Appendix B Air Quality and GHG Modeling

Appendices

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Air Quality and Greenhouse Gas Background and Modeling Data

AIR QUALITY

Climate/Meteorology

SOUTH COAST AIR BASIN

The project site lies in the South Coast Air Basin (SoCAB), which includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The SoCAB is in a coastal plain with connecting broad valleys and low hills and is bounded by the Pacific Ocean in the southwest quadrant, with high mountains forming the remainder of the perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild weather pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds (SCAQMD 2005).

Temperature and Precipitation

The annual average temperature varies little throughout the SoCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station nearest to the project site with sufficient temperature data is the Yorba Linda Station (ID No. 049847). The lowest average low is reported at 41.7°F in January while the highest average high is 88.4°F in August (WRCC 2018a).

In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all rain falls from October through April. Summer rainfall is normally restricted to widely scattered thundershowers near the coast, with slightly heavier shower activity in the east and over the mountains. Rainfall averages 13.34 inches per year in the project area according to the data from the Brea Berry & Imper climatological station (ID No. 041054) located closest to the project site (WRCC 2018b).

Humidity

Although the SoCAB has a semiarid climate, the air near the earth's surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the SoCAB by offshore winds, the "ocean effect" is dominant. Periods of heavy fog, especially along the coast, are frequent. Low clouds, often referred to as high fog, are a characteristic climatic feature. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the SoCAB (SCAQMD 2005).

Wind

Wind patterns across the south coastal region are characterized by westerly or southwesterly onshore winds during the day and by easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season.

Between periods of wind, periods of air stagnation may occur, both in the morning and evening hours. Air stagnation is one of the critical determinants of air quality conditions on any given day. During the winter and fall months, surface high-pressure systems over the SoCAB, combined with other meteorological conditions, can result in very strong, downslope Santa Ana winds. These winds normally continue a few days before predominant meteorological conditions are reestablished.

The mountain ranges to the east affect the transport and diffusion of pollutants by inhibiting their eastward transport. Air quality in the SoCAB generally ranges from fair to poor and is similar to air quality in most of coastal southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions (SCAQMD 2005).

Inversions

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. These are the marine/subsidence inversion and the radiation inversion. The combination of winds and inversions are critical determinants in leading to the highly degraded air quality in summer and the generally good air quality in the winter in the project area (SCAQMD 2005).

Air Quality Regulations

The proposed project has the potential to release gaseous emissions of criteria pollutants and dust into the ambient air; therefore, it falls under the ambient air quality standards promulgated at the local, state, and federal levels. The project site is in the SoCAB and is subject to the rules and regulations imposed by the South Coast Air Quality Management District (SCAQMD). However, SCAQMD reports to California Air Resources board (CARB), and all criteria emissions are also governed by the California and national Ambient Air Quality Standards (AAQS). Federal, state, regional, and local laws, regulations, plans, or guidelines that are potentially applicable to the proposed project are summarized below.

AMBIENT AIR QUALITY STANDARDS

The Clean Air Act (CAA) was passed in 1963 by the US Congress and has been amended several times. The 1970 Clean Air Act amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including nonattainment requirements for areas not meeting National AAQS and the Prevention of Significant Deterioration program. The 1990 amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the United States. The CAA allows states to adopt more stringent standards or to include other pollution species. The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the state

to achieve and maintain the California AAQS by the earliest practical date. The California AAQS tend to be more restrictive than the National AAQS, based on even greater health and welfare concerns.

These National AAQS and California AAQS are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect "sensitive receptors" most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Both California and the federal government have established health-based AAQS for seven air pollutants. As shown in Table 1, *Ambient Air Quality Standards for Criteria Pollutants*, these pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb). In addition, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Table 1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Ozone (O_3)[3]	1 hour	0.09 ppm	*	Motor vehicles, paints, coatings, and solvents.
	8 hours	0.070 ppm	0.070 ppm	
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	*	0.030 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	0.075 ppm	
	24 hours	0.04 ppm	0.14 ppm	
Respirable Coarse Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	*	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	50 µg/m^3	150 µg/m^3	
Respirable Fine Particulate Matter ($PM_{2.5}$)[4]	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	*	35 µg/m^3	

Table 1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Lead (Pb)	30-Day Average	1.5 μg/m^3	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarter	*	1.5 μg/m^3	
	Rolling 3-Month Average	*	0.15 μg/m^3	
Sulfates (SO_4)[5]	24 hours	25 μg/m^3	*	Industrial processes.
Visibility Reducing Particles	8 hours	ExCo =0.23/km visibility of 10≥ miles	No Federal Standard	Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.
Hydrogen Sulfide	1 hour	0.03 ppm	No Federal Standard	Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.
Vinyl Chloride	24 hour	0.01 ppm	No Federal Standard	Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

Source: CARB 2016.

Notes: ppm: parts per million; μg/m^3: micrograms per cubic meter

* Standard has not been established for this pollutant/duration by this entity.

1 California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 National standards (other than O_3, PM, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

3 On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

4 On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m^3 to 12.0 μg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

5 On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. The 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

California has also adopted a host of other regulations that reduce criteria pollutant emissions, including:

- AB 1493: Pavley Fuel Efficiency Standards
- Title 20 California Code of Regulations (CCR): Appliance Energy Efficiency Standards
- Title 24, Part 6, CCR: Building and Energy Efficiency Standards
- Title 24, Part 11, CCR: Green Building Standards Code

CRITERIA AIR POLLUTANTS

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law. Air pollutants are categorized as primary or secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), volatile organic compounds (VOC), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb) are primary air pollutants. Of these, CO, SO_2, NO_2, PM_{10}, and $PM_{2.5}$ are "criteria air pollutants," which means that ambient air quality standards (AAQS) have been established for them. VOC and oxides of nitrogen (NO_x) are air pollutant precursors that form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O_3) and NO_2 are the principal secondary pollutants. A description of each of the primary and secondary criteria air pollutants and their known health effects is presented below.

Carbon Monoxide (CO) is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. CO is a primary criteria air pollutant. CO concentrations tend to be the highest during winter mornings with little to no wind, when surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion, engines and motor vehicles operating at slow speeds are the primary source of CO in the SoCAB. The highest ambient CO concentrations are generally found near traffic-congested corridors and intersections. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation (SCAQMD 2005; USEPA 2018a). The SoCAB is designated under the California and National AAQS as being in attainment of CO criteria levels (CARB 2017a).

Volatile Organic Compounds (VOC) are compounds composed primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of VOCs include evaporative emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. There are no ambient air quality standards established for VOCs. However, because they contribute to the formation of ozone (O_3), SCAQMD has established a significance threshold for this pollutant (SCAQMD 2005).

Nitrogen Oxides (NO_x) are a byproduct of fuel combustion and contribute to the formation of O_3, PM_{10}, and $PM_{2.5}$. The two major forms of NO_x are nitric oxide (NO) and nitrogen dioxide (NO_2). The principal form of NO_2 produced by combustion is NO, but NO reacts with oxygen to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in children (two and three years old) has also been observed at concentrations below 0.3 part per million (ppm).

NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure (SCAQMD 2005; USEPA 2018a). The SoCAB is designated as an attainment area for NO_2 under the National AAQS California AAQS (CARB 2017a).

Sulfur Dioxide (SO_2) is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. It enters the atmosphere as a result of burning high-sulfur-content fuel oils and coal and from chemical processes at chemical plants and refineries. Gasoline and natural gas have very low sulfur content and do not release significant quantities of SO_2 (SCAQMD 2005; USEPA 2018a). When sulfur dioxide forms sulfates (SO_4) in the atmosphere, together these pollutants are referred to as sulfur oxides (SO_X). Thus, SO_2 is both a primary and secondary criteria air pollutant. At sufficiently high concentrations, SO_2 may irritate the upper respiratory tract. At lower concentrations and when combined with particulates, SO_2 may do greater harm by injuring lung tissue. The SoCAB is designated as attainment under the California and National AAQS (CARB 2017a).

Suspended Particulate Matter (PM_{10} and $PM_{2.5}$) consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now recognized and regulated. Inhalable coarse particles, or PM_{10}, include the particulate matter with an aerodynamic diameter of 10 microns (i.e., 10 millionths of a meter or 0.0004 inch) or less. Inhalable fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 microns (i.e., 2.5 millionths of a meter or 0.0001 inch) or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind action on arid landscapes also contributes substantially to local particulate loading (i.e., fugitive dust). Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in people who are naturally sensitive or susceptible to breathing problems (SCAQMD 2005).

The US Environmental Protection Agency's (EPA) scientific review concluded that $PM_{2.5}$, which penetrates deeply into the lungs, is more likely than PM_{10} to contribute to health effects and at concentrations that extend well below those allowed by the current PM_{10} standards. These health effects include premature death and increased hospital admissions and emergency room visits (primarily the elderly and individuals with cardiopulmonary disease); increased respiratory symptoms and disease (children and individuals with cardiopulmonary disease such as asthma); decreased lung functions (particularly in children and individuals with asthma); and alterations in lung tissue and structure and in respiratory tract defense mechanisms (SCAQMD 2005). There has been emerging evidence that even smaller particulates with an aerodynamic diameter of <0.1 microns or less (i.e., ≤0.1 millionths of a meter or <0.000004 inch), known as ultrafine particulates (UFPs), have human health implications, because UFPs toxic components may initiate or facilitate biological processes that may lead to adverse effects to the heart, lungs, and other organs (SCAQMD 2016). However, the EPA or CARB have yet to adopt AAQS to regulate these particulates. Diesel particulate matter (DPM) is classified by the CARB as a carcinogen (CARB 1998). Particulate matter can also cause environmental effects such as visibility impairment,[1] environmental damage,[2] and aesthetic damage[3]

[1] $PM_{2.5}$ is the main cause of reduced visibility (haze) in parts of the United States.
[2] Particulate matter can be carried over long distances by wind and then settle on ground or water, making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems.

(SCAQMD 2005; USEPA 2018a). The SoCAB is a nonattainment area for $PM_{2.5}$ under California and National AAQS and a nonattainment area for PM_{10} under the California AAQS (CARB 2017a).[4]

Ozone (O_3) is commonly referred to as "smog" and is a gas that is formed when VOCs and NO_x, both by-products of internal combustion engine exhaust, undergo photochemical reactions in the presence of sunlight. O_3 is a secondary criteria air pollutant. O_3 concentrations are generally highest during the summer months when direct sunlight, light winds, and warm temperatures create favorable conditions for the formation of this pollutant. O_3 poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Breathing O_3 can trigger a variety of health problems, including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level O_3 also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue. O_3 also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. In particular, O_3 harms sensitive vegetation during the growing season (SCAQMD 2005; USEPA 2018a). The SoCAB is designated as extreme nonattainment under the California AAQS (1-hour and 8-hour) and National AAQS (8-hour) (CARB 2017a).

Lead (Pb) is a metal found naturally in the environment as well as in manufactured products. Once taken into the body, lead distributes throughout the body in the blood and accumulates in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen-carrying capacity of the blood. The effects of lead most commonly encountered in current populations are neurological effects in children and cardiovascular effects in adults (e.g., high blood pressure and heart disease). Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems, learning deficits, and lowered IQ (SCAQMD 2005; USEPA 2018a). The major sources of lead emissions have historically been mobile and industrial sources. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector dramatically declined by 95 percent between 1980 and 1999, and levels of lead in the air decreased by 94 percent between 1980 and 1999. Today, the highest levels of lead in air are usually found near lead smelters. The major sources of lead emissions today are ore and metals processing and piston-engine aircraft operating on leaded aviation gasoline. However, in 2008 the EPA and CARB adopted stricter lead standards, and special monitoring sites immediately downwind of lead sources recorded very localized violations of the new state and federal standards.[5] As a result of these violations, the Los Angeles County portion of the SoCAB is designated nonattainment under the National AAQS for lead (SCAQMD 2012; CARB 2017a). Because emissions of lead are found only in projects that are permitted by SCAQMD, lead is not a pollutant of concern for the project.

[3] Particulate matter can stain and damage stone and other materials, including culturally important objects such as statues and monuments.

[4] CARB approved the SCAQMD's request to redesignate the SoCAB from serious nonattainment for PM_{10} to attainment for PM_{10} under the National AAQS on March 25, 2010, because the SoCAB has not violated federal 24-hour PM_{10} standards during the period from 2004 to 2007. In June 2013, the EPA approved the State of California's request to redesignate the PM_{10} nonattainment area to attainment of the PM_{10} National AAQS, effective on July 26, 2013.

[5] Source-oriented monitors record concentrations of lead at lead-related industrial facilities in the SoCAB, which include Exide Technologies in the City of Commerce; Quemetco, Inc., in the City of Industry; Trojan Battery Company in Santa Fe Springs; and Exide Technologies in Vernon. Monitoring conducted between 2004 through 2007 showed that the Trojan Battery Company and Exide Technologies exceed the federal standards (SCAQMD 2012).

TOXIC AIR CONTAMINANTS

The public's exposure to air pollutants classified as toxic air contaminants (TACs) is a significant environmental health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The California Health and Safety Code defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant (HAP) pursuant to Section 112(b) of the federal Clean Air Act (42 United States Code §7412[b]) is a toxic air contaminant. Under state law, the California Environmental Protection Agency (Cal/EPA), acting through CARB, is authorized to identify a substance as a TAC if it determines that the substance is an air pollutant that may cause or contribute to an increase in mortality or to an increase in serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through Assembly Bill (AB) 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an "airborne toxics control measure" for sources that emit designated TACs. If there is a safe threshold for a substance (i.e., a point below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to minimize emissions. To date, CARB has established formal control measures for 11 TACs, all of which are identified as having no safe threshold.

Air toxics from stationary sources are also regulated in California under the Air Toxics "Hot Spot" Information and Assessment Act of 1987. Under AB 2588, toxic air contaminant emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High priority facilities are required to perform a health risk assessment and, if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

By the last update to the TAC list in December 1999, CARB had designated 244 compounds as TACs (CARB 1999). Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines.

Diesel Particulate Matter

In 1998, CARB identified particulate emissions from diesel-fueled engines (diesel PM) as a TAC. Previously, the individual chemical compounds in diesel exhaust were considered TACs. Almost all diesel exhaust particle mass is 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

CARB has promulgated the following specific rules to limit TAC emissions:

- 13 CCR Chapter 10, Section 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

- 13 CCR Chapter 10, Section 2480, Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools

- 13 CCR Section 2477 and Article 8, Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets and Facilities Where TRUs Operate

Community Risk

In addition, to reduce exposure to TACs, CARB developed and approved the *Air Quality and Land Use Handbook: A Community Health Perspective* (2005) to provide guidance regarding the siting of sensitive land uses in the vicinity of freeways, distribution centers, rail yards, ports, refineries, chrome-plating facilities, dry cleaners, and gasoline-dispensing facilities. This guidance document was developed to assess compatibility and associated health risks when placing sensitive receptors near existing pollution sources. CARB's recommendations on the siting of new sensitive land uses were based on a compilation of recent studies that evaluated data on the adverse health effects from proximity to air pollution sources. The key observation in these studies is that proximity to air pollution sources substantially increases exposure and the potential for adverse health effects. There are three carcinogenic toxic air contaminants that constitute the majority of the known health risks from motor vehicle traffic, DPM from trucks, and benzene and 1,3 butadiene from passenger vehicles. CARB recommendations are based on data that show that localized air pollution exposures can be reduced by as much as 80 percent by following CARB minimum distance separations.

Multiple Airborne Toxics Exposure Study (MATES)

The Multiple Air Toxics Exposure Study (MATES) is a monitoring and evaluation study on ambient concentrations of TACs and estimated the potential health risks from air toxics in the SoCAB. In 2008, SCAQMD conducted its third update to the MATES study (MATES III). The results showed that the overall risk for excess cancer from a lifetime exposure to ambient levels of air toxics was about 1,200 in a million. The largest contributor to this risk was diesel exhaust, accounting for 84 percent of the cancer risk (SCAQMD 2008a).

SCAQMD recently released the fourth update (MATES IV). The results showed that the overall monitored risk for excess cancer from a lifetime exposure to ambient levels of air toxics decreased to approximately 418 in one million. Compared to the 2008 MATES III, monitored excess cancer risks decreased by approximately 65 percent. Approximately 90 percent of the risk is attributed to mobile sources while 10 percent is attributed to TACs from stationary sources, such as refineries, metal processing facilities, gas stations, and chrome plating facilities. The largest contributor to this risk was diesel exhaust, accounting for approximately 68 percent of the air toxics risk. Compared to MATES III, MATES IV found substantial improvement in air quality and associated decrease in air toxics exposure. As a result, the estimated basin-wide population-weighted risk decreased by approximately 57 percent compared to the analysis done for the MATES III time period (SCAQMD 2015a).

The Office of Environmental Health Hazard Assessment (OEHHA) updated the guidelines for estimating cancer risks on March 6, 2015. The new method utilizes higher estimates of cancer potency during early life exposures, which result in a higher calculation of risk. There are also differences in the assumptions on

breathing rates and length of residential exposures. When combined together, SCAQMD estimates that risks for a given inhalation exposure level will be about 2.7 times higher using the proposed updated methods identified in MATES IV (e.g., 2.7 times higher than 418 in one million overall excess cancer risk) (SCAQMD 2015a).

Air Quality Management Planning

SCAQMD is the agency responsible for preparing the air quality management plan (AQMP) for the SoCAB in coordination with the Southern California Association of Governments (SCAG). Since 1979, a number of AQMPs have been prepared.

2016 AQMP

On March 3, 2017, SCAQMD adopted the 2016 AQMP as an update to the 2012 AQMP. The 2016 AQMP addresses strategies and measures to attain the following National AAQS:

- 2008 National 8-hour ozone standard by 2031,
- 2012 National annual $PM_{2.5}$ standard by 2025[6],
- 2006 National 24-hour $PM_{2.5}$ standard by 2019,
- 1997 National 8-hour ozone standard by 2023, and the
- 1979 National 1-hour ozone standard by year 2022.

It is projected that total NO_X emissions in the SoCAB would need to be reduced to 150 tons per day (tpd) by year 2023 and to 100 tpd in year 2031 to meet the 1997 and 2008 federal 8-hour ozone standards. The strategy to meet the 1997 federal 8-hour ozone standard would also lead to attaining the 1979 federal 1-hour ozone standard by year 2022 (SCAQMD 2017), which requires reducing NO_X emissions in the SoCAB to 250 tpd. This is approximately 45 percent additional reductions above existing regulations for the 2023 ozone standard and 55 percent additional reductions above existing regulations to meet the 2031 ozone standard.

Reducing NO_X emissions would also reduce $PM_{2.5}$ concentrations in the SoCAB. However, as the goal is to meet the 2012 federal annual $PM_{2.5}$ standard no later than year 2025, SCAQMD is seeking to reclassify the SoCAB from "moderate" to "serious" nonattainment under this federal standard. A "moderate" non-attainment would require meeting the 2012 federal standard by no later than 2021.

Overall, the 2016 AQMP is composed of stationary and mobile-source emission reductions from regulatory control measures, incentive-based programs, co-benefits from climate programs, mobile-source strategies, and reductions from federal sources such as aircrafts, locomotives, and ocean-going vessels. Strategies outlined in the 2016 AQMP would be implemented in collaboration between CARB and the EPA (SCAQMD 2017).

LEAD STATE IMPLEMENTATION PLAN

In 2008 EPA designated the Los Angeles County portion of the SoCAB nonattainment under the federal lead (Pb) classification due to the addition of source-specific monitoring under the new federal regulation.

[6] The 2016 AQMP requests a reclassification from moderate to serious non-attainment for the 2012 National $PM_{2.5}$ standard.

This designation was based on two source-specific monitors in Vernon and the City of Industry exceeding the new standard. The rest of the SoCAB, outside the Los Angeles County nonattainment area remains in attainment of the new standard. On May 24, 2012, CARB approved the SIP revision for the federal lead standard, which the EPA revised in 2008. Lead concentrations in this nonattainment area have been below the level of the federal standard since December 2011. The SIP revision was submitted to EPA for approval.

AREA DESIGNATIONS

The AQMP provides the framework for air quality basins to achieve attainment of the state and federal ambient air quality standards through the State Implementation Plan (SIP). Areas are classified as attainment or nonattainment areas for particular pollutants, depending on whether they meet ambient air quality standards. Severity classifications for ozone nonattainment range in magnitude from marginal, moderate, and serious to severe and extreme.

- **Unclassified:** a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.

- **Attainment:** a pollutant is in attainment if the CAAQS for that pollutant was not violated at any site in the area during a three-year period.

- **Nonattainment:** a pollutant is in nonattainment if there was at least one violation of a state AAQS for that pollutant in the area.

- **Nonattainment/Transitional:** a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the AAQS for that pollutant.

The attainment status for the SoCAB is shown in Table 2, *Attainment Status of Criteria Pollutants in the South Coast Air Basin*. The SoCAB is designated in attainment of the California AAQS for sulfates. The SoCAB is designated as nonattainment for lead (Los Angeles County only) under the National AAQS.

Table 2 Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
Ozone – 1-hour	Extreme Nonattainment	No Federal Standard
Ozone – 8-hour	Extreme Nonattainment	Extreme Nonattainment
PM_{10}	Serious Nonattainment	Attainment/Maintenance
$PM_{2.5}$	Nonattainment	Nonattainment[1]
CO	Attainment	Attainment
NO_2	Attainment	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Attainment	Nonattainment (Los Angeles County only)[2]
All others	Attainment/Unclassified	Attainment/Unclassified

Source: CARB 2017a.

[1] SCAQMD is seeking to reclassify the SoCAB from "moderate" to "serious" nonattainment under federal $PM_{2.5}$ standard.

[2] In 2010, the Los Angeles portion of the SoCAB was designated nonattainment for lead under the new federal and existing state AAQS as a result of large industrial emitters. Remaining areas in the SoCAB are unclassified.

Existing Ambient Air Quality

Existing levels of ambient air quality and historical trends and projections in the vicinity of the project site are best documented by measurements taken by the SCAQMD. The project site is in Source Receptor Area (SRA) 16 – North Orange County. The air quality monitoring station closest to the project site is the La Habra Monitoring Station. This station monitors O_3, CO, and NO_2. Data for SO_2 is supplemented by the Costa Mesa-Mesa Verde Drive Monitoring Station and PM_{10} and $PM_{2.5}$ is supplemented by the Azusa Monitoring Station. The most current five years of data monitored at these monitoring stations are included in Table 3, *Ambient Air Quality Monitoring Summary*. The data show recurring violations of both the state and federal O_3 standards. The data also indicates that the area consistently exceeds the state PM_{10} standards and federal $PM_{2.5}$ standard. The lack of data provided for both CO and SO_2 does not allow for threshold exceedance conclusions to be made.

