**6.0000e-005**	**2.3700e-003**	**0.0000**	**7.7314**	**7.7314**	**2.0000e-004**	**0.0000**	**7.7364**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0180	0.1631	0.1432	2.3000e-004		9.4900e-003	9.4900e-003		8.9300e-003	8.9300e-003	0.0000	19.6869	19.6869	4.8000e-003	0.0000	19.8069
Total	**0.0180**	**0.1631**	**0.1432**	**2.3000e-004**		**9.4900e-003**	**9.4900e-003**		**8.9300e-003**	**8.9300e-003**	**0.0000**	**19.6869**	**19.6869**	**4.8000e-003**	**0.0000**	**19.8069**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0133	0.4176	0.0900	9.8000e-004	0.0233	1.9400e-003	0.0253	6.7500e-003	1.8500e-003	8.6000e-003	0.0000	93.9805	93.9805	5.4000e-003	0.0000	94.1156
Worker	0.0300	0.0221	0.2266	6.7000e-004	0.0685	4.8000e-004	0.0690	0.0182	4.4000e-004	0.0187	0.0000	60.8778	60.8778	1.5700e-003	0.0000	60.9171
Total	**0.0433**	**0.4397**	**0.3166**	**1.6500e-003**	**0.0918**	**2.4200e-003**	**0.0942**	**0.0250**	**2.2900e-003**	**0.0273**	**0.0000**	**154.8583**	**154.8583**	**6.9700e-003**	**0.0000**	**155.0328**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0180	0.1631	0.1432	2.3000e-004		9.4900e-003	9.4900e-003		8.9300e-003	8.9300e-003	0.0000	19.6868	19.6868	4.8000e-003	0.0000	19.8069
Total	**0.0180**	**0.1631**	**0.1432**	**2.3000e-004**		**9.4900e-003**	**9.4900e-003**		**8.9300e-003**	**8.9300e-003**	**0.0000**	**19.6868**	**19.6868**	**4.8000e-003**	**0.0000**	**19.8069**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0133	0.4176	0.0900	9.8000e-004	0.0233	1.9400e-003	0.0253	6.7500e-003	1.8500e-003	8.6000e-003	0.0000	93.9805	93.9805	5.4000e-003	0.0000	94.1156
Worker	0.0300	0.0221	0.2266	6.7000e-004	0.0685	4.8000e-004	0.0690	0.0182	4.4000e-004	0.0187	0.0000	60.8778	60.8778	1.5700e-003	0.0000	60.9171
Total	**0.0433**	**0.4397**	**0.3166**	**1.6500e-003**	**0.0918**	**2.4200e-003**	**0.0942**	**0.0250**	**2.2900e-003**	**0.0273**	**0.0000**	**154.8583**	**154.8583**	**6.9700e-003**	**0.0000**	**155.0328**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2867	302.2867	0.0729	0.0000	304.1099
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**	**0.0000**	**302.2867**	**302.2867**	**0.0729**	**0.0000**	**304.1099**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.1689	5.8348	1.2359	0.0149	0.3583	0.0122	0.3704	0.1036	0.0116	0.1153	0.0000	1,429.0235	1,429.0235	0.0785	0.0000	1,430.9857
Worker	0.4247	0.3026	3.1695	9.9800e-003	1.0514	7.0700e-003	1.0585	0.2797	6.5100e-003	0.2862	0.0000	902.2297	902.2297	0.0216	0.0000	902.7686
Total	**0.5935**	**6.1374**	**4.4054**	**0.0249**	**1.4097**	**0.0192**	**1.4289**	**0.3833**	**0.0182**	**0.4015**	**0.0000**	**2,331.2532**	**2,331.2532**	**0.1001**	**0.0000**	**2,333.7543**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2863	302.2863	0.0729	0.0000	304.1095
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**	**0.0000**	**302.2863**	**302.2863**	**0.0729**	**0.0000**	**304.1095**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1689	5.8348	1.2359	0.0149	0.3583	0.0122	0.3704	0.1036	0.0116	0.1153	0.0000	1,429.0235	1,429.0235	0.0785	0.0000	1,430.9857
Worker	0.4247	0.3026	3.1695	9.9800e-003	1.0514	7.0700e-003	1.0585	0.2797	6.5100e-003	0.2862	0.0000	902.2297	902.2297	0.0216	0.0000	902.7686
Total	**0.5935**	**6.1374**	**4.4054**	**0.0249**	**1.4097**	**0.0192**	**1.4289**	**0.3833**	**0.0182**	**0.4015**	**0.0000**	**2,331.2532**	**2,331.2532**	**0.1001**	**0.0000**	**2,333.7543**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2428	301.2428	0.0722	0.0000	303.0471
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2428**	**301.2428**	**0.0722**	**0.0000**	**303.0471**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1572	5.5206	1.1532	0.0147	0.3569	0.0105	0.3674	0.1032	0.0100	0.1133	0.0000	1,409.6284	1,409.6284	0.0747	0.0000	1,411.4966
Worker	0.3928	0.2699	2.8905	9.5700e-003	1.0474	6.8600e-003	1.0543	0.2786	6.3200e-003	0.2849	0.0000	866.0182	866.0182	0.0192	0.0000	866.4989
Total	**0.5500**	**5.7905**	**4.0437**	**0.0243**	**1.4043**	**0.0174**	**1.4216**	**0.3819**	**0.0164**	**0.3982**	**0.0000**	**2,275.6466**	**2,275.6466**	**0.0940**	**0.0000**	**2,277.9954**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2425	301.2425	0.0722	0.0000	303.0467
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2425**	**301.2425**	**0.0722**	**0.0000**	**303.0467**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1572	5.5206	1.1532	0.0147	0.3569	0.0105	0.3674	0.1032	0.0100	0.1133	0.0000	1,409.6284	1,409.6284	0.0747	0.0000	1,411.4966
Worker	0.3928	0.2699	2.8905	9.5700e-003	1.0474	6.8600e-003	1.0543	0.2786	6.3200e-003	0.2849	0.0000	866.0182	866.0182	0.0192	0.0000	866.4989
Total	**0.5500**	**5.7905**	**4.0437**	**0.0243**	**1.4043**	**0.0174**	**1.4216**	**0.3819**	**0.0164**	**0.3982**	**0.0000**	**2,275.6466**	**2,275.6466**	**0.0940**	**0.0000**	**2,277.9954**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2045	1.8700	2.1117	3.5000e-003		0.0910	0.0910		0.0856	0.0856	0.0000	301.3462	301.3462	0.0717	0.0000	303.1383