Table 3 Ambient Air Quality Monitoring Summary

Pollutant/Standard	Number of Days Threshold Were Exceeded and Maximum Levels during Such Violations				
	2013	2014	2015	2016	2017
Ozone (O_3) [1]					
State 1-Hour ≥ 0.09 ppm (days exceed threshold)	2	5	4	3	5
State 8-hour ≥ 0.07 ppm (days exceed threshold)	2	6	8	7	12
Federal 8-Hour > 0.075 ppm (days exceed threshold)	1	2	2	3	8
Max. 1-Hour Conc. (ppm)	0.104	0.109	0.103	0.103	0.113
Max. 8-Hour Conc. (ppm)	0.078	0.089	0.082	0.079	0.087
Carbon Monoxide (CO) [1]					
State 8-Hour > 9.0 ppm (days exceed threshold)	*	*	*	*	*
Federal 8-Hour ≥ 9.0 ppm (days exceed threshold)	*	*	*	*	*
Max. 8-Hour Conc. (ppm)	*	*	*	*	*
Nitrogen Dioxide (NO_2) [1]					
State 1-Hour ≥ 0.18 ppm (days exceed threshold)	0	0	0	0	0
Federal 1-Hour ≥ 0.100 ppm (days exceed threshold)	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.085	0.084	0.058	0.060	0.076
Sulfur Dioxide (SO_2) [2]					
State 24-Hour ≥ 0.04 ppm (days exceed threshold)	*	*	*	*	*
Federal 24-Hour ≥ 0.14 ppm (days exceed threshold)	*	*	*	*	*
Max 24-Hour Conc. (ppm)	0.001	*	*	*	*
Coarse Particulates (PM_{10}) [3]					
State 24-Hour > 50 µg/m³ (days exceed threshold)	1	12	12.1	*	*
Federal 24-Hour > 150 µg/m³ (days exceed threshold)	0	0	0	0	0
Max. 24-Hour Conc. (µg/m³)	77	84	59	*	*
Fine Particulates ($PM_{2.5}$) [3]					
Federal 24-Hour > 35 µg/m³ (days exceed threshold)	1	4	3	1	7
Max. 24-Hour Conc. (µg/m³)	47.7	46.5	53.8	45.5	56.2

Source: CARB 2018a.
ppm: parts per million; parts per billion, µg/m³: micrograms per cubic meter
Notes: * Data not available.
[1] Data obtained from the Orange – La Habra Station.
[2] Data obtained from the Orange – Costa Mesa-Mesa Verde Drive Station.
[3] Data obtained from the Orange – Anaheim-Pampas Lane Station.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Schools are also considered sensitive receptors, as children are present for extended durations and engage in regular outdoor activities. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory

functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public. The nearest sensitive receptor to the proposed project site is the residential Imperial Park Apartments II approximately 715 feet to the south of the project site.

Methodology

Projected construction-related air pollutant emissions are calculated using the California Emissions Estimator Model (CalEEMod), Version 2016.3.2. CalEEMod compiles an emissions inventory of construction (fugitive dust, off-gas emissions, on-road emissions, and off-road emissions), area sources, indirect emissions from energy use, mobile sources, indirect emissions from waste disposal (annual only), and indirect emissions from water/wastewater (annual only) use. The calculated emissions of the project are compared to thresholds of significance for individual projects using the SCAQMD's CEQA Air Quality Analysis Guidance Handbook.

Thresholds of Significance

The analysis of the proposed project's air quality impacts follows the guidance and methodologies recommended in SCAQMD's *CEQA Air Quality Handbook* and the significance thresholds on SCAQMD's website (SCAQMD 1993).[7] CEQA allows the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. SCAQMD has established thresholds of significance for regional air quality emissions for construction activities and project operation. In addition to the daily thresholds listed above, projects are also subject to the AAQS. These are addressed though an analysis of localized CO impacts and localized significance thresholds (LSTs).

REGIONAL SIGNIFICANCE THRESHOLDS

SCAQMD has adopted regional construction and operational emissions thresholds to determine a project's cumulative impact on air quality in the SoCAB. Table 4, *SCAQMD Significance Thresholds*, lists SCAQMD's regional significance thresholds that are applicable for all projects uniformly regardless of size or scope. There is growing evidence that although ultrafine particulates contribute a very small portion of the overall atmospheric mass concentration, they represent a greater proportion of the health risk from PM. However, the EPA or CARB have not yet adopted AAQS to regulate ultrafine particulates; therefore, SCAQMD has not developed thresholds for them.

[7] SCAQMD's Air Quality Significance Thresholds are current as of March 2015 and can be found here: http://www.aqmd.gov/ceqa/hdbk.html.

Table 4 SCAQMD Significance Thresholds

Air Pollutant	Construction Phase	Operational Phase
Reactive Organic Gases (ROGs)/ Volatile Organic Compounds (VOCs)	75 lbs/day	55 lbs/day
Nitrogen Oxides (NO_X)	100 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Sulfur Oxides (SO_X)	150 lbs/day	150 lbs/day
Particulates (PM_{10})	150 lbs/day	150 lbs/day
Particulates ($PM_{2.5}$)	55 lbs/day	55 lbs/day

Source: SCAQMD 2015b.

Projects that exceed the regional significance threshold contribute to the nonattainment designation of the SoCAB. The attainment designations are based on the AAQS, which are set at levels of exposure that are determined to not result in adverse health. Exposure to fine particulate pollution and ozone causes myriad health impacts, particularly to the respiratory and cardiovascular systems:

- Linked to increased cancer risk ($PM_{2.5}$, TACs)
- Aggravates respiratory disease (O_3, $PM_{2.5}$)
- Increases bronchitis (O_3, $PM_{2.5}$)
- Causes chest discomfort, throat irritation, and increased effort to take a deep breath (O_3)
- Reduces resistance to infections and increases fatigue (O_3)
- Reduces lung growth in children ($PM_{2.5}$)
- Contributes to heart disease and heart attacks ($PM_{2.5}$)
- Contributes to premature death (O_3, $PM_{2.5}$)
- Linked to lower birth weight in newborns ($PM_{2.5}$) (SCAQMD 2015c)

Exposure to fine particulates and ozone aggravates asthma attacks and can amplify other lung ailments such as emphysema and chronic obstructive pulmonary disease. Exposure to current levels of $PM_{2.5}$ is responsible for an estimated 4,300 cardiopulmonary-related deaths per year in the SoCAB. In addition, University of Southern California scientists responsible for a landmark children's health study found that lung growth improved as air pollution declined for children aged 11 to 15 in five communities in the SoCAB (SCAQMD 2015d).

Mass emissions in Table 4 are not correlated with concentrations of air pollutants but contribute to the cumulative air quality impacts in the SoCAB. Therefore, regional emissions from a single project do not single-handedly trigger a regional health impact. SCAQMD is the primary agency responsible for ensuring the health and welfare of sensitive individuals to elevated concentrations of air quality in the SoCAB. To achieve the health-based standards established by the EPA, SCAQMD prepares an AQMP that details regional programs to attain the AAQS.

CO HOTSPOTS

Areas of vehicle congestion have the potential to create pockets of CO called hot spots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hot spots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduced speeds. With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the SoCAB and in the state have steadily declined.

In 2007, the SoCAB was designated in attainment for CO under both the California AAQS and National AAQS. The CO hot spot analysis conducted for the attainment by SCAQMD for busiest intersections in Los Angeles during the peak morning and afternoon periods plan did not predict a violation of CO standards. [8] As identified in SCAQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan), peak carbon monoxide concentrations in the SoCAB in previous years, prior to redesignation, were a result of unusual meteorological and topographical conditions and not a result of congestion at a particular intersection. Under existing and future vehicle emission rates, a project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact (BAAQMD 2017).

LOCALIZED SIGNIFICANCE THRESHOLDS

SCAQMD developed LSTs for emissions of NO_2, CO, PM_{10}, and $PM_{2.5}$ generated at the project site (offsite mobile-source emissions are not included in the LST analysis). LSTs represent the maximum emissions at a project site that are not expected to cause or contribute to an exceedance of the most stringent federal or state AAQS and are shown in Table 5, *SCAQMD Localized Significance Thresholds*.

Table 5 SCAQMD Localized Significance Thresholds

Air Pollutant (Relevant AAQS)	Concentration
1-Hour CO Standard (CAAQS)	20 ppm
8-Hour CO Standard (CAAQS)	9.0 ppm
1-Hour NO_2 Standard (CAAQS)	0.18 ppm
Annual NO_2 Standard (CAAQS)	0.03 ppm
24-Hour PM_{10} Standard – Construction (SCAQMD)[1]	10.4 µg/m^3
24-Hour $PM_{2.5}$ Standard – Construction (SCAQMD)[1]	10.4 µg/m^3
24-Hour PM_{10} Standard – Operation (SCAQMD)[1]	2.5 µg/m^3
24-Hour $PM_{2.5}$ Standard – Operation (SCAQMD)[1]	2.5 µg/m^3

Source: SCAQMD 2015b.

ppm – parts per million; µg/m^3 – micrograms per cubic meter

[1] Threshold is based on SCAQMD Rule 403. Since the SoCAB is in nonattainment for PM_{10} and $PM_{2.5}$, the threshold is established as an allowable change in concentration. Therefore, background concentration is irrelevant.

[8] The four intersections were: Long Beach Boulevard and Imperial Highway; Wilshire Boulevard and Veteran Avenue; Sunset Boulevard and Highland Avenue; and La Cienega Boulevard and Century Boulevard. The busiest intersection evaluated (Wilshire and Veteran) had a daily traffic volume of approximately 100,000 vehicles per day with LOS E in the morning peak hour and LOS F in the evening peak hour.

To assist lead agencies, SCAQMD developed screening-level LSTs to back-calculate the mass amount (lbs. per day) of emissions generated onsite that would trigger the levels shown in Table 5 for projects under 5-acres. These "screening-level" LSTs tables are the localized significance thresholds for all projects of five acres and less; however, it can be used as screening criteria for larger projects to determine whether or not dispersion modeling may be required to compare concentrations of air pollutants generated by the project to the localized concentrations shown in Table 5.

In accordance with SCAQMD's LST methodology, the screening-level construction LSTs are based on the acreage disturbed per day based on equipment use. The screening-level construction LSTs for the project site in SRA 16 are shown in Table 6, *SCAQMD Screening-Level Construction Localized Significance Thresholds*.

Table 6 SCAQMD Screening-Level Construction Localized Significance Thresholds

	Threshold (lbs/day)			
Acreage Disturbed	Nitrogen Oxides (NO_X)[1]	Carbon Monoxide (CO)[1]	Coarse Particulates (PM_{10})[2]	Fine Particulates ($PM_{2.5}$)[2]
1.01 Acres Disturbed Per Day	103	524	58	23

Source: SCAQMD 2008b; SCAQMD 2011, Based on receptors in SRA 16.
[1] LSTs are based on non-sensitive receptors within 82 feet (25 meters).
[2] LSTs are based on sensitive receptors within 715 feet (218 meters).

The screening-level operational LSTs in SRA 16 are shown in Table 7, *SCAQMD Screening-Level Operational Localized Significance Thresholds*.

Table 7 SCAQMD Screening-Level Operational Localized Significance Thresholds

Air Pollutant	Threshold (lbs/day) 1.01-Acre Operational LSTs
Nitrogen Oxides (NO_X)[1]	103
Carbon Monoxide (CO)[1]	524
Coarse Particulates (PM_{10})[2]	14
Fine Particulates ($PM_{2.5}$)[2]	6

Source: SCAQMD 2008b, Based on receptors in SRA 16.
[1] LSTs are based on non-sensitive receptors within 82 feet (25 meters).
[2] LSTs are based on sensitive receptors within 715 feet (218 meters).

GREENHOUSE GAS EMISSIONS

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHG, to the atmosphere. Climate change is the variation of Earth's climate over time, whether due to natural variability or as a result of human activities. The primary source of these GHG is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has

identified four major GHG—water vapor,[9] carbon (CO_2), methane (CH_4), and ozone (O_3)—that are the likely cause of an increase in global average temperatures observed within the 20th and 21st centuries. Other GHG identified by the IPCC that contribute to global warming to a lesser extent include nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons (IPCC 2001).[10] The major GHG are briefly described below.

- **Carbon dioxide (CO_2)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g. manufacture of cement). Carbon dioxide is removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.

- **Methane (CH_4)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal landfills and water treatment facilities.

- **Nitrous oxide (N_2O)** is emitted during agricultural and industrial activities as well as during combustion of fossil fuels and solid waste.

- **Fluorinated gases** are synthetic, strong GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as high global-warming-potential (GWP) gases.

    - *Chlorofluorocarbons (CFCs*) are GHGs covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere (troposphere, stratosphere), CFCs drift into the upper atmosphere where, given suitable conditions, they break down ozone. These gases are also ozone-depleting gases and are therefore being replaced by other compounds that are GHGs covered under the Kyoto Protocol.

    - *Perfluorocarbons (PFCs)* are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF_4] and perfluoroethane [C_2F_6]) were introduced as alternatives, along with HFCs, to the ozone-depleting substances. In addition, PFCs are emitted as by-products of industrial processes and are used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they have a high global warming potential.

[9] Water vapor (H_2O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant, but part of the feedback loop o rather than a primary cause of change.

[10] Black carbon contributes to climate change both directly, by absorbing sunlight, and indirectly, by depositing on snow (making it melt faster) and by interacting with clouds and affecting cloud formation. Black carbon is the most strongly light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Reducing black carbon emissions globally can have immediate economic, climate, and public health benefits. California has been an international leader in reducing emissions of black carbon, with close to 95 percent control expected by 2020 due to existing programs that target reducing PM from diesel engines and burning activities (CARB 2017b). However, state and national GHG inventories do not yet include black carbon due to ongoing work resolving the precise global warming potential of black carbon. Guidance for CEQA documents does not yet include black carbon.

- ***Sulfur Hexafluoride (SF_6)*** is a colorless gas soluble in alcohol and ether, slightly soluble in water. SF_6 is a strong GHG used primarily in electrical transmission and distribution systems as an insulator.

- ***Hydrochlorofluorocarbons (HCFCs)*** contain hydrogen, fluorine, chlorine, and carbon atoms. Although ozone-depleting substances, they are less potent at destroying stratospheric ozone than CFCs. They have been introduced as temporary replacements for CFCs and are also GHGs.

- ***Hydrofluorocarbons (HFCs)*** contain only hydrogen, fluorine, and carbon atoms. They were introduced as alternatives to ozone-depleting substances to serve many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are strong GHGs (IPCC 2001; USEPA 2018b).

GHGs are dependent on the lifetime or persistence of the gas molecule in the atmosphere. Some GHGs have stronger greenhouse effects than others. These are referred to as high GWP gases. The GWP of GHG emissions are shown in Table 9, *GHG Emissions and Their Relative Global Warming Potential Compared to CO_2*. The GWP is used to convert GHGs to CO_2-equivalence (CO_2e) to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. For example, under IPCC's Fourth Assessment Report (AR4) GWP values for CH_4, a project that generates 10 metric tons (MT) of CH_4 would be equivalent to 250 MT of CO_2.[11]

Table 9 GHG Emissions and Their Relative Global Warming Potential Compared to CO_2

GHGs	Second Assessment Report Atmospheric Lifetime (Years)	Fourth Assessment Report Atmospheric Lifetime (Years)	Second Assessment Report Global Warming Potential Relative to CO_2[1]	Fourth Assessment Report Global Warming Potential Relative to CO_2[1]
Carbon Dioxide (CO_2)	50 to 200	50 to 200	1	1
Methane[2] (CH_4)	12 (±3)	12	21	25
Nitrous Oxide (N_2O)	120	114	310	298
Hydrofluorocarbons:				
HFC-23	264	270	11,700	14,800
HFC-32	5.6	4.9	650	675
HFC-125	32.6	29	2,800	3,500
HFC-134a	14.6	14	1,300	1,430
HFC-143a	48.3	52	3,800	4,470
HFC-152a	1.5	1.4	140	124
HFC-227ea	36.5	34.2	2,900	3,220
HFC-236fa	209	240	6,300	9,810
HFC-4310mee	17.1	15.9	1,300	1,030
Perfluoromethane: CF_4	50,000	50,000	6,500	7,390
Perfluoroethane: C_2F_6	10,000	10,000	9,200	12,200
Perfluorobutane: C_4F_{10}	2,600	NA	7,000	8,860
Perfluoro-2-	3,200	NA	7,400	9,300

Table 9 GHG Emissions and Their Relative Global Warming Potential Compared to CO_2

GHGs	Second Assessment Report Atmospheric Lifetime (Years)	Fourth Assessment Report Atmospheric Lifetime (Years)	Second Assessment Report Global Warming Potential Relative to CO_2[1]	Fourth Assessment Report Global Warming Potential Relative to CO_2[1]
methylpentane: C_6F_{14}				
Sulfur Hexafluoride (SF_6)	3,200	NA	23,900	22,800

Source: IPCC 1995; IPCC 2007.

Notes: The GWP values in the IPCC's Fifth Assessment Report (2013) reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO_2. However, SCAQMD uses the AR4 GWP values to maintain consistency in statewide GHG emissions modeling. In addition, the 2017 Scoping Plan Update was based on the AR4 GWP values.

[1] Based on 100-year time horizon of the GWP of the air pollutant relative to CO_2.

[2] The methane GWP includes direct effects and indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

Regulatory Settings

REGULATION OF GHG EMISSIONS ON A NATIONAL LEVEL

The U.S. Environmental Protection Agency (EPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat. The EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements, but allow the EPA to finalize the GHG standards proposed in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation (USEPA 2009).

To regulate GHGs from passenger vehicles, EPA was required to issue an endangerment finding. The finding identifies emissions of six key GHGs—CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6—that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world. The first three are applicable to the project's GHG emissions inventory because they constitute the majority of GHG emissions and, per South Coast Air Quality Management District guidance, are the GHG emissions that should be evaluated as part of a project's GHG emissions inventory.

US Mandatory Report Rule for GHGs (2009)

In response to the endangerment finding, the EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (large stationary sources, etc.) to report GHG emissions data. Facilities that emit 25,000 MT or more of CO_2 per year are required to submit an annual report.

Update to Corporate Average Fuel Economy Standards (2010/2012)

The current Corporate Average Fuel Economy standards (for model years 2011 to 2016) incorporate stricter fuel economy requirements promulgated by the federal government and California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25 percent by 2016 (resulting in a fleet average of 35.5 miles per gallon by 2016). Rulemaking to adopt these new standards was completed in 2010. California agreed to allow automakers who show compliance with the

national program to also be deemed in compliance with state requirements. The federal government issued new standards in 2012 for model years 2017–2025 that will require a fleet average of 54.5 miles per gallon in 2025. However, the EPA is reexamining the 2017-2025 emissions standards.

EPA Regulation of Stationary Sources under the Clean Air Act (Ongoing)

Pursuant to its authority under the Clean Air Act, the EPA has been developing regulations for new stationary sources such as power plants, refineries, and other large sources of emissions. Pursuant to former President Obama's 2013 Climate Action Plan, the EPA was directed to develop regulations for existing stationary sources also. However, the EPA is reviewing the Clean Power Plan under President Trump's Energy Independence Executive Order.

REGULATION OF GHG EMISSIONS ON A STATE LEVEL

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in Executive Order S-3-05, Executive Order B-30-15, Assembly Bill 32 (AB 32), Senate Bill 32 (SB 32) and Senate Bill 375 (SB 375).

Executive Order S-3-05

Executive Order S-3-05, signed June 1, 2005. Executive Order S-3-05 set the following GHG reduction targets for the State:

- 2000 levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050

Assembly Bill 32, the Global Warming Solutions Act (2006)

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in AB 32. AB 32 was passed by the California state legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG emissions. AB 32 follows the 2020 tier of emissions reduction targets established in Executive Order S-03-05.

CARB 2008 Scoping Plan

The final Scoping Plan was adopted by CARB on December 11, 2008. The *2008 Scoping Plan* identified that GHG emissions in California are anticipated to be approximately 596 $MMTCO_2e$ in 2020. In December 2007, CARB approved a 2020 emissions limit of 427 $MMTCO_2e$ (471 million tons) for the state (CARB 2008). In order to effectively implement the emissions cap, AB 32 directed CARB to establish a mandatory reporting system to track and monitor GHG emissions levels for large stationary sources that generate more than 25,000 $MTCO_2e$ per year, prepare a plan demonstrating how the 2020 deadline can be met, and develop appropriate regulations and programs to implement the plan by 2012.

First Update to the Scoping Plan

CARB completed a five-year update to the 2008 Scoping Plan, as required by AB 32. The First Update to the Scoping Plan was adopted at the May 22, 2014, board hearing. The update highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the original 2008 Scoping Plan. As part of the update, CARB recalculated the 1990 GHG emission levels with the updated AR4 GWPs, and the 427 $MMTCO_2e$ 1990 emissions level and 2020 GHG emissions limit, established in response to AB 32, is slightly higher at 431 $MMTCO_2e$ (CARB 2014).

As identified in the Update to the Scoping Plan, California is on track to meeting the goals of AB 32. However, the update also addresses the state's longer-term GHG goals within a post-2020 element. The post-2020 element provides a high level view of a long-term strategy for meeting the 2050 GHG goals, including a recommendation for the state to adopt a midterm target. According to the Update to the Scoping Plan, local government reduction targets should chart a reduction trajectory that is consistent with or exceeds the trajectory created by statewide goals (CARB 2014). CARB identified that reducing emissions to 80 percent below 1990 levels will require a fundamental shift to efficient, clean energy in every sector of the economy. Progressing toward California's 2050 climate targets will require significant acceleration of GHG reduction rates. Emissions from 2020 to 2050 will have to decline several times faster than the rate needed to reach the 2020 emissions limit (CARB 2014).

Executive Order B-30-15

Executive Order B-30-15, signed April 29, 2015, sets a goal of reducing GHG emissions in the state to 40 percent of 1990 levels by year 2030. Executive Order B-30-15 also directs CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and requires state agencies to implement measures to meet the interim 2030 goal as well as the long-term goal for 2050 in Executive Order S-03-05. It also requires the Natural Resources Agency to conduct triennial updates of the California adaption strategy, Safeguarding California, in order to ensure climate change is accounted for in state planning and investment decisions.

Senate Bill 32 and Assembly Bill 197

In September 2016, Governor Brown signed SB 32 and AB 197 into law, making the Executive Order goal for year 2030 into a statewide mandated legislative target. AB 197 established a joint legislative committee on climate change policies and requires the CARB to prioritize direction emissions reductions rather than the market-based cap-and-trade program for large stationary, mobile, and other sources.

2017 Climate Change Scoping Plan Update

Executive Order B-30-15 and SB 32 required CARB to prepare another update to the Scoping Plan to address the 2030 target for the state. On December 24, 2017, CARB adopted the 2017 Climate Change Scoping Plan Update, which outlines potential regulations and programs, including strategies consistent with AB 197 requirements, to achieve the 2030 target. The 2017 Scoping Plan establishes a new emissions limit of 260 $MMTCO_2e$ for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030 (CARB 2017c).

California's climate strategy will require contributions from all sectors of the economy, including enhanced focus on zero- and near-zero emission (ZE/NZE) vehicle technologies; continued investment in renewables, such as solar roofs, wind, and other types of distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning, to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for GHG reductions at stationary sources complement local air pollution control efforts by the local air districts to tighten criteria air pollutants and TACs emissions limits on a broad spectrum of industrial sources. Major elements of the 2017 Scoping Plan framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing ZEV buses and trucks;
- Low Carbon Fuel Standard (LCFS), with an increased stringency (18 percent by 2030).
- Implementation of SB 350, which expands the Renewables Portfolio Standard (RPS) to 50 percent RPS and doubles energy efficiency savings by 2030.
- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of ZEV trucks.
- Implementing the proposed Short-Lived Climate Pollutant Strategy (SLPS), which focuses on reducing methane and hydroflurocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030.
- Post-2020 Cap-and-Trade Program that includes declining caps.
- Continued implementation of SB 375.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

In addition to the statewide strategies listed above, the 2017 Climate Change Scoping Plan also identified local governments as essential partners in achieving the State's long-term GHG reduction goals and identified local actions to reduce GHG emissions. As part of the recommended actions, CARB recommends statewide targets of no more than 6 $MTCO_2e$ or less per capita by 2030 and 2 $MTCO_2e$ or less per capita by 2050. CARB recommends that local governments evaluate and adopt robust and quantitative locally-appropriate goals that align with the statewide per capita targets and the State's sustainable development objectives and develop plans to achieve the local goals. The statewide per capita goals were developed by applying the percent reductions necessary to reach the 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to the State's 1990 emissions limit established under AB 32. For CEQA projects, CARB states that lead agencies have discretion to develop evidenced-based numeric thresholds (mass emissions, per capita, or per service population)—consistent with the Scoping Plan and the state's long-term GHG goals. To the

degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from VMT, and direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits. Where further project design or regional investments are infeasible or not proven to be effective, CARB recommends mitigating potential GHG impacts through purchasing and retiring carbon credits.

The Scoping Plan scenario is set against what is called the business-as-usual (BAU) yardstick—that is, what would the GHG emissions look like if the State did nothing at all beyond the existing policies that are required and already in place to achieve the 2020 limit, as shown in Table 10, *2017 Climate Change Scoping Plan Emissions Reductions Gap*. It includes the existing renewables requirements, advanced clean cars, the "10 percent" Low Carbon Fuel Standard (LCFS), and the SB 375 program for more vibrant communities, among others. However, it does not include a range of new policies or measures that have been developed or put into statute over the past two years. Also shown in the table, the known commitments are expected to result in emissions that are 60 $MMTCO_2e$ above the target in 2030. If the estimated GHG reductions from the known commitments are not realized due to delays in implementation or technology deployment, the post-2020 Cap-and-Trade Program would deliver the additional GHG reductions in the sectors it covers to ensure the 2030 target is achieved.

Table 10 2017 Climate Change Scoping Plan Emissions Reductions Gap

Modeling Scenario	2030 GHG Emissions $MMTCO_2e$
Reference Scenario (Business-as-Usual)	389
With Known Commitments	320
2030 GHG Target	260
Gap to 2030 Target	60

Source: CARB 2017c.

Table 11, *2017 Climate Change Scoping Plan Emissions Change by Sector*, provides estimated GHG emissions by sector, compared to 1990 levels, and the range of GHG emissions for each sector estimated for 2030.

Table 11 2017 Climate Change Scoping Plan Emissions Change by Sector

Scoping Plan Sector	1990 $MMTCO_2e$	2030 Proposed Plan Ranges $MMTCO_2e$	% Change from 1990
Agricultural	26	24-25	-8% to -4%
Residential and Commercial	44	38-40	-14% to -9%
Electric Power	108	30-53	-72% to -51%
High GWP	3	8-11	267% to 367%
Industrial	98	83-90	-15% to -8%
Recycling and Waste	7	8-9	14% to 29%
Transportation (including TCU)	152	103-111	-32% to -27%
Net Sink[1]	-7	TBD	TBD
Sub Total	431	294-339	-32% to -21%
Cap-and-Trade Program	NA	24-79	NA

Table 11 2017 Climate Change Scoping Plan Emissions Change by Sector

Scoping Plan Sector	1990 $MMTCO_2e$	2030 Proposed Plan Ranges $MMTCO_2e$	% Change from 1990
Total	431	260	-40%

Source: CARB 2017c.
Notes: TCU = Transportation, Communications, and Utilities; TBD: To Be Determined.
[1] Work is underway through 2017 to estimate the range of potential sequestration benefits from the natural and working lands sector.

Senate Bill 1383

On September 19, 2016, the Governor signed SB 1383 to supplement the GHG reduction strategies in the Scoping Plan to consider short-lived climate pollutants, including black carbon and CH_4. Black carbon is the light-absorbing component of fine particulate matter produced during incomplete combustion of fuels. SB 1383 requires the state board, no later than January 1, 2018, to approve and begin implementing that comprehensive strategy to reduce emissions of short-lived climate pollutants to achieve a reduction in methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030, as specified. The bill also establishes targets for reducing organic waste in landfill. On March 14, 2017, CARB adopted the "Final Proposed Short-Lived Climate Pollutant Reduction Strategy," which identifies the state's approach to reducing anthropogenic and biogenic sources of short-lived climate pollutants. Anthropogenic sources of black carbon include on- and off-road transportation, residential wood burning, fuel combustion (charbroiling), and industrial processes. According to CARB, ambient levels of black carbon in California are 90 percent lower than in the early 1960s despite the tripling of diesel fuel use (CARB 2017b). In-use on-road rules are expected to reduce black carbon emissions from on-road sources by 80 percent between 2000 and 2020. SCAQMD is one of the air districts that requires air pollution control technologies for chain-driven broilers, which reduces particulate emissions from these char broilers by over 80 percent (CARB 2017b). Additionally, SCAQMD Rule 445 limits installation of new fireplaces in the SoCAB.

Senate Bill 375

In 2008, SB 375, the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the 2008 Scoping Plan for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 18 metropolitan planning organizations (MPOs). The Southern California Association of Governments (SCAG) is the MPO for the Southern California region, which includes the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial.

Pursuant to the recommendations of the Regional Transportation Advisory Committee, CARB adopted per capita reduction targets for each of the MPOs rather than a total magnitude reduction target. SCAG's targets are an 8 percent per capita reduction from 2005 GHG emission levels by 2020 and a 13 percent per capita reduction from 2005 GHG emission levels by 2035 (CARB 2010). The 2020 targets are smaller than the 2035

targets because a significant portion of the built environment in 2020 has been defined by decisions that have already been made. In general, the 2020 scenarios reflect that more time is needed for large land use and transportation infrastructure changes. Most of the reductions in the interim are anticipated to come from improving the efficiency of the region's transportation network. The targets would result in 3 $MMTCO_2e$ of reductions by 2020 and 15 $MMTCO_2e$ of reductions by 2035. Based on these reductions, the passenger vehicle target in CARB's Scoping Plan (for AB 32) would be met (CARB 2010).

2017 Update to the SB 375 Targets

CARB is required to update the targets for the MPOs every eight years. In June 2017, CARB released updated targets and technical methodology and recently released another update in February 2018. The updated targets consider the need to further reduce VMT, as identified in the 2017 Scoping Plan Update, while balancing the need for additional and more flexible revenue sources to incentivize positive planning and action toward sustainable communities. Like the 2010 targets, the updated SB 375 targets are in units of percent per capita reduction in GHG emissions from automobiles and light trucks relative to 2005. This excludes reductions anticipated from implementation of state technology and fuels strategies and any potential future state strategies such as statewide road user pricing. The proposed targets call for greater per capita GHG emission reductions from SB 375 than are currently in place, which for 2035, translate into proposed targets that either match or exceed the emission reduction levels in the MPOs' currently adopted SCSs. As proposed, CARB staff's proposed targets would result in an additional reduction of over 8 $MMTCO_2e$ in 2035 compared to the current targets. For the next round of SCS updates, CARB's updated targets for the SCAG region are an 8 percent per capita GHG reduction in 2020 from 2005 levels (unchanged from the 2010 target) and a 19 percent per capita GHG reduction in 2035 from 2005 levels (compared to the 2010 target of 13 percent) (CARB 2018b). CARB adopted the updated targets and methodology on March 22, 2018. All SCSs adopted after October 1, 2018 are subject to these new targets.

SCAG's 2016-2040 RTP/SCS

SB 375 requires each MPO to prepare an SCS in their regional transportation plan. For the SCAG region, the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) was adopted on April 7, 2016, and is an update to the 2012 RTP/SCS (SCAG 2016). In general, the SCS outlines a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce vehicle miles traveled from automobiles and light duty trucks and thereby reduce GHG emissions from these sources.

The 2016-2040 RTP/SCS projects that the SCAG region will meet or exceed the passenger per capita targets set in 2010 by CARB. It is projected that VMT per capita in the region for year 2040 would be reduced by 7.4 percent with implementation of the 2016-2040 RTP/SCS compared to a no-plan year 2040 scenario. Under the 2016-2040 RTP/SCS, SCAG anticipates lowering GHG emissions 8 percent below 2005 levels by 2020, 18 percent by 2035, and 21 percent by 2040. The 18 percent reduction by 2035 over 2005 levels represents a 2 percent increase in reduction compared to the 2012 RTP/SCS projection. Overall, the SCS is meant to provide growth strategies that will achieve the aforementioned regional GHG emissions reduction targets. Land use strategies to achieve the region's targets include planning for new growth around high quality transit

areas and livable corridors, and creating neighborhood mobility areas to integrate land use and transportation and plan for more active lifestyles (SCAG 2016). However, the SCS does not require that local general plans, specific plans, or zoning be consistent with the SCS; instead, it provides incentives to governments and developers for consistency.

Assembly Bill 1493

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and was anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the EPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model year 2017 through 2025 light-duty vehicles (see also the discussion on the update to the Corporate Average Fuel Economy standards under *Federal Laws*, above). In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

Executive Order S-01-07

On January 18, 2007, the state set a new LCFS for transportation fuels sold in the state. Executive Order S-01-07 sets a declining standard for GHG emissions measured in carbon dioxide equivalent gram per unit of fuel energy sold in California. The LCFS requires a reduction of 2.5 percent in the carbon intensity of California's transportation fuels by 2015 and a reduction of at least 10 percent by 2020. The standard applies to refiners, blenders, producers, and importers of transportation fuels, and would use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods.

Senate Bills 1078, 107, X1-2, and Executive Order S-14-08

A major component of California's Renewable Energy Program is the RPS established under Senate Bills 1078 (Sher) and 107 (Simitian). Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. Executive Order S-14-08 was signed in November 2008, which expanded the state's Renewable Energy Standard to 33 percent renewable power by 2020. This standard was adopted by the legislature in 2011 (SB X1-2). Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects, because electricity production from renewable sources is generally considered carbon neutral.

Senate Bill 350

Senate Bill 350 (de Leon), was signed into law in September 2015. SB 350 establishes tiered increases to the RPS of 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double

the energy efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

Executive Order B-16-2012

On March 23, 2012, the state identified that CARB, the California Energy Commission (CEC), the Public Utilities Commission, and other relevant agencies worked with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to accommodate zero-emissions vehicles in major metropolitan areas, including infrastructure to support them (e.g., electric vehicle charging stations). The executive order also directs the number of zero-emission vehicles in California's state vehicle fleet to increase through the normal course of fleet replacement so that at least 10 percent of fleet purchases of light-duty vehicles are zero-emission by 2015 and at least 25 percent by 2020. The executive order also establishes a target for the transportation sector of reducing GHG emissions from the transportation sector 80 percent below 1990 levels.

California Building Code: Building Energy Efficiency Standards

Energy conservation standards for new residential and non-residential buildings were adopted by the California Energy Resources Conservation and Development Commission (now the CEC) in June 1977 and most recently revised in 2016 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. On June 10, 2015, the CEC adopted the 2016 Building Energy Efficiency Standards, which went into effect on January 1, 2017.

The 2016 Standards continues to improve upon the previous 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. Under the 2016 Standards, residential and nonresidential buildings are 28 and 5 percent more energy efficient than the 2013 Standards, respectively (CEC 2015a). Buildings that are constructed in accordance with the 2013 Building Energy Efficiency Standards are 25 percent (residential) to 30 percent (nonresidential) more energy efficient than the prior 2008 standards as a result of better windows, insulation, lighting, ventilation systems, and other features. While the 2016 standards do not achieve zero net energy, they do get very close to the state's goal and make important steps toward changing residential building practices in California. The 2019 standards will take the final step to achieve zero net energy for newly constructed residential buildings throughout California (CEC 2015b).

California Building Code: CALGreen

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (24 CCR, Part 11, known as "CALGreen") was adopted as part of the California Building Standards Code. CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.[12] The mandatory

[12] The green building standards became mandatory in the 2010 edition of the code.

provisions of CALGreen became effective January 1, 2011, and were last updated in 2016. The 2016 CALGreen became effective on January 1, 2017.

2006 Appliance Efficiency Regulations

The 2006 Appliance Efficiency Regulations (20 CCR §§ 1601–1608) were adopted by the CEC on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non–federally regulated appliances. Though these regulations are now often viewed as "business as usual," they exceed the standards imposed by all other states, and they reduce GHG emissions by reducing energy demand.

Solid Waste Regulations

California's Integrated Waste Management Act of 1989 (AB 939; Public Resources Code §§ 40050 et seq.) set a requirement for cities and counties throughout the state to divert 50 percent of all solid waste from landfills by January 1, 2000, through source reduction, recycling, and composting. In 2008, the requirements were modified to reflect a per capita requirement rather than tonnage. To help achieve this, the act requires that each city and county prepare and submit a source reduction and recycling element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity.

AB 341 (Chapter 476, Statutes of 2011) increased the statewide goal for waste diversion to 75 percent by 2020 and requires recycling of waste from commercial and multifamily residential land uses.

The California Solid Waste Reuse and Recycling Access Act (AB 1327; Public Resources Code §§ 42900 et seq.) requires areas to be set aside for collecting and loading recyclable materials in development projects. The act required the California Integrated Waste Management Board to develop a model ordinance for adoption by any local agency requiring adequate areas for collection and loading of recyclable materials as part of development projects. Local agencies are required to adopt the model or an ordinance of their own.

Section 5.408 of the 2016 CALGreen also requires that at least 65 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

In October of 2014 Governor Brown signed AB 1826, requiring businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses, including multifamily residential dwellings that consist of five or more units. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste.

Water Efficiency Regulations

The 20x2020 Water Conservation Plan was issued by the Department of Water Resources (DWR) in 2010 pursuant to Senate Bill 7, which was adopted during the 7th Extraordinary Session of 2009–2010 and therefore dubbed "SBX7-7." SBX7-7 mandated urban water conservation and authorized the DWR to prepare a plan implementing urban water conservation requirements (20x2020 Water Conservation Plan). In addition, it required agricultural water providers to prepare agricultural water management plans, measure

water deliveries to customers, and implement other efficiency measures. SBX7-7 requires urban water providers to adopt a water conservation target of 20 percent reduction in urban per capita water use by 2020 compared to 2005 baseline use.

The Water Conservation in Landscaping Act of 2006 (AB 1881) requires local agencies to adopt the updated DWR model ordinance or equivalent. AB 1881 also requires the CEC to consult with the DWR to adopt, by regulation, performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

Thresholds of Significance

The CEQA Guidelines recommend that a lead agency consider the following when assessing the significance of impacts from GHG emissions on the environment:

1. The extent to which the project may increase (or reduce) GHG emissions as compared to the existing environmental setting;

2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;

3. The extent to which the project complies with regulations or requirements adopted to implement an adopted statewide, regional, or local plan for the reduction or mitigation of GHG emissions.[13]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, SCAQMD has convened a GHG CEQA Significance Threshold Working Group (Working Group). Based on the last Working Group meeting (Meeting No. 15) held in September 2010, SCAQMD is proposing to adopt a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency (SCAQMD 2010):

- **Tier 1.** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.

- **Tier 2.** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e., city or county), project-level and cumulative GHG emissions are less than significant.

[13] The Governor's Office of Planning and Research recommendations include a requirement that such a plan must be adopted through a public review process and include specific requirements that reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

- **Tier 3.** If GHG emissions are less than the screening-level threshold, project-level and cumulative GHG emissions are less than significant.

  For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment of GHG emissions. SCAQMD is proposing a screening-level threshold of 3,000 $MTCO_2e$ annually for all land use types or the following land-use-specific thresholds: 1,400 $MTCO_2e$ for commercial projects, 3,500 $MTCO_2e$ for residential projects, or 3,000 $MTCO_2e$ for mixed-use projects. These bright-line thresholds are based on a review of the Governor's Office of Planning and Research database of CEQA projects. Based on their review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-line threshold would have a nominal, and therefore, less than cumulatively considerable impact on GHG emissions:

- **Tier 4.** If emissions exceed the screening threshold, a more detailed review of the project's GHG emissions is warranted.

  The SCAQMD Working Group has identified an efficiency target for projects that exceed the screening threshold of 4.8 $MTCO_2e$ per year per service population ($MTCO_2e$/year/SP) for project-level analyses and 6.6 $MTCO_2e$/year/SP for plan level projects (e.g., program-level projects such as general plans) for the year 2020.[14] The per capita efficiency targets are based on the AB 32 GHG reduction target and 2020 GHG emissions inventory prepared for CARB's 2008 Scoping Plan.[15] If a proposed project's horizon year is beyond year 2020, the efficiency target would need to be adjusted based on the mid-term GHG reduction target of SB 32, which establishes a target of 40 percent below 1990 levels by 2030, and the long-term reduction goal of Executive Order S-03-05, which sets a goal of 80 percent below 1990 levels by 2050. For the purpose of this project, as the proposed residential building is anticipated to be built by 2020, SCAQMD's project-level thresholds of 3,000 $MTCO_2e$ and 4.8 $MTCO_2e$/year/SP are used. If projects exceed the bright line and per capita efficiency targets, GHG emissions would be considered potentially significant in the absence of mitigation measures.

BIBLIOGRAPHY

Bay Area Air Quality Management District (BAAQMD). 2017, May. California Environmental Quality Act Air Quality Guidelines.

California Air Pollution Control Officers Association (CAPCOA). 2017. California Emissions Estimator Model (CalEEMod). Version 2016.3.2. Prepared by: BREEZE Software, A Division of Trinity Consultants in collaboration with South Coast Air Quality Management District and the California Air Districts.

[14] It should be noted that the Working Group also considered efficiency targets for 2035 for the first time in this Working Group meeting.

[15] SCAQMD took the 2020 statewide GHG reduction target for land use only GHG emissions sectors and divided it by the 2020 statewide employment for the land use sectors to derive a per capita GHG efficiency metric that coincides with the GHG reduction targets of AB 32 for year 2020.

California Air Resources Board (CARB). 1998, April 22. The Report on Diesel Exhaust. http://www.arb.ca.gov/toxics/dieseltac/de-fnds.htm.

———. 1999. California Air Resources Board (CARB). Final Staff Report: Update to the Toxic Air Contaminant List.

———. 2005, April. Air Quality and Land Use Handbook: A Community Health Perspective. https://www.arb.ca.gov/ch/handbook.pdf

———. 2008, October. Climate Change Proposed Scoping Plan, a Framework for Change.

———. 2010, August. Staff Report Proposed Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375.

———. 2014, May 15. First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006, http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm.

———. 2016, October 1. Ambient Air Quality Standards. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

———. 2017a, May 5. Area Designations Maps/State and National. Accessed February 28, 2018. http://www.arb.ca.gov/desig/desig.htm.

———. 2017b, March 14. Final Proposed Short-Lived Climate Pollutant Reduction Strategy. https://www.arb.ca.gov/cc/shortlived/shortlived.htm.

———. 2017c, November. California's 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target. https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

———. 2018a. Air Pollution Data Monitoring Cards (2013, 2014, 2015, 2016, and 2017). Accessed July 30, 2018. http://www.arb.ca.gov/adam/topfour/topfour1.php.

———. 2018b, February. Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets. https://www.arb.ca.gov/cc/sb375/sb375_target_update_final_staff_report_feb2018.pdf.

California Energy Commission (CEC). 2015a, June 10. 2016 Building Energy Efficiency Standards, Adoption Hearing Presentation. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents.

———.2015b. 2016 Building Energy and Efficiency Standards Frequently Asked Questions. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf.

Intergovernmental Panel on Climate Change (IPCC). 1995. Second Assessment Report: Climate Change 1995.

———. 2001. Third Assessment Report: Climate Change 2001. New York: Cambridge University Press.

———. 2007. Fourth Assessment Report: Climate Change 2007. New York: Cambridge University Press.

———. 2013. Fifth Assessment Report: Climate Change 2013. New York: Cambridge University Press.

South Coast Air Quality Management District (SCAQMD). 1993. California Environmental Quality Act Air Quality Handbook.

———. 2005, May. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. http://www.aqmd.gov/home/library/documents-support-material/planning-guidance/guidance-document.

———. 2008a, September. Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III). http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iii.

———. 2008b, July. Final Localized Significance Threshold Methodology. http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf.

———. 2010, September 28. Greenhouse Gases (GHG) CEQA Significance Thresholds Working Group Meeting 15. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-main-presentation.pdf.

———. 2011. Fact Sheet for Applying CalEEMod to Localized Significance Thresholds. http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod-guidance.pdf?sfvrsn=2

———. 2012, May 4. Final 2012 Lead State Implementation Plan: Los Angeles County. http://www3.aqmd.gov/hb/attachments/2011-2015/2012May/2012-May4-030.pdf.

———. 2015a, October 3. Final Report Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES IV). http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv.

———. 2015b, March (revised). SCAQMD Air Quality Significance Thresholds. http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2.

———. 2015c. Health Effects of Air Pollution. http://www.aqmd.gov/home/library/public-information/publications.

———. 2015d, October. "Blueprint for Clean Air: 2016 AQMP White Paper." 2016 AQMP White Papers Web Page. http://www.aqmd.gov/home/about/groups-committees/aqmp-advisory-group/2016-aqmp-white-papers.

———. 2017, March 4. Final 2016 Air Quality Management Plan. http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp

Southern California Association of Governments (SCAG). 2016, April. The 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): A Plan for Mobility, Accessibility, Sustainability, and a High Quality of Life. http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS.pdf.

US Environmental Protection Agency (USEPA). 2009, December. EPA: Greenhouse Gases Threaten Public Health and the Environment. Science overwhelmingly shows greenhouse gas concentrations at unprecedented levels due to human activity. http://yosemite.epa.gov/opa/admpress.nsf/0/08D11A451131BCA585257685005BF252.

———. 2018a. Criteria Air Pollutants. Accessed April 4, 2018. https://www.epa.gov/criteria-air-pollutants.

———. 2018b. Overview of Greenhouse Gases. Accessed March 1, 2018. http://www3.epa.gov/climatechange/ghgemissions/gases.html.

Western Regional Climate Center (WRCC). 2018a. Western U.S. Climate Summaries – Yorba Linda (Station ID No. 049847). Accessed August 15, 2018, http://www.wrcc.dri.edu/summary/Climsmsca.html.

———. 2015b, Western U.S. Climate Summaries – Brea Berry & Imper (Station ID No. 0410541). Accessed August 15, 2018, http://www.wrcc.dri.edu/summary/Climsmsca.html.