Total	**0.2045**	**1.8700**	**2.1117**	**3.5000e-003**		**0.0910**	**0.0910**		**0.0856**	**0.0856**	**0.0000**	**301.3462**	**301.3462**	**0.0717**	**0.0000**	**303.1383**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1152	4.2736	1.0080	0.0143	0.3569	4.5300e-003	0.3614	0.1033	4.3300e-003	0.1076	0.0000	1,369.5252	1,369.5252	0.0597	0.0000	1,371.0170
Worker	0.3657	0.2421	2.6467	9.2100e-003	1.0474	6.7000e-003	1.0541	0.2786	6.1700e-003	0.2848	0.0000	832.8970	832.8970	0.0172	0.0000	833.3269
Total	**0.4809**	**4.5157**	**3.6547**	**0.0235**	**1.4043**	**0.0112**	**1.4155**	**0.3819**	**0.0105**	**0.3924**	**0.0000**	**2,202.4221**	**2,202.4221**	**0.0769**	**0.0000**	**2,204.3438**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2045	1.8700	2.1117	3.5000e-003		0.0910	0.0910		0.0856	0.0856	0.0000	301.3458	301.3458	0.0717	0.0000	303.1380
Total	**0.2045**	**1.8700**	**2.1117**	**3.5000e-003**		**0.0910**	**0.0910**		**0.0856**	**0.0856**	**0.0000**	**301.3458**	**301.3458**	**0.0717**	**0.0000**	**303.1380**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1152	4.2736	1.0080	0.0143	0.3569	4.5300e-003	0.3614	0.1033	4.3300e-003	0.1076	0.0000	1,369.5252	1,369.5252	0.0597	0.0000	1,371.0170
Worker	0.3657	0.2421	2.6467	9.2100e-003	1.0474	6.7000e-003	1.0541	0.2786	6.1700e-003	0.2848	0.0000	832.8970	832.8970	0.0172	0.0000	833.3269
Total	**0.4809**	**4.5157**	**3.6547**	**0.0235**	**1.4043**	**0.0112**	**1.4155**	**0.3819**	**0.0105**	**0.3924**	**0.0000**	**2,202.4221**	**2,202.4221**	**0.0769**	**0.0000**	**2,204.3438**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1928	1.7611	2.1179	3.5300e-003		0.0803	0.0803		0.0756	0.0756	0.0000	303.7223	303.7223	0.0718	0.0000	305.5179
Total	**0.1928**	**1.7611**	**2.1179**	**3.5300e-003**		**0.0803**	**0.0803**		**0.0756**	**0.0756**	**0.0000**	**303.7223**	**303.7223**	**0.0718**	**0.0000**	**305.5179**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1127	4.2753	0.9728	0.0143	0.3597	4.5000e-003	0.3642	0.1040	4.3100e-003	0.1084	0.0000	1,370.5022	1,370.5022	0.0594	0.0000	1,371.9868
Worker	0.3448	0.2199	2.4619	8.9100e-003	1.0555	6.6100e-003	1.0621	0.2808	6.0900e-003	0.2869	0.0000	806.0374	806.0374	0.0156	0.0000	806.4269
Total	**0.4575**	**4.4951**	**3.4347**	**0.0232**	**1.4151**	**0.0111**	**1.4262**	**0.3848**	**0.0104**	**0.3952**	**0.0000**	**2,176.5396**	**2,176.5396**	**0.0750**	**0.0000**	**2,178.4137**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1928	1.7611	2.1179	3.5300e-003		0.0803	0.0803		0.0756	0.0756	0.0000	303.7220	303.7220	0.0718	0.0000	305.5175
Total	**0.1928**	**1.7611**	**2.1179**	**3.5300e-003**		**0.0803**	**0.0803**		**0.0756**	**0.0756**	**0.0000**	**303.7220**	**303.7220**	**0.0718**	**0.0000**	**305.5175**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1127	4.2753	0.9728	0.0143	0.3597	4.5000e-003	0.3642	0.1040	4.3100e-003	0.1084	0.0000	1,370.5022	1,370.5022	0.0594	0.0000	1,371.9868

Worker	0.3448	0.2199	2.4619	8.9100e-003	1.0555	6.6100e-003	1.0621	0.2808	6.0900e-003	0.2869	0.0000	806.0374	806.0374	0.0156	0.0000	806.4269
Total	**0.4575**	**4.4951**	**3.4347**	**0.0232**	**1.4151**	**0.0111**	**1.4262**	**0.3848**	**0.0104**	**0.3952**	**0.0000**	**2,176.5396**	**2,176.5396**	**0.0750**	**0.0000**	**2,178.4137**

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0342	0.3117	0.4021	6.7000e-004		0.0132	0.0132		0.0124	0.0124	0.0000	57.9799	57.9799	0.0136	0.0000	58.3206
Total	**0.0342**	**0.3117**	**0.4021**	**6.7000e-004**		**0.0132**	**0.0132**		**0.0124**	**0.0124**	**0.0000**	**57.9799**	**57.9799**	**0.0136**	**0.0000**	**58.3206**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0209	0.8093	0.1790	2.7100e-003	0.0686	8.5000e-004	0.0695	0.0199	8.1000e-004	0.0207	0.0000	259.8298	259.8298	0.0112	0.0000	260.1091
Worker	0.0619	0.0381	0.4341	1.6300e-003	0.2014	1.2400e-003	0.2027	0.0536	1.1400e-003	0.0547	0.0000	147.5439	147.5439	2.6900e-003	0.0000	147.6112
Total	**0.0829**	**0.8474**	**0.6132**	**4.3400e-003**	**0.2701**	**2.0900e-003**	**0.2722**	**0.0734**	**1.9500e-003**	**0.0754**	**0.0000**	**407.3737**	**407.3737**	**0.0139**	**0.0000**	**407.7203**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0342	0.3117	0.4021	6.7000e-004		0.0132	0.0132		0.0124	0.0124	0.0000	57.9798	57.9798	0.0136	0.0000	58.3205
Total	**0.0342**	**0.3117**	**0.4021**	**6.7000e-004**		**0.0132**	**0.0132**		**0.0124**	**0.0124**	**0.0000**	**57.9798**	**57.9798**	**0.0136**	**0.0000**	**58.3205**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0209	0.8093	0.1790	2.7100e-003	0.0686	8.5000e-004	0.0695	0.0199	8.1000e-004	0.0207	0.0000	259.8298	259.8298	0.0112	0.0000	260.1091
Worker	0.0619	0.0381	0.4341	1.6300e-003	0.2014	1.2400e-003	0.2027	0.0536	1.1400e-003	0.0547	0.0000	147.5439	147.5439	2.6900e-003	0.0000	147.6112
Total	**0.0829**	**0.8474**	**0.6132**	**4.3400e-003**	**0.2701**	**2.0900e-003**	**0.2722**	**0.0734**	**1.9500e-003**	**0.0754**	**0.0000**	**407.3737**	**407.3737**	**0.0139**	**0.0000**	**407.7203**