CalEEMod Project Characteristics Inputs (Operation)

Name:	Mercury Residential Project
Project Location:	City of Brea
County/Air Basin:	Los Angeles - South Coast County
Climate Zone:	8
Land Use Setting:	Urban
Operational Year:	2020
Utility Company:	Southern California Edison
Air Basin:	South Coast Air Basin
Air District:	SCAQMD
SRA:	16

Total Project Site Area 1.01 acres

Project Components	SQFT	Units	Population
Residential Units (Mid-Rise)	**59,292**	**120**	**337**
Common/Service Areas	17,993		
Amentities	5,413		
Parking Garage	88,735		
Landscape	58,883		

CalEEMod Land Use Inputs

Land Use	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
Residential Units (Mid-Rise)(Common/Service Areas)	Residential	Apartments Mid Rise	120	DU	1.01	59,292
Parking Garage	Parking	Enclosed Parking with Elevator	88.74	sq. feet	0.00	88,735
					1.01	

Trip Generation

Residential	Weekday	
Trip Generation*	653	Average Daily Trips (ADT)

Land Use	**Calculated Weekday Trip Rate**	ITE Weekday Trip Rate**	Adjusted Saturday Trip Rate	**ITE Saturday Trip Rate****	Adjusted Sunday Trip Rate	**ITE Sunday Trip Rate****
Residential	5.44	*5.44*	*4.912*	4.91	*4.091*	4.09

*Consistent with Transportation/Traffic Section.

**ITE Trip Generation Manul 10th Edition.

	Weekday	**Saturday**	**Sunday**
Daily Trips:	653	589	491

Primary Trips	100	%
Diverted Trips	0	%
Pass-by Trips	0	%

Area

No Woodstoves
No Fireplaces

Water and Wastewater

Septic Tank	0%
Aerobic	100%
Facultative Lagoons	0%

Water Demand	Acre-Feet per Year*	Cubic-Feet per Year	Gallons per Year
Residential Units	83.35	3,630,706	27,159,602
Landscaped Areas	0.51	22,216	166,184

* City of Brea; Chapter 3.18, Utilities and Service Systems, of this IS/MND.

Solid Waste

Solid Waste per DU*	8.6	pounds per day	Residential Solid Waste	1,032	pounds per day
				188	TPY

**City of Brea; Chapter 3.18, Utilities and Service Systems, of this IS/MND.

Water Mitigation

Install Low Flow Bathroom Faucet	32	% Reduction in flow
Install Low Flow Kitchen Faucet	18	% Reduction in flow
Install Low Flow Toilet	20	% Reduction in flow
Install Low Flow Shower	20	% Reduction in flow
Use Water Efficiency Irrigation System	6.1	% Reduction in flow

CalEEMod Project Characteristics Inputs (Construction)

Name:	Mercury Residential Project
Project Location:	City of Brea
County/Air Basin:	Los Angeles - South Coast County
Climate Zone:	8
Land Use Setting:	Urban
Operational Year:	2020
Utility Company:	Southern California Edison
Air Basin:	South Coast Air Basin
Air District:	SCAQMD
SRA:	16

Total Project Site Area 1.01 acres

Project Components	SQFT
Residential Units (Mid-Rise)	**59,292**
Common/Service Areas	17,993
Amentities	5,413
Parking Garage	88,735
Landscape	58,883

CalEEMod Land Use Inputs

Land Use	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
Residential Units (Mid-Rise)(Common/Service Areas)	Residential	Apartments Mid Rise	120	DU	1.01	59,292
Parking Garage	Parking	Enclosed Parking with Elevator	88.74	sq. feet	0.00	88,735
					1.01	

Dust from Material Movement

Construction Phase Name	Material Exported (Cubic Yards)*	CY/Truck	Trucks	Duration (days)	Trips Total*	Trips/Day*
Excavation/Shoring Haul	25,000	28	893	12	1786	150

*Provided by the Applicant's construction contractor, Peregrine Construction, Inc. The 25,000 CY would be transported in double-loader bottom-dump semi trailers.

Concrete Trucks

Construction Phase Name	Trips Total*	Pour Days*	Trips/Day
Foundation	950	10	95

*Provided by the Applicant's construction contractor, Peregrine Construction, Inc.

Trips and VMT

PhaseName	Trips/Worker	Trips/Vendor	Total Hauling Trips
Excavation/Shoring	5*	2	0
Soil Excavation	0*	0*	1786
Foundations	124*	97	0*
Vertical Construction**	80	27*	0*

*CalEEMod Default

** The Applicant's construction contractor, Peregrine Construction, Inc., provided an estimate of workers for vertical building construction.

Construction Mitigation

SCAQMD Rule 403	PM10:	5	% Reduction
	PM25:	5	% Reduction
Water Exposed Area	Frequency:	2	per day
	PM10:	55	% Reduction
	PM25:	55	% Reduction
Unpaved Roads	Vehicle Speed:	15	mph
SCAQMD Rule 1186			
	Clean Paved Road	9	% PM Reduction

Changes to the CalEEMod Defaults - Fleet Mix 2020

					Trips	653								
Default	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH	
Fleet Mix (Model Default)	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.01616	0.001677	0.001586	0.004867	0.000586	0.001002	100%
Trips	363	29	137	76	11	4	16	11	1	1	3	0	1	653
Percent	82%			12%	7%									100%
without buses	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0	0	0.004867	0	0	100%
Percent	82%			12%	6%									100%
Adjusted without buses/MH	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.000000	0.000000	0.004867	0.000000	0.000000	
Percent check	82%			12%	6%									100%
Assumed Mix	97.0%			2.00%	1.00%									100%
adjusted with Assumed	0.661670	0.052185	0.250353	0.020000	0.002631	0.000909	0.003924	0.002536	0.000000	0.000000	0.005792	0.000000	0.000000	100%
Trips	432	34	163	13	2	1	3	2	0	0	4	0	0	653
Percent check	97%			2%	1%									

Construction Activities and Schedule Assumptions (Mercury Residential)

Construction Activities		Construction Schedule		
Phase Name	Phase Type	Start Date	End Date	CalEEMod Days
Excavation/Shoring	Site Preparation	2/1/2019	3/15/2019	31
Soil Export	Site Preparation	2/1/2019	2/18/2019	12
Utility Installation	Trenching	3/16/2019	4/12/2019	20
Foundations	Building Construction	4/16/2019	8/7/2019	82
Vertical Construction	Building Construction	8/15/2019	4/25/2020	182
Interior/Exterior Coatings	Architectural Coatings	5/15/2020	7/10/2020	41
Paving	Asphalt Paving	7/15/2020	7/29/2020	11

CalEEMod Construction Off-Road Equipment Inputs

Source: Construction Equipment provided by Peregrine Construction, Inc.

General Construction Hours: 8 hours btwn 7:00 AM to 4:00 PM

	Construction Equipment Details				
Equipment	**# of Equipment**	**Model**	**hp**	**hrs/ day**	**total days**
Excavation/Shoring					
Excavators	1	CAT 330	235	8	
Rubber Tired Dozers	1	CAT 980	412	8	
Soil Export					
N/A (Equipment Included in Excavation/Shoring)	0		0	0	
Utility Installation					
Mini-Excavator	1	CAT 305	44	8	
Foundations					
Pumps	1		84	8	10
Vertical Construction					
Forklifts	1	Gradall - G6-42P	99	8	270
Interior/Exterior Coatings					
Air Compressors	1		78	8	60
Paving					
N/A	0				

*Based on CalEEMod defaults for soil export.

Regional Construction Emissions Worksheet - Unmitigated

*CalEEMod, Version 2016.3.2

Excavation/Shoring			ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite		**2019**						
	Fugitive Dust		0.00	0.00	0.00	0.00	6.02	3.31
	Off-Road		2.70	30.58	19.84	0.03	1.30	1.20
	Total		**2.70**	**30.58**	**19.84**	**0.03**	**7.33**	**4.51**
Offsite								
	Hauling		0.00	0.00	0.00	0.00	0.00	0.00
	Vendor		0.01	0.23	0.07	0.00	0.01	0.01
	Worker		0.02	0.01	0.18	0.00	0.06	0.02
	Total		**0.03**	**0.24**	**0.24**	**0.00**	**0.07**	**0.02**
TOTAL EXCAVATION & SHORING			***2.73***	***30.82***	***20.08***	***0.03***	***7.40***	***4.53***

Soil Export			ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite		**2019**						
	Fugitive Dust		0.00	0.00	0.00	0.00	0.32	0.05
	Off-Road		0.00	0.00	0.00	0.00	0.00	0.00
	Total		**0.00**	**0.00**	**0.00**	**0.00**	**0.32**	**0.05**
Offsite								
	Hauling		1.27	44.70	11.20	0.12	2.76	0.88
	Vendor		0.00	0.00	0.00	0.00	0.00	0.00
	Worker		0.00	0.00	0.00	0.00	0.00	0.00
	Total		**1.27**	**44.70**	**11.20**	**0.12**	**2.76**	**0.87**
TOTAL SOIL EXPORT			***1.27***	***44.70***	***11.20***	***0.12***	***3.09***	***0.92***

Excavation and Shoring + Soil Export								
Onsite		**2019**						
	Fugitive Dust		0.00	0.00	0.00	0.00	6.35	3.36
	Off-Road		2.70	30.58	19.84	0.03	1.30	1.20
	Total		**2.70**	**30.58**	**19.84**	**0.03**	**7.65**	**4.56**
Offsite								
	Hauling		1.27	44.70	11.20	0.12	2.76	0.88
	Vendor		0.01	0.23	0.07	0.00	0.01	0.01
	Worker		0.02	0.01	0.18	0.00	0.06	0.02
	Total		1.30	44.94	11.43	0.12	2.84	0.89
TOTAL COMBINED			**4.00**	**75.52**	**31.28**	**0.15**	**10.49**	**5.45**

Utility Installation							
		ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite	**2019**						
	Off-Road	0.19	1.24	1.36	0.00	0.07	0.07
	Total	**0.19**	**1.24**	**1.36**	**0.00**	**0.07**	**0.07**
Offsite							
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Vendor	0.00	0.00	0.00	0.00	0.00	0.00
	Worker	0.01	0.01	0.11	0.00	0.03	0.01
	Total	**0.01**	**0.01**	**0.11**	**0.00**	**0.03**	**0.01**
TOTAL		***0.20***	***1.25***	***1.46***	***0.00***	***0.11***	***0.08***

Foundations							
		ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite	**2019**						
	Off-Road	2.79	21.28	15.89	0.04	1.07	1.04
	Total	**2.79**	**21.28**	**15.89**	**0.04**	**1.07**	**1.04**
Offsite							
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Vendor	0.38	11.02	3.19	0.02	0.70	0.25
	Worker	0.58	0.37	4.42	0.01	1.40	0.38
	Total	**0.96**	**11.39**	**7.33**	**0.04**	**2.09**	**0.63**
TOTAL		***3.74***	***32.67***	***23.22***	***0.07***	***3.16***	***1.66***

Vertical Construction							
		ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite	**2019**						
	Off-Road	2.33	16.50	13.92	0.02	0.96	0.92
	Total	**2.33**	**16.50**	**13.92**	**0.02**	**0.96**	**0.92**
Offsite							
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Vendor	0.11	3.07	0.89	0.01	0.19	0.07
	Worker	0.37	0.24	2.85	0.01	0.90	0.24
	Total	**0.48**	**3.30**	**3.66**	**0.02**	**1.09**	**0.31**
TOTAL		***2.81***	***19.80***	***17.58***	***0.04***	***2.05***	***1.23***
Vertical Construction		ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite	**2020**						
	Off-Road	2.08	15.26	13.62	0.02	0.83	0.80
	Total	**2.08**	**15.26**	**13.62**	**0.02**	**0.83**	**0.80**
Offsite							
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Vendor	0.09	2.81	0.81	0.01	0.19	0.06
	Worker	0.35	0.21	2.62	0.01	0.90	0.24
	Total	**0.44**	**3.02**	**3.36**	**0.02**	**1.09**	**0.31**
TOTAL		***2.52***	***18.28***	***16.98***	***0.04***	***1.92***	***1.11***

Interior/Exterior Coatings							
		ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite	**2020**						
	Archit. Coating	9.65	0.00	0.00	0.00	0.00	0.00
	Off-Road	0.32	2.25	2.44	0.00	0.15	0.15
	Total	**9.97**	**2.25**	**2.44**	**0.00**	**0.15**	**0.15**
Offsite							
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Vendor	0.00	0.00	0.00	0.00	0.00	0.00
	Worker	0.11	0.07	0.82	0.00	0.28	0.08
	Total	**0.11**	**0.07**	**0.82**	**0.00**	**0.28**	**0.08**
TOTAL		***10.08***	***2.31***	***3.26***	***0.01***	***0.43***	***0.22***

Paving							
		ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite	**2020**						
	Off-Road	0.84	8.45	8.88	0.01	0.47	0.43
	Paving	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.84**	**8.45**	**8.88**	**0.01**	**0.47**	**0.43**
Offsite							
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Vendor	0.00	0.00	0.00	0.00	0.00	0.00
	Worker	0.06	0.03	0.43	0.00	0.15	0.04
	Total	**0.06**	**0.03**	**0.43**	**0.00**	**0.15**	**0.04**
TOTAL		***0.90***	***8.49***	***9.30***	***0.01***	***0.62***	***0.47***

F + VC + P + AC	**20.05**	**81.55**	**70.34**	**0.17**	**8.17**	**4.70**
MAX DAILY	**20**	**82**	**70**	**0**	**10**	**5**
Regional Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Thresholds?	No	No	No	No	No	No

Localized Construction Emissions Worksheet

*CalEEMod, Version 2016.3.2

Excavation/Shoring					
		NOx	CO	PM10 Total	PM2.5 Total
Onsite	**2019**				
	Fugitive Dust	0.00	0.00	6.02	3.31
	Off-Road	30.58	19.84	1.30	1.20
	Total	**30.58**	**19.84**	**7.33**	**4.51**

Soil Export					
		NOx	CO	PM10 Total	PM2.5 Total
Onsite	**2019**				
	Fugitive Dust	0.00	0.00	0.32	0.05
	Off-Road	0.00	0.00	0.00	0.00
	Total	**0.00**	**0.00**	**0.32**	**0.05**

Excavation/Shoring + Soil Export Total		**31**	**20**	**8**	**5**
Excavation/Shoring + Soil Export 1.01-acres LST		**103**	**524**	**58**	**23**
Exceed Threshold?		No	No	No	No

Utility Installation					
		NOx	CO	PM10 Total	PM2.5 Total
Onsite	**2019**				
	Off-Road	1.24	1.36	0.07	0.07
	Total	**1.24**	**1.36**	**0.07**	**0.07**
1.01-acres LST		**103**	**524**	**58**	**23**
Exceed Threshold?		No	No	No	No

Foundations					
		NOx	CO	PM10 Total	PM2.5 Total
Onsite	**2019**				
Off-Road		21.28	15.89	1.07	1.04
Total		**21**	**16**	**1**	**1**
1.01-acres LST		**103**	**524**	**58**	**23**
Exceed Threshold?		No	No	No	No

Vertical Construction					
		NOx	CO	PM10 Total	PM2.5 Total
Onsite	**2019**				
Off-Road		16.50	13.92	0.96	0.92
Total		**16.50**	**13.92**	**0.96**	**0.92**

Vertical Construction		NOx	CO	PM10 Total	PM2.5 Total
Onsite	**2020**				
Off-Road		15.26	13.62	0.83	0.80
Total		**15.26**	**13.62**	**0.83**	**0.80**
2019-2020 Total		**16.50**	**13.92**	**0.96**	**0.92**
1.01-acres LST		**103**	**524**	**58**	**23**
Exceed Threshold?		No	No	No	No

Interior/Exterior Coatings					
		NOx	CO	PM10 Total	PM2.5 Total
Onsite	**2020**				
	Archit. Coating	0.00	0.00	0.00	0.00
	Off-Road	2.25	2.44	0.15	0.15
	Total	**2.25**	**2.44**	**0.15**	**0.15**

Paving					
		NOx	CO	PM10 Total	PM2.5 Total
Onsite	**2020**				
	Off-Road	8.45	8.88	0.47	0.43
	Paving	0.00	0.00	0.00	0.00
	Total	**8.45**	**8.88**	**0.47**	**0.43**

F + VC + P + AC Total	**48.47**	**41.12**	**2.64**	**2.54**

F + VC + P + AC 1.01-acres LST	**103**	**524**	**58**	**23**
Exceeds Thresholds?	No	No	No	No

Regional Operation Emissions Worksheet*

*CalEEMod, Version 2016.3.2 and EMFAC2017, Version 1.0.2

Proposed Project

Summer

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Area	1.62	0.12	9.94	0.00	0.05	0.05
Energy	0.04	0.35	0.15	0.00	0.03	0.03
Mobile	1.04	1.63	15.25	0.05	5.29	1.43
Total	**2.70**	**2.09**	**25.34**	**0.05**	**5.37**	**1.51**

Winter

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Area	1.62	0.12	9.94	0.00	0.05	0.05
Energy	0.04	0.35	0.15	0.00	0.03	0.03
Mobile	1.02	1.74	14.40	0.05	5.29	1.43
Total	**2.68**	**2.20**	**24.48**	**0.05**	**5.37**	**1.51**

Max Daily

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Area	1.62	0.12	9.94	0.00	0.05	0.05
Energy	0.04	0.35	0.15	0.00	0.03	0.03
Mobile	1.04	1.74	15.25	0.05	5.29	1.43
Total	**2.70**	**2.20**	**25.34**	**0.05**	**5.37**	**1.51**
Regional Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Thresholds?	No	No	No	No	No	No

Localized Operation Emissions Worksheet*

*CalEEMod, Version 2016.3.2 and EMFAC2017, Version 1.0.2

Proposed Project

Summer

	NOx	CO	PM10 Total	PM2.5 Total
Area	0.12	9.94	0.05	0.05
Total	**0.12**	**9.94**	**0.05**	**0.05**

Winter

	NOx	CO	PM10 Total	PM2.5 Total
Area	0.12	9.94	0.05	0.05
Total	**0.12**	**9.94**	**0.05**	**0.05**

Max Daily

	NOx	CO	PM10 Total	PM2.5 Total
Area	0.12	9.94	0.05	0.05
Total	**0.12**	**9.94**	**0.05**	**0.05**

1.01-Acre-LST	**103.44**	**524.36**	**14.22**	**5.78**
Exceeds Thresholds?	No	No	No	No

GHG Emissions Inventory

Proposed Project Buildout

Site Preparation

Construction

	$MTCO_2e$ Total*
2019	555
2020	156
Total Construction	**711**

*CalEEMod, Version 2016.3.2.

Operation*

Proposed			
Area	**2**	$MTCO_2e$/Year**	0%
Energy	**281**	$MTCO_2e$/Year	22%
Mobile	**775**	$MTCO_2e$/Year	59%
Solid Waste	**95**	$MTCO_2e$/Year	7%
Water	**130**	$MTCO_2e$/Year	10%
Amortized Construction Emissions***	**24**	$MTCO_2e$/Year	2%
Total	**1,307**	**$MTCO_2e$/Year**	100%
SCAQMD Bright-Line Screening Threshold	3,000	$MTCO_2e$/Year	
Exceed Threshold?	**No**		

*CalEEMod, Version 2016.3.2.

** $MTCO_2e$=metric tons of carbon dioxide equivalent.

*** Total construction emissions are amortized over 30 years per SCAQMD methodology; SCAQMD. 2009, November 19. Greenhouse Gases (GHG) CEQA Significance Thresholds Working Group Meeting 14. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-14/ghg-meeting-14-main-presentation.pdf?sfvrsn=2.

City of Brea - Mercury Residential Project

Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unenclosed Parking with Elevator	88.75	1000sqft	0.00	88,753.00	0
Apartments Mid Rise	120.00	Dwelling Unit	1.01	59,292.00	343

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Refer to project description.

Construction Phase - Based on construction phasing.

Off-road Equipment - Refer to construction equipment list.

Off-road Equipment - Refer to constuction equipment list.

Off-road Equipment - Refer to constuction equipment list.

Off-road Equipment - Refer to construction equipment list.

Off-road Equipment - Refer to construction equipment list soil export of 25,000 cubic yrds.

Off-road Equipment - Refer to construction equipment list.

Off-road Equipment - Refer to constuction equipment list.

Trips and VMT - Refer to construction CalEEMod Inputs.

Grading - Refer to land use description.

Architectural Coating -

Vehicle Trips - Refer to trip generation rates.

Woodstoves - Refer to project desciption.

Water And Wastewater - No septic or lagoons use. Refer to water demand CalEEMod Inputs.

Solid Waste - Refer to solid waste generation - CalEEMod Input.

Construction Off-road Equipment Mitigation - SCAQMD Rull 403 and 1186.

Fleet Mix - Refer to fleet mix CalEEMod Inputs.