3.6 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.0343	0.3218	0.5467	8.5000e-004		0.0157	0.0157		0.0144	0.0144	0.0000	75.0722	75.0722	0.0243	0.0000	75.6792
Paving	9.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0353**	**0.3218**	**0.5467**	**8.5000e-004**		**0.0157**	**0.0157**		**0.0144**	**0.0144**	**0.0000**	**75.0722**	**75.0722**	**0.0243**	**0.0000**	**75.6792**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3700e-003	8.4000e-004	9.5900e-003	4.0000e-005	4.4500e-003	3.0000e-005	4.4700e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	3.2578	3.2578	6.0000e-005	0.0000	3.2593
Total	**1.3700e-003**	**8.4000e-004**	**9.5900e-003**	**4.0000e-005**	**4.4500e-003**	**3.0000e-005**	**4.4700e-003**	**1.1800e-003**	**3.0000e-005**	**1.2100e-003**	**0.0000**	**3.2578**	**3.2578**	**6.0000e-005**	**0.0000**	**3.2593**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0343	0.3218	0.5467	8.5000e-004		0.0157	0.0157		0.0144	0.0144	0.0000	75.0721	75.0721	0.0243	0.0000	75.6791
Paving	9.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**0.0353**	**0.3218**	**0.5467**	**8.5000e-004**		**0.0157**	**0.0157**		**0.0144**	**0.0144**	**0.0000**	**75.0721**	**75.0721**	**0.0243**	**0.0000**	**75.6791**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3700e-003	8.4000e-004	9.5900e-003	4.0000e-005	4.4500e-003	3.0000e-005	4.4700e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	3.2578	3.2578	6.0000e-005	0.0000	3.2593
Total	**1.3700e-003**	**8.4000e-004**	**9.5900e-003**	**4.0000e-005**	**4.4500e-003**	**3.0000e-005**	**4.4700e-003**	**1.1800e-003**	**3.0000e-005**	**1.2100e-003**	**0.0000**	**3.2578**	**3.2578**	**6.0000e-005**	**0.0000**	**3.2593**