Stationary Sources - Emergency Generators and Fire Pumps -

Stationary Sources - Process Boilers -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	10.00	41.00
tblConstructionPhase	NumDays	200.00	82.00

tblConstructionPhase	NumDays	200.00	182.00
tblConstructionPhase	NumDays	10.00	11.00
tblConstructionPhase	NumDays	2.00	31.00
tblConstructionPhase	NumDays	2.00	12.00
tblFireplaces	NumberGas	102.00	0.00
tblFireplaces	NumberNoFireplace	12.00	0.00
tblFireplaces	NumberWood	6.00	0.00
tblFleetMix	HHD	0.02	2.5358e-003
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.56	0.66
tblFleetMix	LDA	0.56	0.00
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.21	0.25
tblFleetMix	LDT2	0.21	0.00
tblFleetMix	LHD1	0.02	2.6307e-003
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.7950e-003	9.0933e-004
tblFleetMix	LHD2	5.7950e-003	0.00
tblFleetMix	MCY	4.8670e-003	5.7923e-003
tblFleetMix	MCY	4.8670e-003	0.00
tblFleetMix	MDV	0.12	0.02
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	1.0020e-003	0.00
tblFleetMix	MH	1.0020e-003	0.00
tblFleetMix	MHD	0.03	3.9242e-003
tblFleetMix	MHD	0.03	0.00

tblFleetMix	OBUS	1.6770e-003	0.00
tblFleetMix	OBUS	1.6770e-003	0.00
tblFleetMix	SBUS	5.8600e-004	0.00
tblFleetMix	SBUS	5.8600e-004	0.00
tblFleetMix	UBUS	1.5860e-003	0.00
tblFleetMix	UBUS	1.5860e-003	0.00
tblGrading	AcresOfGrading	15.50	0.00
tblGrading	AcresOfGrading	0.00	1.01
tblGrading	MaterialExported	0.00	25,000.00
tblLandUse	LandUseSquareFeet	88,750.00	88,753.00
tblLandUse	LandUseSquareFeet	120,000.00	59,292.00
tblLandUse	LotAcreage	2.04	0.00
tblLandUse	LotAcreage	3.16	1.01
tblOffRoadEquipment	HorsePower	89.00	99.00
tblOffRoadEquipment	HorsePower	247.00	412.00
tblOffRoadEquipment	HorsePower	158.00	235.00
tblOffRoadEquipment	HorsePower	158.00	44.00
tblOffRoadEquipment	HorsePower	84.00	231.00
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.74	0.56
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblSolidWaste	SolidWasteGenerationRate	55.20	188.00
tblTripsAndVMT	HaulingTripNumber	3,125.00	1,786.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	27.00	97.00
tblTripsAndVMT	WorkerTripNumber	10.00	5.00
tblTripsAndVMT	WorkerTripNumber	124.00	80.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	6.39	4.91
tblVehicleTrips	SU_TR	5.86	4.09
tblVehicleTrips	WD_TR	6.65	5.44
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	7,818,483.07	27,159,602.00
tblWater	OutdoorWaterUseRate	4,929,043.68	166,184.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	6.00	0.00
tblWoodstoves	NumberNoncatalytic	6.00	0.00

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					
2019	0.3395	3.0953	2.2045	6.1100e-003	0.2447	0.1179	0.3627	0.0922	0.1130	0.2052	0.0000	553.2188	553.2188	0.0701	0.0000	554.9710
2020	0.3144	0.8552	0.8173	1.7800e-003	0.0499	0.0410	0.0909	0.0134	0.0395	0.0529	0.0000	155.1796	155.1796	0.0204	0.0000	155.6885
Maximum	**0.3395**	**3.0953**	**2.2045**	**6.1100e-003**	**0.2447**	**0.1179**	**0.3627**	**0.0922**	**0.1130**	**0.2052**	**0.0000**	**553.2188**	**553.2188**	**0.0701**	**0.0000**	**554.9710**

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					
2019	0.3395	3.0953	2.2045	6.1100e-003	0.1791	0.1179	0.2971	0.0599	0.1130	0.1729	0.0000	553.2185	553.2185	0.0701	0.0000	554.9706
2020	0.3144	0.8552	0.8173	1.7800e-003	0.0461	0.0410	0.0871	0.0125	0.0395	0.0520	0.0000	155.1795	155.1795	0.0204	0.0000	155.6883
Maximum	**0.3395**	**3.0953**	**2.2045**	**6.1100e-003**	**0.1791**	**0.1179**	**0.2971**	**0.0599**	**0.1130**	**0.1729**	**0.0000**	**553.2185**	**553.2185**	**0.0701**	**0.0000**	**554.9706**

	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**	**23.55**	**0.01**	**15.30**	**31.43**	**0.00**	**12.85**	**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)
2	11-17-2018	2-16-2019	0.4544	0.4544
3	2-17-2019	5-16-2019	0.7726	0.7726
4	5-17-2019	8-16-2019	1.0917	1.0917
5	8-17-2019	11-16-2019	0.7418	0.7418
6	11-17-2019	2-16-2020	0.7126	0.7126
7	2-17-2020	5-16-2020	0.5209	0.5209
8	5-17-2020	8-16-2020	0.2933	0.2933
		Highest	1.0917	1.0917

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	0.2777	0.0144	1.2428	7.0000e-005		6.8300e-003	6.8300e-003		6.8300e-003	6.8300e-003	0.0000	2.0237	2.0237	1.9800e-003	0.0000	2.0731
Energy	7.3900e-003	0.0632	0.0269	4.0000e-004		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	280.0319	280.0319	9.9400e-003	3.1100e-003	281.2068
Mobile	0.1715	0.3077	2.5353	8.5400e-003	0.8924	6.4000e-003	0.8988	0.2371	5.9200e-003	0.2430	0.0000	774.3132	774.3132	0.0233	0.0000	774.8950
Waste						0.0000	0.0000		0.0000	0.0000	38.1623	0.0000	38.1623	2.2553	0.0000	94.5455
Water						0.0000	0.0000		0.0000	0.0000	9.6091	113.2672	122.8763	0.0378	0.0219	130.3356
Total	**0.4566**	**0.3853**	**3.8049**	**9.0100e-003**	**0.8924**	**0.0183**	**0.9108**	**0.2371**	**0.0179**	**0.2549**	**47.7714**	**1,169.6359**	**1,217.4074**	**2.3283**	**0.0250**	**1,283.0559**

2.2 Overall Operational

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	0.2777	0.0144	1.2428	7.0000e-005		6.8300e-003	6.8300e-003		6.8300e-003	6.8300e-003	0.0000	2.0237	2.0237	1.9800e-003	0.0000	2.0731
Energy	7.3900e-003	0.0632	0.0269	4.0000e-004		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	280.0319	280.0319	9.9400e-003	3.1100e-003	281.2068
Mobile	0.1715	0.3077	2.5353	8.5400e-003	0.8924	6.4000e-003	0.8988	0.2371	5.9200e-003	0.2430	0.0000	774.3132	774.3132	0.0233	0.0000	774.8950
Waste						0.0000	0.0000		0.0000	0.0000	38.1623	0.0000	38.1623	2.2553	0.0000	94.5455
Water						0.0000	0.0000		0.0000	0.0000	9.6091	113.2672	122.8763	0.0378	0.0219	130.3356
Total	**0.4566**	**0.3853**	**3.8049**	**9.0100e-003**	**0.8924**	**0.0183**	**0.9108**	**0.2371**	**0.0179**	**0.2549**	**47.7714**	**1,169.6359**	**1,217.4074**	**2.3283**	**0.0250**	**1,283.0559**

	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

City of Brea - Mercury Residential Project - Orange County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Excavation/Shoring	Site Preparation	2/1/2019	3/15/2019	5	31	
2	Soil Export	Site Preparation	2/1/2019	2/18/2019	5	12	
3	Utility Installation	Trenching	3/16/2019	4/12/2019	5	20	
4	Foundations	Building Construction	4/16/2019	8/7/2019	5	82	
5	Vertical Construction	Building Construction	8/15/2019	4/25/2020	5	182	
6	Interior/Exterior Coatings	Architectural Coating	5/15/2020	7/10/2020	5	41	
7	Paving	Paving	7/15/2020	7/29/2020	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 120,066; Residential Outdoor: 40,022; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 5,325 (Architectural Coating – sqft)

OffRoad Equipment

City of Brea - Mercury Residential Project - Orange County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Excavation/Shoring	Excavators	1	8.00	235	0.41
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Excavation/Shoring	Rubber Tired Dozers	1	8.00	412	0.40
Foundations	Cranes	1	6.00	231	0.29
Soil Export	Graders	0	0.00	187	0.41
Soil Export	Rubber Tired Dozers	0	0.00	247	0.40
Soil Export	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Utility Installation	Excavators	1	8.00	44	0.38
Vertical Construction	Cranes	1	6.00	231	0.29
Foundations	Forklifts	1	6.00	89	0.20
Foundations	Generator Sets	1	8.00	84	0.74
Foundations	Pumps	1	8.00	231	0.56
Vertical Construction	Generator Sets	1	8.00	84	0.74
Excavation/Shoring	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Vertical Construction	Forklifts	1	8.00	99	0.20
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Foundations	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Interior/Exterior Coatings	Air Compressors	1	8.00	78	0.48
Vertical Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Excavation/Shoring	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Foundations	Welders	3	8.00	46	0.45
Vertical Construction	Welders	3	8.00	46	0.45

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
Excavation/Shoring	4	5.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Soil Export	0	0.00	0.00	1,786.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Utility Installation	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Foundations	8	124.00	97.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Vertical Construction	7	80.00	27.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Interior/Exterior Coatings	1	25.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Excavation/Shoring - 2019

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					0.0933	0.0000	0.0933	0.0513	0.0000	0.0513	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0418	0.4740	0.3075	5.0000e-004		0.0202	0.0202		0.0186	0.0186	0.0000	45.1370	45.1370	0.0143	0.0000	45.4940
Total	**0.0418**	**0.4740**	**0.3075**	**5.0000e-004**	**0.0933**	**0.0202**	**0.1136**	**0.0513**	**0.0186**	**0.0699**	**0.0000**	**45.1370**	**45.1370**	**0.0143**	**0.0000**	**45.4940**

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	1.2000e-004	3.5900e-003	9.8000e-004	1.0000e-005	2.0000e-004	2.0000e-005	2.2000e-004	6.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.7599	0.7599	7.0000e-005	0.0000	0.7615
Worker	3.2000e-004	2.4000e-004	2.6200e-003	1.0000e-005	8.5000e-004	1.0000e-005	8.6000e-004	2.3000e-004	1.0000e-005	2.3000e-004	0.0000	0.7608	0.7608	2.0000e-005	0.0000	0.7612
Total	**4.4000e-004**	**3.8300e-003**	**3.6000e-003**	**2.0000e-005**	**1.0500e-003**	**3.0000e-005**	**1.0800e-003**	**2.9000e-004**	**3.0000e-005**	**3.1000e-004**	**0.0000**	**1.5206**	**1.5206**	**9.0000e-005**	**0.0000**	**1.5227**

3.2 Excavation/Shoring - 2019

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					0.0399	0.0000	0.0399	0.0219	0.0000	0.0219	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0418	0.4740	0.3075	5.0000e-004		0.0202	0.0202		0.0186	0.0186	0.0000	45.1370	45.1370	0.0143	0.0000	45.4940
Total	**0.0418**	**0.4740**	**0.3075**	**5.0000e-004**	**0.0399**	**0.0202**	**0.0601**	**0.0219**	**0.0186**	**0.0405**	**0.0000**	**45.1370**	**45.1370**	**0.0143**	**0.0000**	**45.4940**

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	1.2000e-004	3.5900e-003	9.8000e-004	1.0000e-005	1.8000e-004	2.0000e-005	2.1000e-004	5.0000e-005	2.0000e-005	8.0000e-005	0.0000	0.7599	0.7599	7.0000e-005	0.0000	0.7615
Worker	3.2000e-004	2.4000e-004	2.6200e-003	1.0000e-005	7.8000e-004	1.0000e-005	7.9000e-004	2.1000e-004	1.0000e-005	2.1000e-004	0.0000	0.7608	0.7608	2.0000e-005	0.0000	0.7612
Total	**4.4000e-004**	**3.8300e-003**	**3.6000e-003**	**2.0000e-005**	**9.6000e-004**	**3.0000e-005**	**1.0000e-003**	**2.6000e-004**	**3.0000e-005**	**2.9000e-004**	**0.0000**	**1.5206**	**1.5206**	**9.0000e-005**	**0.0000**	**1.5227**

3.3 Soil Export - 2019

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					1.9500e-003	0.0000	1.9500e-003	2.7000e-004	0.0000	2.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.9500e-003**	**0.0000**	**1.9500e-003**	**2.7000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	7.5100e-003	0.2734	0.0651	6.9000e-004	0.0153	1.0300e-003	0.0163	4.2000e-003	9.8000e-004	5.1800e-003	0.0000	69.4435	69.4435	7.3800e-003	0.0000	69.6279
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	0.0000	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
Total	**7.5100e-003**	**0.2734**	**0.0651**	**6.9000e-004**	**0.0153**	**1.0300e-003**	**0.0163**	**4.2000e-003**	**9.8000e-004**	**5.1800e-003**	**0.0000**	**69.4435**	**69.4435**	**7.3800e-003**	**0.0000**	**69.6279**

3.3 Soil Export - 2019

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					8.3000e-004	0.0000	8.3000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.3000e-004**	**0.0000**	**8.3000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	7.5100e-003	0.2734	0.0651	6.9000e-004	0.0143	1.0300e-003	0.0153	3.9400e-003	9.8000e-004	4.9200e-003	0.0000	69.4435	69.4435	7.3800e-003	0.0000	69.6279
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	0.0000	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
Total	**7.5100e-003**	**0.2734**	**0.0651**	**6.9000e-004**	**0.0143**	**1.0300e-003**	**0.0153**	**3.9400e-003**	**9.8000e-004**	**4.9200e-003**	**0.0000**	**69.4435**	**69.4435**	**7.3800e-003**	**0.0000**	**69.6279**

3.4 Utility Installation - 2019

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	1.8800e-003	0.0124	0.0136	2.0000e-005		7.4000e-004	7.4000e-004		6.8000e-004	6.8000e-004	0.0000	1.4364	1.4364	4.5000e-004	0.0000	1.4477
Total	**1.8800e-003**	**0.0124**	**0.0136**	**2.0000e-005**		**7.4000e-004**	**7.4000e-004**		**6.8000e-004**	**6.8000e-004**	**0.0000**	**1.4364**	**1.4364**	**4.5000e-004**	**0.0000**	**1.4477**

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-004	9.0000e-005	1.0100e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2945	0.2945	1.0000e-005	0.0000	0.2947
Total	**1.3000e-004**	**9.0000e-005**	**1.0100e-003**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2945**	**0.2945**	**1.0000e-005**	**0.0000**	**0.2947**

3.4 Utility Installation - 2019

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	1.8800e-003	0.0124	0.0136	2.0000e-005		7.4000e-004	7.4000e-004		6.8000e-004	6.8000e-004	0.0000	1.4364	1.4364	4.5000e-004	0.0000	1.4477
Total	**1.8800e-003**	**0.0124**	**0.0136**	**2.0000e-005**		**7.4000e-004**	**7.4000e-004**		**6.8000e-004**	**6.8000e-004**	**0.0000**	**1.4364**	**1.4364**	**4.5000e-004**	**0.0000**	**1.4477**

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-004	9.0000e-005	1.0100e-003	0.0000	3.0000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2945	0.2945	1.0000e-005	0.0000	0.2947
Total	**1.3000e-004**	**9.0000e-005**	**1.0100e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.1000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2945**	**0.2945**	**1.0000e-005**	**0.0000**	**0.2947**

3.5 Foundations - 2019

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	0.1143	0.8725	0.6514	1.4700e-003		0.0438	0.0438		0.0425	0.0425	0.0000	123.2854	123.2854	0.0161	0.0000	123.6886
Total	**0.1143**	**0.8725**	**0.6514**	**1.4700e-003**		**0.0438**	**0.0438**		**0.0425**	**0.0425**	**0.0000**	**123.2854**	**123.2854**	**0.0161**	**0.0000**	**123.6886**

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	0.0152	0.4603	0.1252	9.9000e-004	0.0250	3.0700e-003	0.0281	7.2200e-003	2.9400e-003	0.0102	0.0000	97.4816	97.4816	8.5100e-003	0.0000	97.6943
Worker	0.0212	0.0155	0.1720	5.5000e-004	0.0558	3.8000e-004	0.0562	0.0148	3.5000e-004	0.0152	0.0000	49.9055	49.9055	1.2300e-003	0.0000	49.9362
Total	**0.0364**	**0.4758**	**0.2972**	**1.5400e-003**	**0.0809**	**3.4500e-003**	**0.0843**	**0.0220**	**3.2900e-003**	**0.0253**	**0.0000**	**147.3871**	**147.3871**	**9.7400e-003**	**0.0000**	**147.6305**

3.5 Foundations - 2019

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	0.1143	0.8725	0.6514	1.4700e-003		0.0438	0.0438		0.0425	0.0425	0.0000	123.2853	123.2853	0.0161	0.0000	123.6885
Total	**0.1143**	**0.8725**	**0.6514**	**1.4700e-003**		**0.0438**	**0.0438**		**0.0425**	**0.0425**	**0.0000**	**123.2853**	**123.2853**	**0.0161**	**0.0000**	**123.6885**

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	0.0152	0.4603	0.1252	9.9000e-004	0.0234	3.0700e-003	0.0265	6.8300e-003	2.9400e-003	9.7700e-003	0.0000	97.4816	97.4816	8.5100e-003	0.0000	97.6943
Worker	0.0212	0.0155	0.1720	5.5000e-004	0.0515	3.8000e-004	0.0518	0.0138	3.5000e-004	0.0141	0.0000	49.9055	49.9055	1.2300e-003	0.0000	49.9362
Total	**0.0364**	**0.4758**	**0.2972**	**1.5400e-003**	**0.0749**	**3.4500e-003**	**0.0784**	**0.0206**	**3.2900e-003**	**0.0239**	**0.0000**	**147.3871**	**147.3871**	**9.7400e-003**	**0.0000**	**147.6305**

3.6 Vertical Construction - 2019

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	0.1153	0.8166	0.6890	1.1200e-003		0.0473	0.0473		0.0456	0.0456	0.0000	93.0829	93.0829	0.0182	0.0000	93.5379
Total	**0.1153**	**0.8166**	**0.6890**	**1.1200e-003**		**0.0473**	**0.0473**		**0.0456**	**0.0456**	**0.0000**	**93.0829**	**93.0829**	**0.0182**	**0.0000**	**93.5379**

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	5.1000e-003	0.1547	0.0421	3.3000e-004	8.4100e-003	1.0300e-003	9.4500e-003	2.4300e-003	9.9000e-004	3.4100e-003	0.0000	32.7594	32.7594	2.8600e-003	0.0000	32.8309
Worker	0.0165	0.0121	0.1340	4.3000e-004	0.0435	3.0000e-004	0.0438	0.0115	2.7000e-004	0.0118	0.0000	38.8721	38.8721	9.6000e-004	0.0000	38.8960
Total	**0.0216**	**0.1667**	**0.1760**	**7.6000e-004**	**0.0519**	**1.3300e-003**	**0.0532**	**0.0140**	**1.2600e-003**	**0.0152**	**0.0000**	**71.6315**	**71.6315**	**3.8200e-003**	**0.0000**	**71.7269**

3.6 Vertical Construction - 2019

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	0.1153	0.8166	0.6890	1.1200e-003		0.0473	0.0473		0.0456	0.0456	0.0000	93.0828	93.0828	0.0182	0.0000	93.5378
Total	**0.1153**	**0.8166**	**0.6890**	**1.1200e-003**		**0.0473**	**0.0473**		**0.0456**	**0.0456**	**0.0000**	**93.0828**	**93.0828**	**0.0182**	**0.0000**	**93.5378**

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	5.1000e-003	0.1547	0.0421	3.3000e-004	7.8800e-003	1.0300e-003	8.9100e-003	2.2900e-003	9.9000e-004	3.2800e-003	0.0000	32.7594	32.7594	2.8600e-003	0.0000	32.8309
Worker	0.0165	0.0121	0.1340	4.3000e-004	0.0401	3.0000e-004	0.0404	0.0107	2.7000e-004	0.0110	0.0000	38.8721	38.8721	9.6000e-004	0.0000	38.8960
Total	**0.0216**	**0.1667**	**0.1760**	**7.6000e-004**	**0.0480**	**1.3300e-003**	**0.0493**	**0.0130**	**1.2600e-003**	**0.0143**	**0.0000**	**71.6315**	**71.6315**	**3.8200e-003**	**0.0000**	**71.7269**

3.6 Vertical 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	0.0864	0.6332	0.5651	9.4000e-004		0.0345	0.0345		0.0332	0.0332	0.0000	77.3595	77.3595	0.0146	0.0000	77.7254
Total	**0.0864**	**0.6332**	**0.5651**	**9.4000e-004**		**0.0345**	**0.0345**		**0.0332**	**0.0332**	**0.0000**	**77.3595**	**77.3595**	**0.0146**	**0.0000**	**77.7254**

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	3.6500e-003	0.1188	0.0323	2.8000e-004	7.0500e-003	6.1000e-004	7.6700e-003	2.0300e-003	5.9000e-004	2.6200e-003	0.0000	27.2758	27.2758	2.2800e-003	0.0000	27.3328
Worker	0.0129	9.0700e-003	0.1029	3.5000e-004	0.0365	2.5000e-004	0.0367	9.6800e-003	2.3000e-004	9.9000e-003	0.0000	31.5453	31.5453	7.2000e-004	0.0000	31.5633
Total	**0.0166**	**0.1279**	**0.1352**	**6.3000e-004**	**0.0435**	**8.6000e-004**	**0.0444**	**0.0117**	**8.2000e-004**	**0.0125**	**0.0000**	**58.8211**	**58.8211**	**3.0000e-003**	**0.0000**	**58.8961**

3.6 Vertical Construction - 2020

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	0.0864	0.6332	0.5651	9.4000e-004		0.0345	0.0345		0.0332	0.0332	0.0000	77.3594	77.3594	0.0146	0.0000	77.7253
Total	**0.0864**	**0.6332**	**0.5651**	**9.4000e-004**		**0.0345**	**0.0345**		**0.0332**	**0.0332**	**0.0000**	**77.3594**	**77.3594**	**0.0146**	**0.0000**	**77.7253**

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	3.6500e-003	0.1188	0.0323	2.8000e-004	6.6000e-003	6.1000e-004	7.2200e-003	1.9200e-003	5.9000e-004	2.5100e-003	0.0000	27.2758	27.2758	2.2800e-003	0.0000	27.3328
Worker	0.0129	9.0700e-003	0.1029	3.5000e-004	0.0336	2.5000e-004	0.0339	8.9800e-003	2.3000e-004	9.2100e-003	0.0000	31.5453	31.5453	7.2000e-004	0.0000	31.5633
Total	**0.0166**	**0.1279**	**0.1352**	**6.3000e-004**	**0.0402**	**8.6000e-004**	**0.0411**	**0.0109**	**8.2000e-004**	**0.0117**	**0.0000**	**58.8211**	**58.8211**	**3.0000e-003**	**0.0000**	**58.8961**

3.7 Interior/Exterior Coatings - 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					
Archit. Coating	0.1978					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6200e-003	0.0460	0.0501	8.0000e-005		3.0300e-003	3.0300e-003		3.0300e-003	3.0300e-003	0.0000	6.9789	6.9789	5.4000e-004	0.0000	6.9924
Total	**0.2045**	**0.0460**	**0.0501**	**8.0000e-005**		**3.0300e-003**	**3.0300e-003**		**3.0300e-003**	**3.0300e-003**	**0.0000**	**6.9789**	**6.9789**	**5.4000e-004**	**0.0000**	**6.9924**

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	2.0000e-003	1.4000e-003	0.0159	5.0000e-005	5.6300e-003	4.0000e-005	5.6600e-003	1.4900e-003	3.0000e-005	1.5300e-003	0.0000	4.8696	4.8696	1.1000e-004	0.0000	4.8724
Total	**2.0000e-003**	**1.4000e-003**	**0.0159**	**5.0000e-005**	**5.6300e-003**	**4.0000e-005**	**5.6600e-003**	**1.4900e-003**	**3.0000e-005**	**1.5300e-003**	**0.0000**	**4.8696**	**4.8696**	**1.1000e-004**	**0.0000**	**4.8724**

3.7 Interior/Exterior Coatings - 2020

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	0.1978					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6200e-003	0.0460	0.0501	8.0000e-005		3.0300e-003	3.0300e-003		3.0300e-003	3.0300e-003	0.0000	6.9789	6.9789	5.4000e-004	0.0000	6.9924
Total	**0.2045**	**0.0460**	**0.0501**	**8.0000e-005**		**3.0300e-003**	**3.0300e-003**		**3.0300e-003**	**3.0300e-003**	**0.0000**	**6.9789**	**6.9789**	**5.4000e-004**	**0.0000**	**6.9924**

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	2.0000e-003	1.4000e-003	0.0159	5.0000e-005	5.1900e-003	4.0000e-005	5.2300e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.8696	4.8696	1.1000e-004	0.0000	4.8724
Total	**2.0000e-003**	**1.4000e-003**	**0.0159**	**5.0000e-005**	**5.1900e-003**	**4.0000e-005**	**5.2300e-003**	**1.3900e-003**	**3.0000e-005**	**1.4200e-003**	**0.0000**	**4.8696**	**4.8696**	**1.1000e-004**	**0.0000**	**4.8724**

3.8 Paving - 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	4.6200e-003	0.0465	0.0488	7.0000e-005		2.5800e-003	2.5800e-003		2.3800e-003	2.3800e-003	0.0000	6.4711	6.4711	2.0500e-003	0.0000	6.5224
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.6200e-003**	**0.0465**	**0.0488**	**7.0000e-005**		**2.5800e-003**	**2.5800e-003**		**2.3800e-003**	**2.3800e-003**	**0.0000**	**6.4711**	**6.4711**	**2.0500e-003**	**0.0000**	**6.5224**

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	2.8000e-004	2.0000e-004	2.2200e-003	1.0000e-005	7.8000e-004	1.0000e-005	7.9000e-004	2.1000e-004	0.0000	2.1000e-004	0.0000	0.6794	0.6794	2.0000e-005	0.0000	0.6798
Total	**2.8000e-004**	**2.0000e-004**	**2.2200e-003**	**1.0000e-005**	**7.8000e-004**	**1.0000e-005**	**7.9000e-004**	**2.1000e-004**	**0.0000**	**2.1000e-004**	**0.0000**	**0.6794**	**0.6794**	**2.0000e-005**	**0.0000**	**0.6798**

3.8 Paving - 2020

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	4.6200e-003	0.0465	0.0488	7.0000e-005		2.5800e-003	2.5800e-003		2.3800e-003	2.3800e-003	0.0000	6.4711	6.4711	2.0500e-003	0.0000	6.5224
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.6200e-003**	**0.0465**	**0.0488**	**7.0000e-005**		**2.5800e-003**	**2.5800e-003**		**2.3800e-003**	**2.3800e-003**	**0.0000**	**6.4711**	**6.4711**	**2.0500e-003**	**0.0000**	**6.5224**

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	2.8000e-004	2.0000e-004	2.2200e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6794	0.6794	2.0000e-005	0.0000	0.6798
Total	**2.8000e-004**	**2.0000e-004**	**2.2200e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6794**	**0.6794**	**2.0000e-005**	**0.0000**	**0.6798**

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	0.1715	0.3077	2.5353	8.5400e-003	0.8924	6.4000e-003	0.8988	0.2371	5.9200e-003	0.2430	0.0000	774.3132	774.3132	0.0233	0.0000	774.8950
Unmitigated	0.1715	0.3077	2.5353	8.5400e-003	0.8924	6.4000e-003	0.8988	0.2371	5.9200e-003	0.2430	0.0000	774.3132	774.3132	0.0233	0.0000	774.8950

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	652.80	589.20	490.80	2,388,630	2,388,630
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Total	652.80	589.20	490.80	2,388,630	2,388,630

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
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	100	0	0
Unenclosed Parking with	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.661670	0.052185	0.250353	0.020000	0.002631	0.000909	0.003924	0.002536	0.000000	0.000000	0.005792	0.000000	0.000000
Unenclosed Parking with Elevator	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

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	206.8544	206.8544	8.5400e-003	1.7700e-003	207.5944
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	206.8544	206.8544	8.5400e-003	1.7700e-003	207.5944
NaturalGas Mitigated	7.3900e-003	0.0632	0.0269	4.0000e-004		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	73.1775	73.1775	1.4000e-003	1.3400e-003	73.6124
NaturalGas Unmitigated	7.3900e-003	0.0632	0.0269	4.0000e-004		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	73.1775	73.1775	1.4000e-003	1.3400e-003	73.6124

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					
Apartments Mid Rise	1.3713e+006	7.3900e-003	0.0632	0.0269	4.0000e-004		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	73.1775	73.1775	1.4000e-003	1.3400e-003	73.6124
Unenclosed 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
Total		**7.3900e-003**	**0.0632**	**0.0269**	**4.0000e-004**		**5.1100e-003**	**5.1100e-003**		**5.1100e-003**	**5.1100e-003**	**0.0000**	**73.1775**	**73.1775**	**1.4000e-003**	**1.3400e-003**	**73.6124**

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					
Apartments Mid Rise	1.3713e+006	7.3900e-003	0.0632	0.0269	4.0000e-004		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	73.1775	73.1775	1.4000e-003	1.3400e-003	73.6124
Unenclosed 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
Total		**7.3900e-003**	**0.0632**	**0.0269**	**4.0000e-004**		**5.1100e-003**	**5.1100e-003**		**5.1100e-003**	**5.1100e-003**	**0.0000**	**73.1775**	**73.1775**	**1.4000e-003**	**1.3400e-003**	**73.6124**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	477036	151.9939	6.2800e-003	1.3000e-003	152.5377
Unenclosed Parking with Elevator	172181	54.8605	2.2600e-003	4.7000e-004	55.0568
Total		**206.8544**	**8.5400e-003**	**1.7700e-003**	**207.5944**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	477036	151.9939	6.2800e-003	1.3000e-003	152.5377
Unenclosed Parking with Elevator	172181	54.8605	2.2600e-003	4.7000e-004	55.0568
Total		**206.8544**	**8.5400e-003**	**1.7700e-003**	**207.5944**

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	0.2777	0.0144	1.2428	7.0000e-005		6.8300e-003	6.8300e-003		6.8300e-003	6.8300e-003	0.0000	2.0237	2.0237	1.9800e-003	0.0000	2.0731
Unmitigated	0.2777	0.0144	1.2428	7.0000e-005		6.8300e-003	6.8300e-003		6.8300e-003	6.8300e-003	0.0000	2.0237	2.0237	1.9800e-003	0.0000	2.0731

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	0.0198					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2200					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	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
Landscaping	0.0379	0.0144	1.2428	7.0000e-005		6.8300e-003	6.8300e-003		6.8300e-003	6.8300e-003	0.0000	2.0237	2.0237	1.9800e-003	0.0000	2.0731
Total	**0.2777**	**0.0144**	**1.2428**	**7.0000e-005**		**6.8300e-003**	**6.8300e-003**		**6.8300e-003**	**6.8300e-003**	**0.0000**	**2.0237**	**2.0237**	**1.9800e-003**	**0.0000**	**2.0731**

6.2 Area by SubCategory

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	0.0198					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2200					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	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
Landscaping	0.0379	0.0144	1.2428	7.0000e-005		6.8300e-003	6.8300e-003		6.8300e-003	6.8300e-003	0.0000	2.0237	2.0237	1.9800e-003	0.0000	2.0731
Total	**0.2777**	**0.0144**	**1.2428**	**7.0000e-005**		**6.8300e-003**	**6.8300e-003**		**6.8300e-003**	**6.8300e-003**	**0.0000**	**2.0237**	**2.0237**	**1.9800e-003**	**0.0000**	**2.0731**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	122.8763	0.0378	0.0219	130.3356
Unmitigated	122.8763	0.0378	0.0219	130.3356

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	27.1596 / 0.166184	122.8763	0.0378	0.0219	130.3356
Unenclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**122.8763**	**0.0378**	**0.0219**	**130.3356**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	27.1596 / 0.166184	122.8763	0.0378	0.0219	130.3356
Unenclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**122.8763**	**0.0378**	**0.0219**	**130.3356**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	38.1623	2.2553	0.0000	94.5455
Unmitigated	38.1623	2.2553	0.0000	94.5455

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	188	38.1623	2.2553	0.0000	94.5455
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**38.1623**	**2.2553**	**0.0000**	**94.5455**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	188	38.1623	2.2553	0.0000	94.5455
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**38.1623**	**2.2553**	**0.0000**	**94.5455**

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

City of Brea - Mercury Residential Project

Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unenclosed Parking with Elevator	88.75	1000sqft	0.00	88,753.00	0
Apartments Mid Rise	120.00	Dwelling Unit	1.01	59,292.00	343

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Refer to project description.

Construction Phase - Based on construction phasing.

Off-road Equipment - Refer to construction equipment list.

Off-road Equipment - Refer to constuction equipment list.

Off-road Equipment - Refer to constuction equipment list.

Off-road Equipment - Refer to construction equipment list.

Off-road Equipment - Refer to construction equipment list soil export of 25,000 cubic yrds.

Off-road Equipment - Refer to construction equipment list.

Off-road Equipment - Refer to constuction equipment list.

Trips and VMT - Refer to construction CalEEMod Inputs.

Grading - Refer to land use description.

Architectural Coating -

Vehicle Trips - Refer to trip generation rates.

Woodstoves - Refer to project desciption.

Water And Wastewater - No septic or lagoons use. Refer to water demand CalEEMod Inputs.

Solid Waste - Refer to solid waste generation - CalEEMod Input.

Construction Off-road Equipment Mitigation - SCAQMD Rull 403 and 1186.

Fleet Mix - Refer to fleet mix CalEEMod Inputs.

Stationary Sources - Emergency Generators and Fire Pumps -

Stationary Sources - Process Boilers -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	10.00	41.00
tblConstructionPhase	NumDays	200.00	82.00

City of Brea - Mercury Residential Project - Orange County, Summer

tblConstructionPhase	NumDays	200.00	182.00
tblConstructionPhase	NumDays	10.00	11.00
tblConstructionPhase	NumDays	2.00	31.00
tblConstructionPhase	NumDays	2.00	12.00
tblFireplaces	NumberGas	102.00	0.00
tblFireplaces	NumberNoFireplace	12.00	0.00
tblFireplaces	NumberWood	6.00	0.00
tblFleetMix	HHD	0.02	2.5358e-003
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.56	0.66
tblFleetMix	LDA	0.56	0.00
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.21	0.25
tblFleetMix	LDT2	0.21	0.00
tblFleetMix	LHD1	0.02	2.6307e-003
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.7950e-003	9.0933e-004
tblFleetMix	LHD2	5.7950e-003	0.00
tblFleetMix	MCY	4.8670e-003	5.7923e-003
tblFleetMix	MCY	4.8670e-003	0.00
tblFleetMix	MDV	0.12	0.02
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	1.0020e-003	0.00
tblFleetMix	MH	1.0020e-003	0.00
tblFleetMix	MHD	0.03	3.9242e-003
tblFleetMix	MHD	0.03	0.00

tblFleetMix	OBUS	1.6770e-003	0.00
tblFleetMix	OBUS	1.6770e-003	0.00
tblFleetMix	SBUS	5.8600e-004	0.00
tblFleetMix	SBUS	5.8600e-004	0.00
tblFleetMix	UBUS	1.5860e-003	0.00
tblFleetMix	UBUS	1.5860e-003	0.00
tblGrading	AcresOfGrading	15.50	0.00
tblGrading	AcresOfGrading	0.00	1.01
tblGrading	MaterialExported	0.00	25,000.00
tblLandUse	LandUseSquareFeet	88,750.00	88,753.00
tblLandUse	LandUseSquareFeet	120,000.00	59,292.00
tblLandUse	LotAcreage	2.04	0.00
tblLandUse	LotAcreage	3.16	1.01
tblOffRoadEquipment	HorsePower	89.00	99.00
tblOffRoadEquipment	HorsePower	247.00	412.00
tblOffRoadEquipment	HorsePower	158.00	235.00
tblOffRoadEquipment	HorsePower	158.00	44.00
tblOffRoadEquipment	HorsePower	84.00	231.00
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.74	0.56
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblSolidWaste	SolidWasteGenerationRate	55.20	188.00
tblTripsAndVMT	HaulingTripNumber	3,125.00	1,786.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	27.00	97.00
tblTripsAndVMT	WorkerTripNumber	10.00	5.00
tblTripsAndVMT	WorkerTripNumber	124.00	80.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	6.39	4.91
tblVehicleTrips	SU_TR	5.86	4.09
tblVehicleTrips	WD_TR	6.65	5.44
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	7,818,483.07	27,159,602.00
tblWater	OutdoorWaterUseRate	4,929,043.68	166,184.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	6.00	0.00
tblWoodstoves	NumberNoncatalytic	6.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2019	3.9631	74.9397	30.6561	0.1490	9.0073	1.4760	10.4833	4.0835	1.3642	5.4477	0.0000	16,158.8595	16,158.8595	2.3618	0.0000	16,217.9045
2020	10.0698	18.2649	16.9768	0.0381	1.0667	0.8516	1.9183	0.2868	0.8205	1.1073	0.0000	3,658.8829	3,658.8829	0.4679	0.0000	3,670.5810
Maximum	**10.0698**	**74.9397**	**30.6561**	**0.1490**	**9.0073**	**1.4760**	**10.4833**	**4.0835**	**1.3642**	**5.4477**	**0.0000**	**16,158.8595**	**16,158.8595**	**2.3618**	**0.0000**	**16,217.9045**

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	lb/day										lb/day					
2019	3.9631	74.9397	30.6561	0.1490	5.1913	1.4760	6.6674	2.1177	1.3642	3.4819	0.0000	16,158.8595	16,158.8595	2.3618	0.0000	16,217.9045
2020	10.0698	18.2649	16.9768	0.0381	0.9857	0.8516	1.8372	0.2669	0.8205	1.0874	0.0000	3,658.8829	3,658.8829	0.4679	0.0000	3,670.5810
Maximum	**10.0698**	**74.9397**	**30.6561**	**0.1490**	**5.1913**	**1.4760**	**6.6674**	**2.1177**	**1.3642**	**3.4819**	**0.0000**	**16,158.8595**	**16,158.8595**	**2.3618**	**0.0000**	**16,217.9045**

	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**	**38.68**	**0.00**	**31.42**	**45.44**	**0.00**	**30.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	lb/day										lb/day					
Area	1.6172	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547	0.0000	17.8457	17.8457	0.0174	0.0000	18.2816
Energy	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
Mobile	1.0419	1.6291	15.2461	0.0514	5.2519	0.0370	5.2889	1.3933	0.0342	1.4275		5,133.3922	5,133.3922	0.1509		5,137.1640
Total	**2.6996**	**2.0903**	**25.3356**	**0.0541**	**5.2519**	**0.1196**	**5.3715**	**1.3933**	**0.1169**	**1.5102**	**0.0000**	**5,593.2347**	**5,593.2347**	**0.1768**	**8.1000e-003**	**5,600.0690**

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	lb/day										lb/day					
Area	1.6172	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547	0.0000	17.8457	17.8457	0.0174	0.0000	18.2816
Energy	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
Mobile	1.0419	1.6291	15.2461	0.0514	5.2519	0.0370	5.2889	1.3933	0.0342	1.4275		5,133.3922	5,133.3922	0.1509		5,137.1640
Total	**2.6996**	**2.0903**	**25.3356**	**0.0541**	**5.2519**	**0.1196**	**5.3715**	**1.3933**	**0.1169**	**1.5102**	**0.0000**	**5,593.2347**	**5,593.2347**	**0.1768**	**8.1000e-003**	**5,600.0690**

	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	Excavation/Shoring	Site Preparation	2/1/2019	3/15/2019	5	31	
2	Soil Export	Site Preparation	2/1/2019	2/18/2019	5	12	
3	Utility Installation	Trenching	3/16/2019	4/12/2019	5	20	
4	Foundations	Building Construction	4/16/2019	8/7/2019	5	82	
5	Vertical Construction	Building Construction	8/15/2019	4/25/2020	5	182	
6	Interior/Exterior Coatings	Architectural Coating	5/15/2020	7/10/2020	5	41	
7	Paving	Paving	7/15/2020	7/29/2020	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 120,066; Residential Outdoor: 40,022; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 5,325 (Architectural Coating – sqft)

OffRoad Equipment

City of Brea - Mercury Residential Project - Orange County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Excavation/Shoring	Excavators	1	8.00	235	0.41
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Excavation/Shoring	Rubber Tired Dozers	1	8.00	412	0.40
Foundations	Cranes	1	6.00	231	0.29
Soil Export	Graders	0	0.00	187	0.41
Soil Export	Rubber Tired Dozers	0	0.00	247	0.40
Soil Export	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Utility Installation	Excavators	1	8.00	44	0.38
Vertical Construction	Cranes	1	6.00	231	0.29
Foundations	Forklifts	1	6.00	89	0.20
Foundations	Generator Sets	1	8.00	84	0.74
Foundations	Pumps	1	8.00	231	0.56
Vertical Construction	Generator Sets	1	8.00	84	0.74
Excavation/Shoring	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Vertical Construction	Forklifts	1	8.00	99	0.20
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Foundations	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Interior/Exterior Coatings	Air Compressors	1	8.00	78	0.48
Vertical Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Excavation/Shoring	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Foundations	Welders	3	8.00	46	0.45
Vertical Construction	Welders	3	8.00	46	0.45

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
Excavation/Shoring	4	5.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Soil Export	0	0.00	0.00	1,786.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Utility Installation	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Foundations	8	124.00	97.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Vertical Construction	7	80.00	27.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Interior/Exterior Coatings	1	25.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Excavation/Shoring - 2019

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	lb/day										lb/day					
Fugitive Dust					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102			0.0000			0.0000
Off-Road	2.6978	30.5827	19.8415	0.0324		1.3047	1.3047		1.2003	1.2003		3,210.0028	3,210.0028	1.0156		3,235.3931
Total	**2.6978**	**30.5827**	**19.8415**	**0.0324**	**6.0221**	**1.3047**	**7.3268**	**3.3102**	**1.2003**	**4.5106**		**3,210.0028**	**3,210.0028**	**1.0156**		**3,235.3931**

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	lb/day										lb/day					
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
Vendor	7.5000e-003	0.2270	0.0600	5.0000e-004	0.0128	1.5300e-003	0.0143	3.6800e-003	1.4700e-003	5.1400e-003		54.5938	54.5938	4.6100e-003		54.7090
Worker	0.0206	0.0135	0.1784	5.6000e-004	0.0559	3.7000e-004	0.0563	0.0148	3.4000e-004	0.0152		56.3070	56.3070	1.3800e-003		56.3416
Total	**0.0281**	**0.2405**	**0.2384**	**1.0600e-003**	**0.0687**	**1.9000e-003**	**0.0706**	**0.0185**	**1.8100e-003**	**0.0203**		**110.9008**	**110.9008**	**5.9900e-003**		**111.0506**

3.2 Excavation/Shoring - 2019

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	lb/day										lb/day					
Fugitive Dust					2.5744	0.0000	2.5744	1.4151	0.0000	1.4151			0.0000			0.0000
Off-Road	2.6978	30.5827	19.8415	0.0324		1.3047	1.3047		1.2003	1.2003	0.0000	3,210.0028	3,210.0028	1.0156		3,235.3931
Total	**2.6978**	**30.5827**	**19.8415**	**0.0324**	**2.5744**	**1.3047**	**3.8791**	**1.4151**	**1.2003**	**2.6155**	**0.0000**	**3,210.0028**	**3,210.0028**	**1.0156**		**3,235.3931**

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	lb/day										lb/day					
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
Vendor	7.5000e-003	0.2270	0.0600	5.0000e-004	0.0120	1.5300e-003	0.0135	3.4800e-003	1.4700e-003	4.9400e-003		54.5938	54.5938	4.6100e-003		54.7090
Worker	0.0206	0.0135	0.1784	5.6000e-004	0.0515	3.7000e-004	0.0519	0.0138	3.4000e-004	0.0141		56.3070	56.3070	1.3800e-003		56.3416
Total	**0.0281**	**0.2405**	**0.2384**	**1.0600e-003**	**0.0635**	**1.9000e-003**	**0.0654**	**0.0172**	**1.8100e-003**	**0.0190**		**110.9008**	**110.9008**	**5.9900e-003**		**111.0506**

3.3 Soil Export - 2019

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	lb/day										lb/day					
Fugitive Dust					0.3249	0.0000	0.3249	0.0453	0.0000	0.0453			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.3249**	**0.0000**	**0.3249**	**0.0453**	**0.0000**	**0.0453**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

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	lb/day										lb/day					
Hauling	1.2372	44.1165	10.5762	0.1155	2.5916	0.1694	2.7610	0.7095	0.1621	0.8716		12,837.9559	12,837.9559	1.3402		12,871.4608
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
Worker	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
Total	**1.2372**	**44.1165**	**10.5762**	**0.1155**	**2.5916**	**0.1694**	**2.7610**	**0.7095**	**0.1621**	**0.8716**		**12,837.9559**	**12,837.9559**	**1.3402**		**12,871.4608**

3.3 Soil Export - 2019

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	lb/day										lb/day					
Fugitive Dust					0.1389	0.0000	0.1389	0.0194	0.0000	0.0194			0.0000			0.0000
Off-Road	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
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.1389**	**0.0000**	**0.1389**	**0.0194**	**0.0000**	**0.0194**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

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	lb/day										lb/day					
Hauling	1.2372	44.1165	10.5762	0.1155	2.4145	0.1694	2.5840	0.6660	0.1621	0.8281		12,837.9559	12,837.9559	1.3402		12,871.4608
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
Worker	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
Total	**1.2372**	**44.1165**	**10.5762**	**0.1155**	**2.4145**	**0.1694**	**2.5840**	**0.6660**	**0.1621**	**0.8281**		**12,837.9559**	**12,837.9559**	**1.3402**		**12,871.4608**

3.4 Utility Installation - 2019

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	lb/day										lb/day					
Off-Road	0.1880	1.2382	1.3556	1.6000e-003		0.0738	0.0738		0.0679	0.0679		158.3305	158.3305	0.0501		159.5829
Total	**0.1880**	**1.2382**	**1.3556**	**1.6000e-003**		**0.0738**	**0.0738**		**0.0679**	**0.0679**		**158.3305**	**158.3305**	**0.0501**		**159.5829**

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	lb/day										lb/day					
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
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
Worker	0.0124	8.1100e-003	0.1070	3.4000e-004	0.0335	2.2000e-004	0.0338	8.8900e-003	2.1000e-004	9.1000e-003		33.7842	33.7842	8.3000e-004		33.8050
Total	**0.0124**	**8.1100e-003**	**0.1070**	**3.4000e-004**	**0.0335**	**2.2000e-004**	**0.0338**	**8.8900e-003**	**2.1000e-004**	**9.1000e-003**		**33.7842**	**33.7842**	**8.3000e-004**		**33.8050**

3.4 Utility Installation - 2019

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	lb/day										lb/day					
Off-Road	0.1880	1.2382	1.3556	1.6000e-003		0.0738	0.0738		0.0679	0.0679	0.0000	158.3305	158.3305	0.0501		159.5829
Total	**0.1880**	**1.2382**	**1.3556**	**1.6000e-003**		**0.0738**	**0.0738**		**0.0679**	**0.0679**	**0.0000**	**158.3305**	**158.3305**	**0.0501**		**159.5829**

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	lb/day										lb/day					
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
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
Worker	0.0124	8.1100e-003	0.1070	3.4000e-004	0.0309	2.2000e-004	0.0311	8.2500e-003	2.1000e-004	8.4600e-003		33.7842	33.7842	8.3000e-004		33.8050
Total	**0.0124**	**8.1100e-003**	**0.1070**	**3.4000e-004**	**0.0309**	**2.2000e-004**	**0.0311**	**8.2500e-003**	**2.1000e-004**	**8.4600e-003**		**33.7842**	**33.7842**	**8.3000e-004**		**33.8050**

3.5 Foundations - 2019

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	lb/day										lb/day					
Off-Road	2.7877	21.2802	15.8872	0.0357		1.0687	1.0687		1.0374	1.0374		3,314.6078	3,314.6078	0.4336		3,325.4472
Total	**2.7877**	**21.2802**	**15.8872**	**0.0357**		**1.0687**	**1.0687**		**1.0374**	**1.0374**		**3,314.6078**	**3,314.6078**	**0.4336**		**3,325.4472**