3.7 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	9.2319					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4100e-003	0.0430	0.0678	1.1000e-004		1.9300e-003	1.9300e-003		1.9300e-003	1.9300e-003	0.0000	9.5747	9.5747	5.2000e-004	0.0000	9.5878
Total	**9.2383**	**0.0430**	**0.0678**	**1.1000e-004**		**1.9300e-003**	**1.9300e-003**		**1.9300e-003**	**1.9300e-003**	**0.0000**	**9.5747**	**9.5747**	**5.2000e-004**	**0.0000**	**9.5878**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0186	0.0114	0.1304	4.9000e-004	0.0605	3.7000e-004	0.0609	0.0161	3.4000e-004	0.0164	0.0000	44.3066	44.3066	8.1000e-004	0.0000	44.3268
Total	**0.0186**	**0.0114**	**0.1304**	**4.9000e-004**	**0.0605**	**3.7000e-004**	**0.0609**	**0.0161**	**3.4000e-004**	**0.0164**	**0.0000**	**44.3066**	**44.3066**	**8.1000e-004**	**0.0000**	**44.3268**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	9.2319					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4100e-003	0.0430	0.0678	1.1000e-004		1.9300e-003	1.9300e-003		1.9300e-003	1.9300e-003	0.0000	9.5747	9.5747	5.2000e-004	0.0000	9.5878
Total	**9.2383**	**0.0430**	**0.0678**	**1.1000e-004**		**1.9300e-003**	**1.9300e-003**		**1.9300e-003**	**1.9300e-003**	**0.0000**	**9.5747**	**9.5747**	**5.2000e-004**	**0.0000**	**9.5878**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0186	0.0114	0.1304	4.9000e-004	0.0605	3.7000e-004	0.0609	0.0161	3.4000e-004	0.0164	0.0000	44.3066	44.3066	8.1000e-004	0.0000	44.3268
Total	**0.0186**	**0.0114**	**0.1304**	**4.9000e-004**	**0.0605**	**3.7000e-004**	**0.0609**	**0.0161**	**3.4000e-004**	**0.0164**	**0.0000**	**44.3066**	**44.3066**	**8.1000e-004**	**0.0000**	**44.3268**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0781	9.7422	12.3133	0.0731	7.2092	0.0362	7.2454	1.9363	0.0339	1.9702	0.0000	6,804.0333	6,804.0333	0.2361	0.0000	6,809.9349
Unmitigated	1.0781	9.7422	12.3133	0.0731	7.2092	0.0362	7.2454	1.9363	0.0339	1.9702	0.0000	6,804.0333	6,804.0333	0.2361	0.0000	6,809.9349

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Enclosed Parking with Elevator	0.00	0.00	0.00		
General Heavy Industry	106.50	106.50	106.50	310,928	310,928
General Light Industry	125.46	23.76	12.24	276,645	276,645
General Office Building	3,132.52	698.64	298.20	5,687,421	5,687,421
Manufacturing	3,735.96	1,457.22	606.36	8,651,504	8,651,504
Parking Lot	0.00	0.00	0.00		
Refrigerated Warehouse-No Rail	263.76	263.76	263.76	770,050	770,050
Research & Development	1,865.30	437.00	255.30	3,587,084	3,587,084

Total	9,229.50	2,986.88	1,542.36	19,283,632	19,283,632

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Manufacturing	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Refrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.566131	0.035263	0.188976	0.102013	0.011508	0.005051	0.027665	0.053145	0.002326	0.001628	0.005241	0.000420	0.000634
General Heavy Industry	0.566131	0.035263	0.188976	0.102013	0.011508	0.005051	0.027665	0.053145	0.002326	0.001628	0.005241	0.000420	0.000634
General Light Industry	0.566131	0.035263	0.188976	0.102013	0.011508	0.005051	0.027665	0.053145	0.002326	0.001628	0.005241	0.000420	0.000634
General Office Building	0.566131	0.035263	0.188976	0.102013	0.011508	0.005051	0.027665	0.053145	0.002326	0.001628	0.005241	0.000420	0.000634
Manufacturing	0.566131	0.035263	0.188976	0.102013	0.011508	0.005051	0.027665	0.053145	0.002326	0.001628	0.005241	0.000420	0.000634
Parking Lot	0.566131	0.035263	0.188976	0.102013	0.011508	0.005051	0.027665	0.053145	0.002326	0.001628	0.005241	0.000420	0.000634
Refrigerated Warehouse-No Rail	0.566131	0.035263	0.188976	0.102013	0.011508	0.005051	0.027665	0.053145	0.002326	0.001628	0.005241	0.000420	0.000634
Research & Development	0.566131	0.035263	0.188976	0.102013	0.011508	0.005051	0.027665	0.053145	0.002326	0.001628	0.005241	0.000420	0.000634

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	953.6933	953.6933	0.3245	0.0393	973.5243
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	953.6933	953.6933	0.3245	0.0393	973.5243
NaturalGas Mitigated	0.2177	1.9788	1.6622	0.0119		0.1504	0.1504		0.1504	0.1504	0.0000	2,154.1795	2,154.1795	0.0413	0.0395	2,166.9808
NaturalGas Unmitigated	0.2177	1.9788	1.6622	0.0119		0.1504	0.1504		0.1504	0.1504	0.0000	2,154.1795	2,154.1795	0.0413	0.0395	2,166.9808

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	1.75725e+006	9.4800e-003	0.0861	0.0724	5.2000e-004		6.5500e-003	6.5500e-003		6.5500e-003	6.5500e-003	0.0000	93.7736	93.7736	1.8000e-003	1.7200e-003	94.3308
General Light Industry	445500	2.4000e-003	0.0218	0.0183	1.3000e-004		1.6600e-003	1.6600e-003		1.6600e-003	1.6600e-003	0.0000	23.7736	23.7736	4.6000e-004	4.4000e-004	23.9149
General Office Building	5.48972e+006	0.0296	0.2691	0.2261	1.6100e-003		0.0205	0.0205		0.0205	0.0205	0.0000	292.9524	292.9524	5.6100e-003	5.3700e-003	294.6932
Manufacturing	2.42055e+007	0.1305	1.1865	0.9967	7.1200e-003		0.0902	0.0902		0.0902	0.0902	0.0000	1,291.6977	1,291.6977	0.0248	0.0237	1,299.3736
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	2.77733e+006	0.0150	0.1361	0.1144	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	148.2089	148.2089	2.8400e-003	2.7200e-003	149.0896
Research & Development	5.6925e+006	0.0307	0.2790	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212	0.0000	303.7735	303.7735	5.8200e-003	5.5700e-003	305.5787

Total		**0.2177**	**1.9788**	**1.6622**	**0.0119**		**0.1504**	**0.1504**		**0.1504**	**0.1504**	**0.0000**	**2,154.1796**	**2,154.1796**	**0.0413**	**0.0395**	**2,166.9807**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	1.75725e+006	9.4800e-003	0.0861	0.0724	5.2000e-004		6.5500e-003	6.5500e-003		6.5500e-003	6.5500e-003	0.0000	93.7736	93.7736	1.8000e-003	1.7200e-003	94.3308
General Light Industry	445500	2.4000e-003	0.0218	0.0183	1.3000e-004		1.6600e-003	1.6600e-003		1.6600e-003	1.6600e-003	0.0000	23.7736	23.7736	4.6000e-004	4.4000e-004	23.9149
General Office Building	5.48972e+006	0.0296	0.2691	0.2261	1.6100e-003		0.0205	0.0205		0.0205	0.0205	0.0000	292.9524	292.9524	5.6100e-003	5.3700e-003	294.6932
Manufacturing	2.42055e+007	0.1305	1.1865	0.9967	7.1200e-003		0.0902	0.0902		0.0902	0.0902	0.0000	1,291.6977	1,291.6977	0.0248	0.0237	1,299.3736
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	2.77733e+006	0.0150	0.1361	0.1144	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	148.2089	148.2089	2.8400e-003	2.7200e-003	149.0896
Research & Development	5.6925e+006	0.0307	0.2790	0.2344	1.6700e-003		0.0212	0.0212		0.0212	0.0212	0.0000	303.7735	303.7735	5.8200e-003	5.5700e-003	305.5787
Total		**0.2177**	**1.9788**	**1.6622**	**0.0119**		**0.1504**	**0.1504**		**0.1504**	**0.1504**	**0.0000**	**2,154.1796**	**2,154.1796**	**0.0413**	**0.0395**	**2,166.9807**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	4.57373e+006	201.2371	0.0685	8.3000e-003	205.4216