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	lb/day										lb/day					
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
Vendor	0.3637	11.0075	2.9098	0.0244	0.6198	0.0744	0.6942	0.1784	0.0711	0.2495		2,647.7980	2,647.7980	0.2235		2,653.3862
Worker	0.5111	0.3351	4.4236	0.0140	1.3860	9.2600e-003	1.3953	0.3676	8.5300e-003	0.3761		1,396.4140	1,396.4140	0.0343		1,397.2723
Total	**0.8747**	**11.3426**	**7.3334**	**0.0384**	**2.0058**	**0.0836**	**2.0894**	**0.5459**	**0.0797**	**0.6256**		**4,044.2120**	**4,044.2120**	**0.2579**		**4,050.6584**

3.5 Foundations - 2019

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	lb/day										lb/day					
Off-Road	2.7877	21.2802	15.8872	0.0357		1.0687	1.0687		1.0374	1.0374	0.0000	3,314.6078	3,314.6078	0.4336		3,325.4472
Total	**2.7877**	**21.2802**	**15.8872**	**0.0357**		**1.0687**	**1.0687**		**1.0374**	**1.0374**	**0.0000**	**3,314.6078**	**3,314.6078**	**0.4336**		**3,325.4472**

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	lb/day										lb/day					
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
Vendor	0.3637	11.0075	2.9098	0.0244	0.5800	0.0744	0.6543	0.1686	0.0711	0.2397		2,647.7980	2,647.7980	0.2235		2,653.3862
Worker	0.5111	0.3351	4.4236	0.0140	1.2776	9.2600e-003	1.2868	0.3410	8.5300e-003	0.3495		1,396.4140	1,396.4140	0.0343		1,397.2723
Total	**0.8747**	**11.3426**	**7.3334**	**0.0384**	**1.8576**	**0.0836**	**1.9412**	**0.5095**	**0.0797**	**0.5892**		**4,044.2120**	**4,044.2120**	**0.2579**		**4,050.6584**

3.6 Vertical Construction - 2019

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	lb/day										lb/day					
Off-Road	2.3301	16.4978	13.9198	0.0226		0.9559	0.9559		0.9215	0.9215		2,072.8548	2,072.8548	0.4053		2,082.9871
Total	**2.3301**	**16.4978**	**13.9198**	**0.0226**		**0.9559**	**0.9559**		**0.9215**	**0.9215**		**2,072.8548**	**2,072.8548**	**0.4053**		**2,082.9871**

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	lb/day										lb/day					
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
Vendor	0.1012	3.0640	0.8100	6.7800e-003	0.1725	0.0207	0.1932	0.0497	0.0198	0.0695		737.0159	737.0159	0.0622		738.5714
Worker	0.3297	0.2162	2.8539	9.0400e-003	0.8942	5.9700e-003	0.9002	0.2372	5.5000e-003	0.2427		900.9122	900.9122	0.0222		901.4660
Total	**0.4309**	**3.2801**	**3.6639**	**0.0158**	**1.0667**	**0.0267**	**1.0934**	**0.2868**	**0.0253**	**0.3121**		**1,637.9282**	**1,637.9282**	**0.0844**		**1,640.0374**

3.6 Vertical Construction - 2019

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	lb/day										lb/day					
Off-Road	2.3301	16.4978	13.9198	0.0226		0.9559	0.9559		0.9215	0.9215	0.0000	2,072.8548	2,072.8548	0.4053		2,082.9871
Total	**2.3301**	**16.4978**	**13.9198**	**0.0226**		**0.9559**	**0.9559**		**0.9215**	**0.9215**	**0.0000**	**2,072.8548**	**2,072.8548**	**0.4053**		**2,082.9871**

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	lb/day										lb/day					
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
Vendor	0.1012	3.0640	0.8100	6.7800e-003	0.1614	0.0207	0.1821	0.0469	0.0198	0.0667		737.0159	737.0159	0.0622		738.5714
Worker	0.3297	0.2162	2.8539	9.0400e-003	0.8243	5.9700e-003	0.8302	0.2200	5.5000e-003	0.2255		900.9122	900.9122	0.0222		901.4660
Total	**0.4309**	**3.2801**	**3.6639**	**0.0158**	**0.9857**	**0.0267**	**1.0124**	**0.2669**	**0.0253**	**0.2922**		**1,637.9282**	**1,637.9282**	**0.0844**		**1,640.0374**

3.6 Vertical 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	lb/day										lb/day					
Off-Road	2.0827	15.2584	13.6158	0.0226		0.8310	0.8310		0.8011	0.8011		2,054.7999	2,054.7999	0.3888		2,064.5208
Total	**2.0827**	**15.2584**	**13.6158**	**0.0226**		**0.8310**	**0.8310**		**0.8011**	**0.8011**		**2,054.7999**	**2,054.7999**	**0.3888**		**2,064.5208**

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	lb/day										lb/day					
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
Vendor	0.0863	2.8128	0.7424	6.7300e-003	0.1725	0.0147	0.1872	0.0496	0.0140	0.0637		732.0481	732.0481	0.0592		733.5283
Worker	0.3074	0.1937	2.6186	8.7500e-003	0.8942	5.9100e-003	0.9001	0.2372	5.4400e-003	0.2426		872.0349	872.0349	0.0199		872.5319
Total	**0.3937**	**3.0065**	**3.3610**	**0.0155**	**1.0667**	**0.0206**	**1.0873**	**0.2868**	**0.0195**	**0.3063**		**1,604.0830**	**1,604.0830**	**0.0791**		**1,606.0602**

3.6 Vertical Construction - 2020

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	lb/day										lb/day					
Off-Road	2.0827	15.2584	13.6158	0.0226		0.8310	0.8310		0.8011	0.8011	0.0000	2,054.7999	2,054.7999	0.3888		2,064.5208
Total	**2.0827**	**15.2584**	**13.6158**	**0.0226**		**0.8310**	**0.8310**		**0.8011**	**0.8011**	**0.0000**	**2,054.7999**	**2,054.7999**	**0.3888**		**2,064.5208**

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	lb/day										lb/day					
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
Vendor	0.0863	2.8128	0.7424	6.7300e-003	0.1614	0.0147	0.1761	0.0469	0.0140	0.0610		732.0481	732.0481	0.0592		733.5283
Worker	0.3074	0.1937	2.6186	8.7500e-003	0.8243	5.9100e-003	0.8302	0.2200	5.4400e-003	0.2254		872.0349	872.0349	0.0199		872.5319
Total	**0.3937**	**3.0065**	**3.3610**	**0.0155**	**0.9857**	**0.0206**	**1.0063**	**0.2669**	**0.0195**	**0.2864**		**1,604.0830**	**1,604.0830**	**0.0791**		**1,606.0602**

3.7 Interior/Exterior Coatings - 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	lb/day										lb/day					
Archit. Coating	9.6509					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479		375.2641	375.2641	0.0291		375.9904
Total	**9.9738**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**		**375.2641**	**375.2641**	**0.0291**		**375.9904**

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	lb/day										lb/day					
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
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
Worker	0.0961	0.0605	0.8183	2.7300e-003	0.2794	1.8500e-003	0.2813	0.0741	1.7000e-003	0.0758		272.5109	272.5109	6.2100e-003		272.6662
Total	**0.0961**	**0.0605**	**0.8183**	**2.7300e-003**	**0.2794**	**1.8500e-003**	**0.2813**	**0.0741**	**1.7000e-003**	**0.0758**		**272.5109**	**272.5109**	**6.2100e-003**		**272.6662**

3.7 Interior/Exterior Coatings - 2020

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	lb/day										lb/day					
Archit. Coating	9.6509					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479	0.0000	375.2641	375.2641	0.0291		375.9904
Total	**9.9738**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**	**0.0000**	**375.2641**	**375.2641**	**0.0291**		**375.9904**

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	lb/day										lb/day					
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
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
Worker	0.0961	0.0605	0.8183	2.7300e-003	0.2576	1.8500e-003	0.2594	0.0687	1.7000e-003	0.0704		272.5109	272.5109	6.2100e-003		272.6662
Total	**0.0961**	**0.0605**	**0.8183**	**2.7300e-003**	**0.2576**	**1.8500e-003**	**0.2594**	**0.0687**	**1.7000e-003**	**0.0704**		**272.5109**	**272.5109**	**6.2100e-003**		**272.6662**

3.8 Paving - 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	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328		1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8402**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**		**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

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	lb/day										lb/day					
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
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
Worker	0.0500	0.0315	0.4255	1.4200e-003	0.1453	9.6000e-004	0.1463	0.0385	8.8000e-004	0.0394		141.7057	141.7057	3.2300e-003		141.7864
Total	**0.0500**	**0.0315**	**0.4255**	**1.4200e-003**	**0.1453**	**9.6000e-004**	**0.1463**	**0.0385**	**8.8000e-004**	**0.0394**		**141.7057**	**141.7057**	**3.2300e-003**		**141.7864**

3.8 Paving - 2020

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	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328	0.0000	1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8402**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**	**0.0000**	**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

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	lb/day										lb/day					
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
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
Worker	0.0500	0.0315	0.4255	1.4200e-003	0.1339	9.6000e-004	0.1349	0.0358	8.8000e-004	0.0366		141.7057	141.7057	3.2300e-003		141.7864
Total	**0.0500**	**0.0315**	**0.4255**	**1.4200e-003**	**0.1339**	**9.6000e-004**	**0.1349**	**0.0358**	**8.8000e-004**	**0.0366**		**141.7057**	**141.7057**	**3.2300e-003**		**141.7864**

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	lb/day										lb/day					
Mitigated	1.0419	1.6291	15.2461	0.0514	5.2519	0.0370	5.2889	1.3933	0.0342	1.4275		5,133.3922	5,133.3922	0.1509		5,137.1640
Unmitigated	1.0419	1.6291	15.2461	0.0514	5.2519	0.0370	5.2889	1.3933	0.0342	1.4275		5,133.3922	5,133.3922	0.1509		5,137.1640

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	652.80	589.20	490.80	2,388,630	2,388,630
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Total	652.80	589.20	490.80	2,388,630	2,388,630

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
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	100	0	0
Unenclosed Parking with	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.661670	0.052185	0.250353	0.020000	0.002631	0.000909	0.003924	0.002536	0.000000	0.000000	0.005792	0.000000	0.000000
Unenclosed Parking with Elevator	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

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	lb/day										lb/day					
NaturalGas Mitigated	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
NaturalGas Unmitigated	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234

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	lb/day										lb/day					
Apartments Mid Rise	3756.97	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
Unenclosed 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
Total		**0.0405**	**0.3462**	**0.1473**	**2.2100e-003**		**0.0280**	**0.0280**		**0.0280**	**0.0280**		**441.9968**	**441.9968**	**8.4700e-003**	**8.1000e-003**	**444.6234**

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	lb/day										lb/day					
Apartments Mid Rise	3.75697	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
Unenclosed 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
Total		**0.0405**	**0.3462**	**0.1473**	**2.2100e-003**		**0.0280**	**0.0280**		**0.0280**	**0.0280**		**441.9968**	**441.9968**	**8.4700e-003**	**8.1000e-003**	**444.6234**

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	lb/day										lb/day					
Mitigated	1.6172	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547	0.0000	17.8457	17.8457	0.0174	0.0000	18.2816
Unmitigated	1.6172	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547	0.0000	17.8457	17.8457	0.0174	0.0000	18.2816

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	lb/day										lb/day					
Architectural Coating	0.1084					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.3033	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547		17.8457	17.8457	0.0174		18.2816
Total	**1.6172**	**0.1150**	**9.9422**	**5.2000e-004**		**0.0547**	**0.0547**		**0.0547**	**0.0547**	**0.0000**	**17.8457**	**17.8457**	**0.0174**	**0.0000**	**18.2816**

6.2 Area by SubCategory

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	lb/day										lb/day					
Architectural Coating	0.1084					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.3033	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547		17.8457	17.8457	0.0174		18.2816
Total	**1.6172**	**0.1150**	**9.9422**	**5.2000e-004**		**0.0547**	**0.0547**		**0.0547**	**0.0547**	**0.0000**	**17.8457**	**17.8457**	**0.0174**	**0.0000**	**18.2816**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

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

City of Brea - Mercury Residential Project

Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unenclosed Parking with Elevator	88.75	1000sqft	0.00	88,753.00	0
Apartments Mid Rise	120.00	Dwelling Unit	1.01	59,292.00	343

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Refer to project description.

Construction Phase - Based on construction phasing.

Off-road Equipment - Refer to construction equipment list.

Off-road Equipment - Refer to constuction equipment list.

Off-road Equipment - Refer to constuction equipment list.

Off-road Equipment - Refer to construction equipment list.

Off-road Equipment - Refer to construction equipment list soil export of 25,000 cubic yrds.

Off-road Equipment - Refer to construction equipment list.

Off-road Equipment - Refer to constuction equipment list.

Trips and VMT - Refer to construction CalEEMod Inputs.

Grading - Refer to land use description.

Architectural Coating -

Vehicle Trips - Refer to trip generation rates.

Woodstoves - Refer to project desciption.

Water And Wastewater - No septic or lagoons use. Refer to water demand CalEEMod Inputs.

Solid Waste - Refer to solid waste generation - CalEEMod Input.

Construction Off-road Equipment Mitigation - SCAQMD Rull 403 and 1186.

Fleet Mix - Refer to fleet mix CalEEMod Inputs.

Stationary Sources - Emergency Generators and Fire Pumps -

Stationary Sources - Process Boilers -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	10.00	41.00
tblConstructionPhase	NumDays	200.00	82.00

City of Brea - Mercury Residential Project - Orange County, Winter

tblConstructionPhase	NumDays	200.00	182.00
tblConstructionPhase	NumDays	10.00	11.00
tblConstructionPhase	NumDays	2.00	31.00
tblConstructionPhase	NumDays	2.00	12.00
tblFireplaces	NumberGas	102.00	0.00
tblFireplaces	NumberNoFireplace	12.00	0.00
tblFireplaces	NumberWood	6.00	0.00
tblFleetMix	HHD	0.02	2.5358e-003
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.56	0.66
tblFleetMix	LDA	0.56	0.00
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.21	0.25
tblFleetMix	LDT2	0.21	0.00
tblFleetMix	LHD1	0.02	2.6307e-003
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.7950e-003	9.0933e-004
tblFleetMix	LHD2	5.7950e-003	0.00
tblFleetMix	MCY	4.8670e-003	5.7923e-003
tblFleetMix	MCY	4.8670e-003	0.00
tblFleetMix	MDV	0.12	0.02
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	1.0020e-003	0.00
tblFleetMix	MH	1.0020e-003	0.00
tblFleetMix	MHD	0.03	3.9242e-003
tblFleetMix	MHD	0.03	0.00

tblFleetMix	OBUS	1.6770e-003	0.00
tblFleetMix	OBUS	1.6770e-003	0.00
tblFleetMix	SBUS	5.8600e-004	0.00
tblFleetMix	SBUS	5.8600e-004	0.00
tblFleetMix	UBUS	1.5860e-003	0.00
tblFleetMix	UBUS	1.5860e-003	0.00
tblGrading	AcresOfGrading	15.50	0.00
tblGrading	AcresOfGrading	0.00	1.01
tblGrading	MaterialExported	0.00	25,000.00
tblLandUse	LandUseSquareFeet	88,750.00	88,753.00
tblLandUse	LandUseSquareFeet	120,000.00	59,292.00
tblLandUse	LotAcreage	2.04	0.00
tblLandUse	LotAcreage	3.16	1.01
tblOffRoadEquipment	HorsePower	89.00	99.00
tblOffRoadEquipment	HorsePower	247.00	412.00
tblOffRoadEquipment	HorsePower	158.00	235.00
tblOffRoadEquipment	HorsePower	158.00	44.00
tblOffRoadEquipment	HorsePower	84.00	231.00
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.74	0.56
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblSolidWaste	SolidWasteGenerationRate	55.20	188.00
tblTripsAndVMT	HaulingTripNumber	3,125.00	1,786.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	27.00	97.00
tblTripsAndVMT	WorkerTripNumber	10.00	5.00
tblTripsAndVMT	WorkerTripNumber	124.00	80.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	6.39	4.91
tblVehicleTrips	SU_TR	5.86	4.09
tblVehicleTrips	WD_TR	6.65	5.44
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	7,818,483.07	27,159,602.00
tblWater	OutdoorWaterUseRate	4,929,043.68	166,184.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	6.00	0.00
tblWoodstoves	NumberNoncatalytic	6.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2019	3.9985	75.5211	31.2690	0.1472	9.0073	1.4798	10.4870	4.0835	1.3678	5.4514	0.0000	15,964.2772	15,964.2772	2.3964	0.0000	16,024.1884
2020	10.0823	18.2831	16.8498	0.0374	1.0667	0.8518	1.9185	0.2868	0.8208	1.1076	0.0000	3,594.1551	3,594.1551	0.4699	0.0000	3,605.9017
Maximum	**10.0823**	**75.5211**	**31.2690**	**0.1472**	**9.0073**	**1.4798**	**10.4870**	**4.0835**	**1.3678**	**5.4514**	**0.0000**	**15,964.2772**	**15,964.2772**	**2.3964**	**0.0000**	**16,024.1884**

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	lb/day										lb/day					
2019	3.9985	75.5211	31.2690	0.1472	5.1913	1.4798	6.6711	2.1177	1.3678	3.4856	0.0000	15,964.2772	15,964.2772	2.3964	0.0000	16,024.1884
2020	10.0823	18.2831	16.8498	0.0374	0.9857	0.8518	1.8375	0.2669	0.8208	1.0877	0.0000	3,594.1551	3,594.1551	0.4699	0.0000	3,605.9016
Maximum	**10.0823**	**75.5211**	**31.2690**	**0.1472**	**5.1913**	**1.4798**	**6.6711**	**2.1177**	**1.3678**	**3.4856**	**0.0000**	**15,964.2772**	**15,964.2772**	**2.3964**	**0.0000**	**16,024.1884**

	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**	**38.68**	**0.00**	**31.41**	**45.44**	**0.00**	**30.27**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	lb/day										lb/day					
Area	1.6172	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547	0.0000	17.8457	17.8457	0.0174	0.0000	18.2816
Energy	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
Mobile	1.0207	1.7415	14.3951	0.0487	5.2519	0.0370	5.2889	1.3933	0.0343	1.4276		4,866.5343	4,866.5343	0.1475		4,870.2212
Total	**2.6784**	**2.2027**	**24.4846**	**0.0514**	**5.2519**	**0.1197**	**5.3716**	**1.3933**	**0.1169**	**1.5102**	**0.0000**	**5,326.3768**	**5,326.3768**	**0.1734**	**8.1000e-003**	**5,333.1262**

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	lb/day										lb/day					
Area	1.6172	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547	0.0000	17.8457	17.8457	0.0174	0.0000	18.2816
Energy	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
Mobile	1.0207	1.7415	14.3951	0.0487	5.2519	0.0370	5.2889	1.3933	0.0343	1.4276		4,866.5343	4,866.5343	0.1475		4,870.2212
Total	**2.6784**	**2.2027**	**24.4846**	**0.0514**	**5.2519**	**0.1197**	**5.3716**	**1.3933**	**0.1169**	**1.5102**	**0.0000**	**5,326.3768**	**5,326.3768**	**0.1734**	**8.1000e-003**	**5,333.1262**

	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	Excavation/Shoring	Site Preparation	2/1/2019	3/15/2019	5	31	
2	Soil Export	Site Preparation	2/1/2019	2/18/2019	5	12	
3	Utility Installation	Trenching	3/16/2019	4/12/2019	5	20	
4	Foundations	Building Construction	4/16/2019	8/7/2019	5	82	
5	Vertical Construction	Building Construction	8/15/2019	4/25/2020	5	182	
6	Interior/Exterior Coatings	Architectural Coating	5/15/2020	7/10/2020	5	41	
7	Paving	Paving	7/15/2020	7/29/2020	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 120,066; Residential Outdoor: 40,022; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 5,325 (Architectural Coating – sqft)

OffRoad Equipment

City of Brea - Mercury Residential Project - Orange County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Excavation/Shoring	Excavators	1	8.00	235	0.41
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Excavation/Shoring	Rubber Tired Dozers	1	8.00	412	0.40
Foundations	Cranes	1	6.00	231	0.29
Soil Export	Graders	0	0.00	187	0.41
Soil Export	Rubber Tired Dozers	0	0.00	247	0.40
Soil Export	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Utility Installation	Excavators	1	8.00	44	0.38
Vertical Construction	Cranes	1	6.00	231	0.29
Foundations	Forklifts	1	6.00	89	0.20
Foundations	Generator Sets	1	8.00	84	0.74
Foundations	Pumps	1	8.00	231	0.56
Vertical Construction	Generator Sets	1	8.00	84	0.74
Excavation/Shoring	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Vertical Construction	Forklifts	1	8.00	99	0.20
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Foundations	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Interior/Exterior Coatings	Air Compressors	1	8.00	78	0.48
Vertical Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Excavation/Shoring	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Foundations	Welders	3	8.00	46	0.45
Vertical Construction	Welders	3	8.00	46	0.45

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
Excavation/Shoring	4	5.00	2.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Soil Export	0	0.00	0.00	1,786.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Utility Installation	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Foundations	8	124.00	97.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Vertical Construction	7	80.00	27.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Interior/Exterior Coatings	1	25.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Excavation/Shoring - 2019

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	lb/day										lb/day					
Fugitive Dust					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102			0.0000			0.0000
Off-Road	2.6978	30.5827	19.8415	0.0324		1.3047	1.3047		1.2003	1.2003		3,210.0028	3,210.0028	1.0156		3,235.3931
Total	**2.6978**	**30.5827**	**19.8415**	**0.0324**	**6.0221**	**1.3047**	**7.3268**	**3.3102**	**1.2003**	**4.5106**		**3,210.0028**	**3,210.0028**	**1.0156**		**3,235.3931**

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	lb/day										lb/day					
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
Vendor	7.8200e-003	0.2272	0.0659	4.9000e-004	0.0128	1.5600e-003	0.0143	3.6800e-003	1.4900e-003	5.1700e-003		53.2710	53.2710	4.8500e-003		53.3923
Worker	0.0233	0.0149	0.1651	5.3000e-004	0.0559	3.7000e-004	0.0563	0.0148	3.4000e-004	0.0152		53.2887	53.2887	1.3100e-003		53.3215
Total	**0.0311**	**0.2421**	**0.2310**	**1.0200e-003**	**0.0687**	**1.9300e-003**	**0.0706**	**0.0185**	**1.8300e-003**	**0.0203**		**106.5597**	**106.5597**	**6.1600e-003**		**106.7138**

3.2 Excavation/Shoring - 2019

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	lb/day										lb/day					
Fugitive Dust					2.5744	0.0000	2.5744	1.4151	0.0000	1.4151			0.0000			0.0000
Off-Road	2.6978	30.5827	19.8415	0.0324		1.3047	1.3047		1.2003	1.2003	0.0000	3,210.0028	3,210.0028	1.0156		3,235.3931
Total	**2.6978**	**30.5827**	**19.8415**	**0.0324**	**2.5744**	**1.3047**	**3.8791**	**1.4151**	**1.2003**	**2.6155**	**0.0000**	**3,210.0028**	**3,210.0028**	**1.0156**		**3,235.3931**

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	lb/day										lb/day					
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
Vendor	7.8200e-003	0.2272	0.0659	4.9000e-004	0.0120	1.5600e-003	0.0135	3.4800e-003	1.4900e-003	4.9700e-003		53.2710	53.2710	4.8500e-003		53.3923
Worker	0.0233	0.0149	0.1651	5.3000e-004	0.0515	3.7000e-004	0.0519	0.0138	3.4000e-004	0.0141		53.2887	53.2887	1.3100e-003		53.3215
Total	**0.0311**	**0.2421**	**0.2310**	**1.0200e-003**	**0.0635**	**1.9300e-003**	**0.0654**	**0.0172**	**1.8300e-003**	**0.0191**		**106.5597**	**106.5597**	**6.1600e-003**		**106.7138**

3.3 Soil Export - 2019

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	lb/day										lb/day					
Fugitive Dust					0.3249	0.0000	0.3249	0.0453	0.0000	0.0453			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.3249**	**0.0000**	**0.3249**	**0.0453**	**0.0000**	**0.0453**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

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	lb/day										lb/day					
Hauling	1.2696	44.6964	11.1965	0.1138	2.5916	0.1732	2.7648	0.7095	0.1657	0.8751		12,647.7147	12,647.7147	1.3747		12,682.0815
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
Worker	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
Total	**1.2696**	**44.6964**	**11.1965**	**0.1138**	**2.5916**	**0.1732**	**2.7648**	**0.7095**	**0.1657**	**0.8751**		**12,647.7147**	**12,647.7147**	**1.3747**		**12,682.0815**

3.3 Soil Export - 2019

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	lb/day										lb/day					
Fugitive Dust					0.1389	0.0000	0.1389	0.0194	0.0000	0.0194			0.0000			0.0000
Off-Road	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
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.1389**	**0.0000**	**0.1389**	**0.0194**	**0.0000**	**0.0194**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

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	lb/day										lb/day					
Hauling	1.2696	44.6964	11.1965	0.1138	2.4145	0.1732	2.5877	0.6660	0.1657	0.8317		12,647.7147	12,647.7147	1.3747		12,682.0815
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
Worker	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
Total	**1.2696**	**44.6964**	**11.1965**	**0.1138**	**2.4145**	**0.1732**	**2.5877**	**0.6660**	**0.1657**	**0.8317**		**12,647.7147**	**12,647.7147**	**1.3747**		**12,682.0815**

3.4 Utility Installation - 2019

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	lb/day										lb/day					
Off-Road	0.1880	1.2382	1.3556	1.6000e-003		0.0738	0.0738		0.0679	0.0679		158.3305	158.3305	0.0501		159.5829
Total	**0.1880**	**1.2382**	**1.3556**	**1.6000e-003**		**0.0738**	**0.0738**		**0.0679**	**0.0679**		**158.3305**	**158.3305**	**0.0501**		**159.5829**

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	lb/day										lb/day					
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
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
Worker	0.0140	8.9100e-003	0.0991	3.2000e-004	0.0335	2.2000e-004	0.0338	8.8900e-003	2.1000e-004	9.1000e-003		31.9732	31.9732	7.9000e-004		31.9929
Total	**0.0140**	**8.9100e-003**	**0.0991**	**3.2000e-004**	**0.0335**	**2.2000e-004**	**0.0338**	**8.8900e-003**	**2.1000e-004**	**9.1000e-003**		**31.9732**	**31.9732**	**7.9000e-004**		**31.9929**

3.4 Utility Installation - 2019

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	lb/day										lb/day					
Off-Road	0.1880	1.2382	1.3556	1.6000e-003		0.0738	0.0738		0.0679	0.0679	0.0000	158.3305	158.3305	0.0501		159.5829
Total	**0.1880**	**1.2382**	**1.3556**	**1.6000e-003**		**0.0738**	**0.0738**		**0.0679**	**0.0679**	**0.0000**	**158.3305**	**158.3305**	**0.0501**		**159.5829**

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	lb/day										lb/day					
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
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
Worker	0.0140	8.9100e-003	0.0991	3.2000e-004	0.0309	2.2000e-004	0.0311	8.2500e-003	2.1000e-004	8.4600e-003		31.9732	31.9732	7.9000e-004		31.9929
Total	**0.0140**	**8.9100e-003**	**0.0991**	**3.2000e-004**	**0.0309**	**2.2000e-004**	**0.0311**	**8.2500e-003**	**2.1000e-004**	**8.4600e-003**		**31.9732**	**31.9732**	**7.9000e-004**		**31.9929**

3.5 Foundations - 2019

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	lb/day										lb/day					
Off-Road	2.7877	21.2802	15.8872	0.0357		1.0687	1.0687		1.0374	1.0374		3,314.6078	3,314.6078	0.4336		3,325.4472
Total	**2.7877**	**21.2802**	**15.8872**	**0.0357**		**1.0687**	**1.0687**		**1.0374**	**1.0374**		**3,314.6078**	**3,314.6078**	**0.4336**		**3,325.4472**

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	lb/day										lb/day					
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
Vendor	0.3792	11.0191	3.1948	0.0238	0.6198	0.0758	0.6955	0.1784	0.0725	0.2508		2,583.6448	2,583.6448	0.2353		2,589.5277
Worker	0.5765	0.3683	4.0955	0.0133	1.3860	9.2600e-003	1.3953	0.3676	8.5300e-003	0.3761		1,321.5594	1,321.5594	0.0326		1,322.3734
Total	**0.9557**	**11.3874**	**7.2903**	**0.0371**	**2.0058**	**0.0850**	**2.0908**	**0.5459**	**0.0810**	**0.6269**		**3,905.2042**	**3,905.2042**	**0.2679**		**3,911.9010**

3.5 Foundations - 2019

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	lb/day										lb/day					
Off-Road	2.7877	21.2802	15.8872	0.0357		1.0687	1.0687		1.0374	1.0374	0.0000	3,314.6078	3,314.6078	0.4336		3,325.4472
Total	**2.7877**	**21.2802**	**15.8872**	**0.0357**		**1.0687**	**1.0687**		**1.0374**	**1.0374**	**0.0000**	**3,314.6078**	**3,314.6078**	**0.4336**		**3,325.4472**

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	lb/day										lb/day					
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
Vendor	0.3792	11.0191	3.1948	0.0238	0.5800	0.0758	0.6557	0.1686	0.0725	0.2411		2,583.6448	2,583.6448	0.2353		2,589.5277
Worker	0.5765	0.3683	4.0955	0.0133	1.2776	9.2600e-003	1.2868	0.3410	8.5300e-003	0.3495		1,321.5594	1,321.5594	0.0326		1,322.3734
Total	**0.9557**	**11.3874**	**7.2903**	**0.0371**	**1.8576**	**0.0850**	**1.9426**	**0.5095**	**0.0810**	**0.5905**		**3,905.2042**	**3,905.2042**	**0.2679**		**3,911.9010**

3.6 Vertical Construction - 2019

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	lb/day										lb/day					
Off-Road	2.3301	16.4978	13.9198	0.0226		0.9559	0.9559		0.9215	0.9215		2,072.8548	2,072.8548	0.4053		2,082.9871
Total	**2.3301**	**16.4978**	**13.9198**	**0.0226**		**0.9559**	**0.9559**		**0.9215**	**0.9215**		**2,072.8548**	**2,072.8548**	**0.4053**		**2,082.9871**

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	lb/day										lb/day					
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
Vendor	0.1056	3.0672	0.8893	6.6200e-003	0.1725	0.0211	0.1936	0.0497	0.0202	0.0698		719.1589	719.1589	0.0655		720.7964
Worker	0.3720	0.2376	2.6422	8.5500e-003	0.8942	5.9700e-003	0.9002	0.2372	5.5000e-003	0.2427		852.6190	852.6190	0.0210		853.1441
Total	**0.4775**	**3.3048**	**3.5315**	**0.0152**	**1.0667**	**0.0271**	**1.0938**	**0.2868**	**0.0257**	**0.3125**		**1,571.7778**	**1,571.7778**	**0.0865**		**1,573.9405**

3.6 Vertical Construction - 2019

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	lb/day										lb/day					
Off-Road	2.3301	16.4978	13.9198	0.0226		0.9559	0.9559		0.9215	0.9215	0.0000	2,072.8548	2,072.8548	0.4053		2,082.9871
Total	**2.3301**	**16.4978**	**13.9198**	**0.0226**		**0.9559**	**0.9559**		**0.9215**	**0.9215**	**0.0000**	**2,072.8548**	**2,072.8548**	**0.4053**		**2,082.9871**

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	lb/day										lb/day					
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
Vendor	0.1056	3.0672	0.8893	6.6200e-003	0.1614	0.0211	0.1825	0.0469	0.0202	0.0671		719.1589	719.1589	0.0655		720.7964
Worker	0.3720	0.2376	2.6422	8.5500e-003	0.8243	5.9700e-003	0.8302	0.2200	5.5000e-003	0.2255		852.6190	852.6190	0.0210		853.1441
Total	**0.4775**	**3.3048**	**3.5315**	**0.0152**	**0.9857**	**0.0271**	**1.0127**	**0.2669**	**0.0257**	**0.2926**		**1,571.7778**	**1,571.7778**	**0.0865**		**1,573.9405**

3.6 Vertical 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	lb/day										lb/day					
Off-Road	2.0827	15.2584	13.6158	0.0226		0.8310	0.8310		0.8011	0.8011		2,054.7999	2,054.7999	0.3888		2,064.5208
Total	**2.0827**	**15.2584**	**13.6158**	**0.0226**		**0.8310**	**0.8310**		**0.8011**	**0.8011**		**2,054.7999**	**2,054.7999**	**0.3888**		**2,064.5208**

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	lb/day										lb/day					
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
Vendor	0.0901	2.8119	0.8137	6.5600e-003	0.1725	0.0149	0.1874	0.0496	0.0143	0.0639		714.0583	714.0583	0.0622		715.6132
Worker	0.3474	0.2129	2.4203	8.2800e-003	0.8942	5.9100e-003	0.9001	0.2372	5.4400e-003	0.2426		825.2969	825.2969	0.0188		825.7677
Total	**0.4375**	**3.0247**	**3.2340**	**0.0148**	**1.0667**	**0.0208**	**1.0876**	**0.2868**	**0.0197**	**0.3065**		**1,539.3552**	**1,539.3552**	**0.0810**		**1,541.3808**

3.6 Vertical Construction - 2020

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	lb/day										lb/day					
Off-Road	2.0827	15.2584	13.6158	0.0226		0.8310	0.8310		0.8011	0.8011	0.0000	2,054.7999	2,054.7999	0.3888		2,064.5208
Total	**2.0827**	**15.2584**	**13.6158**	**0.0226**		**0.8310**	**0.8310**		**0.8011**	**0.8011**	**0.0000**	**2,054.7999**	**2,054.7999**	**0.3888**		**2,064.5208**

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	lb/day										lb/day					
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
Vendor	0.0901	2.8119	0.8137	6.5600e-003	0.1614	0.0149	0.1764	0.0469	0.0143	0.0612		714.0583	714.0583	0.0622		715.6132
Worker	0.3474	0.2129	2.4203	8.2800e-003	0.8243	5.9100e-003	0.8302	0.2200	5.4400e-003	0.2254		825.2969	825.2969	0.0188		825.7677
Total	**0.4375**	**3.0247**	**3.2340**	**0.0148**	**0.9857**	**0.0208**	**1.0065**	**0.2669**	**0.0197**	**0.2866**		**1,539.3552**	**1,539.3552**	**0.0810**		**1,541.3808**

3.7 Interior/Exterior Coatings - 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	lb/day										lb/day					
Archit. Coating	9.6509					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479		375.2641	375.2641	0.0291		375.9904
Total	**9.9738**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**		**375.2641**	**375.2641**	**0.0291**		**375.9904**

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	lb/day										lb/day					
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
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
Worker	0.1086	0.0665	0.7563	2.5900e-003	0.2794	1.8500e-003	0.2813	0.0741	1.7000e-003	0.0758		257.9053	257.9053	5.8800e-003		258.0524
Total	**0.1086**	**0.0665**	**0.7563**	**2.5900e-003**	**0.2794**	**1.8500e-003**	**0.2813**	**0.0741**	**1.7000e-003**	**0.0758**		**257.9053**	**257.9053**	**5.8800e-003**		**258.0524**

3.7 Interior/Exterior Coatings - 2020

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	lb/day										lb/day					
Archit. Coating	9.6509					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479	0.0000	375.2641	375.2641	0.0291		375.9904
Total	**9.9738**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**	**0.0000**	**375.2641**	**375.2641**	**0.0291**		**375.9904**

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	lb/day										lb/day					
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
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
Worker	0.1086	0.0665	0.7563	2.5900e-003	0.2576	1.8500e-003	0.2594	0.0687	1.7000e-003	0.0704		257.9053	257.9053	5.8800e-003		258.0524
Total	**0.1086**	**0.0665**	**0.7563**	**2.5900e-003**	**0.2576**	**1.8500e-003**	**0.2594**	**0.0687**	**1.7000e-003**	**0.0704**		**257.9053**	**257.9053**	**5.8800e-003**		**258.0524**

3.8 Paving - 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	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328		1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8402**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**		**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

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	lb/day										lb/day					
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
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
Worker	0.0565	0.0346	0.3933	1.3400e-003	0.1453	9.6000e-004	0.1463	0.0385	8.8000e-004	0.0394		134.1108	134.1108	3.0600e-003		134.1873
Total	**0.0565**	**0.0346**	**0.3933**	**1.3400e-003**	**0.1453**	**9.6000e-004**	**0.1463**	**0.0385**	**8.8000e-004**	**0.0394**		**134.1108**	**134.1108**	**3.0600e-003**		**134.1873**

3.8 Paving - 2020

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	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328	0.0000	1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8402**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**	**0.0000**	**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

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	lb/day										lb/day					
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
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
Worker	0.0565	0.0346	0.3933	1.3400e-003	0.1339	9.6000e-004	0.1349	0.0358	8.8000e-004	0.0366		134.1108	134.1108	3.0600e-003		134.1873
Total	**0.0565**	**0.0346**	**0.3933**	**1.3400e-003**	**0.1339**	**9.6000e-004**	**0.1349**	**0.0358**	**8.8000e-004**	**0.0366**		**134.1108**	**134.1108**	**3.0600e-003**		**134.1873**

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	lb/day										lb/day					
Mitigated	1.0207	1.7415	14.3951	0.0487	5.2519	0.0370	5.2889	1.3933	0.0343	1.4276		4,866.5343	4,866.5343	0.1475		4,870.2212
Unmitigated	1.0207	1.7415	14.3951	0.0487	5.2519	0.0370	5.2889	1.3933	0.0343	1.4276		4,866.5343	4,866.5343	0.1475		4,870.2212

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	652.80	589.20	490.80	2,388,630	2,388,630
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Total	652.80	589.20	490.80	2,388,630	2,388,630

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
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	100	0	0
Unenclosed Parking with	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.661670	0.052185	0.250353	0.020000	0.002631	0.000909	0.003924	0.002536	0.000000	0.000000	0.005792	0.000000	0.000000
Unenclosed Parking with Elevator	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

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	lb/day										lb/day					
NaturalGas Mitigated	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
NaturalGas Unmitigated	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234

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	lb/day										lb/day					
Apartments Mid Rise	3756.97	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
Unenclosed 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
Total		**0.0405**	**0.3462**	**0.1473**	**2.2100e-003**		**0.0280**	**0.0280**		**0.0280**	**0.0280**		**441.9968**	**441.9968**	**8.4700e-003**	**8.1000e-003**	**444.6234**

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	lb/day										lb/day					
Apartments Mid Rise	3.75697	0.0405	0.3462	0.1473	2.2100e-003		0.0280	0.0280		0.0280	0.0280		441.9968	441.9968	8.4700e-003	8.1000e-003	444.6234
Unenclosed 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
Total		**0.0405**	**0.3462**	**0.1473**	**2.2100e-003**		**0.0280**	**0.0280**		**0.0280**	**0.0280**		**441.9968**	**441.9968**	**8.4700e-003**	**8.1000e-003**	**444.6234**

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	lb/day										lb/day					
Mitigated	1.6172	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547	0.0000	17.8457	17.8457	0.0174	0.0000	18.2816
Unmitigated	1.6172	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547	0.0000	17.8457	17.8457	0.0174	0.0000	18.2816

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	lb/day										lb/day					
Architectural Coating	0.1084					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.3033	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547		17.8457	17.8457	0.0174		18.2816
Total	**1.6172**	**0.1150**	**9.9422**	**5.2000e-004**		**0.0547**	**0.0547**		**0.0547**	**0.0547**	**0.0000**	**17.8457**	**17.8457**	**0.0174**	**0.0000**	**18.2816**

6.2 Area by SubCategory

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	lb/day										lb/day					
Architectural Coating	0.1084					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.3033	0.1150	9.9422	5.2000e-004		0.0547	0.0547		0.0547	0.0547		17.8457	17.8457	0.0174		18.2816
Total	**1.6172**	**0.1150**	**9.9422**	**5.2000e-004**		**0.0547**	**0.0547**		**0.0547**	**0.0547**	**0.0000**	**17.8457**	**17.8457**	**0.0174**	**0.0000**	**18.2816**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

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

Construction Localized Significance Thresholds: Excavation/Shoring + Soil Export - Non-Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	25	82

Source Receptor Distance (meters)	North Orange County 25	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
NOx	**103.44**	Tractors	0.5	0.0625	0	0	0
CO	**524.36**	Graders	0.5	0.0625	0	0	0
		Dozers	0.5	0.0625	8	1	0.5
		Scrapers	1	0.125	0	0	0
						Acres	0.50

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Excavation/Shoring + Soil Export - Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	218	715

Source Receptor Distance (meters)	North Orange County 218	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
		Tractors	0.5	0.0625	0	0	0
		Graders	0.5	0.0625	0	0	0
		Dozers	0.5	0.0625	8	1	0.5
PM10	**58.09**	Scrapers	1	0.125	0	0	0
PM2.5	**23.27**					**Acres**	0.50

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
200			
Distance Increment Above			
500			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Utility Trenching - Non-Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	25	82

Source Receptor Distance (meters)	North Orange County 25	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
NOx	**103.44**	Tractors	0.5	0.0625	0	0	0
CO	**524.36**	Graders	0.5	0.0625	0	0	0
		Dozers	0.5	0.0625	0	0	0
		Scrapers	1	0.125	0	0	0
						Acres	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Utility Trenching - Sensitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	218	715

Source Receptor Distance (meters)	North Orange County 218	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
		Tractors	0.5	0.0625	0	0	0
		Graders	0.5	0.0625	0	0	0
		Dozers	0.5	0.0625	0	0	0
PM10	**58.09**	Scrapers	1	0.125	0	0	0
PM2.5	**23.27**					**Acres**	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
200			
Distance Increment Above			
500			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Foundation - Non-Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	25	82

Source Receptor	North Orange County	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
Distance (meters)	25	Tractors	0.5	0.0625	0	0	0
NOx	**103**	Graders	0.5	0.0625	0	0	0
CO	**524**	Dozers	0.5	0.0625	0	0	0
		Scrapers	1	0.125	0	0	0
						Acres	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Foundation - Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	218	715

Source Receptor	North Orange County	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
Distance (meters)	218	Tractors	0.5	0.0625	0	0	0
		Graders	0.5	0.0625	0	0	0
		Dozers	0.5	0.0625	0	0	0
PM10	**58.09**	Scrapers	1	0.125	0	0	0
PM2.5	**23.27**					**Acres**	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
200			
Distance Increment Above			
500			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Vertical Construction - Non-Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	25	82

Source Receptor	North Orange County	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
Distance (meters)	25	Tractors	0.5	0.0625	0	0	0
NOx	**103.44**	Graders	0.5	0.0625	0	0	0
CO	**524.36**	Dozers	0.5	0.0625	0	0	0
		Scrapers	1	0.125	0	0	0
						Acres	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Vertical Construction - Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	218	715

Source Receptor Distance (meters)	North Orange County 218	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
		Tractors	0.5	0.0625	0	0	0
		Graders	0.5	0.0625	0	0	0
		Dozers	0.5	0.0625	0	0	0
PM10	**58.09**	Scrapers	1	0.125	0	0	0
PM2.5	**23.27**					**Acres**	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
200			
Distance Increment Above			
500			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Foundation + Vertical Construction + Paving + Architectural Coating - Non-Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	25	82

Source Receptor	North Orange County	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
Distance (meters)	25	Tractors	0.5	0.0625	0	0	0
NOx	**103.44**	Graders	0.5	0.0625	0	0	0
CO	**524.36**	Dozers	0.5	0.0625	0	0	0
		Scrapers	1	0.125	0	0	0
						Acres	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Foundation + Vertical Construction + Paving + Architectural Coating - Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	218	715

Source Receptor Distance (meters)	North Orange County 218	Equipment	Acres/8-hr Day		Daily hours	Equipment Used	Acres
		Tractors	0.5	0.0625	0	0	0
		Graders	0.5	0.0625	0	0	0
		Dozers	0.5	0.0625	0	0	0
PM10	**58.09**	Scrapers	1	0.125	0	0	0
PM2.5	**23.27**					**Acres**	0.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	4	10	24	53	137
	2	6	17	31	60	145
		4	10	24	53	137
PM2.5	1	3	4	9	20	74
	2	4	6	11	24	79
		3	4	9	20	74

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	4	10	24	53	137
PM2.5	3	4	9	20	74

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
200			
Distance Increment Above			
500			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Operation Localized Significance Thresholds - Non-Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	25	82

Source Receptor **North Orange County**
Distance (meters) 25
NOx **103.44**
CO **524.36**

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	1	3	6	13	33
	2	2	4	8	15	35
		1	3	6	13	33
PM2.5	1	1	1	3	5	18
	2	1	2	3	6	19
		1	1	3	5	18

North Orange County
1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	1	3	6	13	33
PM2.5	1	1	3	5	18

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2010 - Table C-1. 2006 – 2008

Operation Localized Significance Thresholds - Sesitive Receptor

SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)
16	1.01	218	715

Source Receptor **North Orange County**
Distance (meters) 218

PM10 **14.22**
PM2.5 **5.78**

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	103	104	121	159	252
	2	147	143	156	186	269
		103	104	121	159	252
CO	1	522	685	1014	1975	6531
	2	762	1010	1395	2444	7121
		524	688	1018	1980	6537
PM10	1	1	3	6	13	33
	2	2	4	8	15	35
		1	3	6	13	33
PM2.5	1	1	1	3	5	18
	2	1	2	3	6	19
		1	1	3	5	18

North Orange County

1.01 Acres

	25	**50**	**100**	**200**	**500**
NOx	103	104	121	159	252
CO	524	688	1018	1980	6537
PM10	1	3	6	13	33
PM2.5	1	1	3	5	18

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
16	1	16	2
Distance Increment Below			
200			
Distance Increment Above			
500			

Updated: 10/21/2010 - Table C-1. 2006 – 2008

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