General Heavy Industry	536760	23.6166	8.0300e-003	9.7000e-004	24.1077
General Light Industry	136080	5.9873	2.0400e-003	2.5000e-004	6.1118
General Office Building	3.54432e+006	155.9446	0.0531	6.4300e-003	159.1873
Manufacturing	7.39368e+006	325.3105	0.1107	0.0134	332.0750
Parking Lot	10927	0.4808	1.6000e-004	2.0000e-005	0.4908
Refrigerated Warehouse-No Rail	3.74131e+006	164.6119	0.0560	6.7900e-003	168.0348
Research & Development	1.7388e+006	76.5045	0.0260	3.1500e-003	78.0953
Total		**953.6933**	**0.3244**	**0.0393**	**973.5242**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	4.57373e+006	201.2371	0.0685	8.3000e-003	205.4216
General Heavy Industry	536760	23.6166	8.0300e-003	9.7000e-004	24.1077
General Light Industry	136080	5.9873	2.0400e-003	2.5000e-004	6.1118
General Office Building	3.54432e+006	155.9446	0.0531	6.4300e-003	159.1873
Manufacturing	7.39368e+006	325.3105	0.1107	0.0134	332.0750
Parking Lot	10927	0.4808	1.6000e-004	2.0000e-005	0.4908
Refrigerated Warehouse-No Rail	3.74131e+006	164.6119	0.0560	6.7900e-003	168.0348
Research & Development	1.7388e+006	76.5045	0.0260	3.1500e-003	78.0953

Total		**953.6933**	**0.3244**	**0.0393**	**973.5242**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	7.7656	2.1000e-004	0.0233	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0456	0.0456	1.2000e-004	0.0000	0.0485
Unmitigated	7.7656	2.1000e-004	0.0233	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0456	0.0456	1.2000e-004	0.0000	0.0485

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.9232					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.8402					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.1300e-003	2.1000e-004	0.0233	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0456	0.0456	1.2000e-004	0.0000	0.0485
Total	**7.7656**	**2.1000e-004**	**0.0233**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0456**	**0.0456**	**1.2000e-004**	**0.0000**	**0.0485**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.9232					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.8402					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.1300e-003	2.1000e-004	0.0233	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0456	0.0456	1.2000e-004	0.0000	0.0485
Total	**7.7656**	**2.1000e-004**	**0.0233**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0456**	**0.0456**	**1.2000e-004**	**0.0000**	**0.0485**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	252.7832	14.5908	0.3482	721.3190
Unmitigated	252.7832	14.5908	0.3482	721.3190

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	16.4187 / 0	9.1178	0.5363	0.0128	26.3388
General Light Industry	4.1625 / 0	2.3116	0.1360	3.2400e-003	6.6774
General Office Building	50.4764 / 30.9371	32.7952	1.6505	0.0395	85.8368
Manufacturing	226.162 / 0	125.5947	7.3878	0.1762	362.8070
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	36.3062 / 0	20.1619	1.1860	0.0283	58.2420
Research & Development	113.09 / 0	62.8020	3.6942	0.0881	181.4169
Total		**252.7832**	**14.5908**	**0.3482**	**721.3190**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	16.4187 / 0	9.1178	0.5363	0.0128	26.3388
General Light Industry	4.1625 / 0	2.3116	0.1360	3.2400e-003	6.6774
General Office Building	50.4764 / 30.9371	32.7952	1.6505	0.0395	85.8368

Manufacturing	226.162 / 0	125.5947	7.3878	0.1762	362.8070
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	36.3062 / 0	20.1619	1.1860	0.0283	58.2420
Research & Development	113.09 / 0	62.8020	3.6942	0.0881	181.4169
Total		**252.7832**	**14.5908**	**0.3482**	**721.3190**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	355.6929	21.0209	0.0000	881.2142
Unmitigated	355.6929	21.0209	0.0000	881.2142

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	88.04	17.8713	1.0562	0.0000	44.2755
General Light Industry	22.32	4.5308	0.2678	0.0000	11.2248
General Office Building	264.12	53.6140	3.1685	0.0000	132.8264
Manufacturing	1212.72	246.1712	14.5483	0.0000	609.8787
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	147.58	29.9574	1.7704	0.0000	74.2182
Research & Development	17.48	3.5483	0.2097	0.0000	8.7907
Total		**355.6929**	**21.0209**	**0.0000**	**881.2142**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	88.04	17.8713	1.0562	0.0000	44.2755
General Light Industry	22.32	4.5308	0.2678	0.0000	11.2248
General Office Building	264.12	53.6140	3.1685	0.0000	132.8264
Manufacturing	1212.72	246.1712	14.5483	0.0000	609.8787
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	147.58	29.9574	1.7704	0.0000	74.2182
Research & Development	17.48	3.5483	0.2097	0.0000	8.7907

Total		**355.6929**	**21.0209**	**0.0000**	**881.2142**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation