

**Air Quality and Greenhouse Gas Assessment
for the proposed
Mockingbird Lane Project
in the City of Sonoma, California**

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LIST OF ABBREVIATED TERMS

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
AB	Assembly Bill
AADT	Annual Average Daily Traffic
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AT	averaging time
ATCM	Air Toxic Control Measure
BAAQMD	Bay Area Air Quality Management District
BCDC	Bay Conservation and Development Commission
CalEEMod	California Emissions Estimator Model
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CH_4	methane
CMP	congestion management plan
CO_2e	Carbon dioxide equivalent
DPM	Diesel Particulate Matter
EPA	U.S. Environmental Protection Agency
$^{\circ}\text{F}$	Fahrenheit
FCAA	Federal Clean Air Act
GHG	Greenhouse gas
HFCs	hydrofluorocarbons
mg	milligrams
MT	metric tons
MTC	Metropolitan Transportation Commission
N/A	Not Applicable
NAAQS	National Ambient Air Quality Standards
N_2O	nitrous oxide
NOA	naturally occurring asbestos
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O_3	ozone
OEHHA	Office Environmental Health Hazard Assessment
PDA	Priority Development Area
PFCs	perfluorocarbons
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in diameter
ppm	parts per million
RCPA	Regional Climate Protection Authority
RTP	Regional Transportation Plan
SB	Senate Bill
SCS	Sustainable Communities Strategy
SF_6	sulfur hexafluoride

1 INTRODUCTION

This report documents the results of an Air Quality and Greenhouse Gas (GHG) Assessment completed for the Mockingbird Lane Project (project). The purpose of this Air Quality and GHG Assessment is to evaluate the potential construction and operational emissions associated with the proposed project and to determine the level of impact the project would have on the environment.

1.1 PROJECT LOCATION

The project site is located on the northwest corner of Fourth Street West and West MacArthur Street at 853 Fourth Street East in the City of Sonoma, California.

1.2 PROJECT DESCRIPTION

The Mockingbird Lane project is a proposed residential community designed to be consistent with the Sonoma Residential land use and zoning guidelines, and the existing character of the surrounding community and the City of Sonoma. The proposed project would include a total of 20 units on 18 lots, including four units in duplexes, together with 12 accessory dwelling units (ADUs), as allowed under the City's Development Code; refer to [Exhibit 1: Site Plan](#).

The proposed project is primarily composed of alley style homes (garages accessed from rear, private alley way) with only two plans having front and rear loaded driveways. The project includes front porch elements to allow for creative/drought tolerant designs that would enhance the streetscape. The proposed ADUs would be on the rear of the residential lots and access their parking from the private alley way that can be accessed from both Hayes Street and 4th Street West.

Exhibit 1: Site Plan



SITE SUMMARY

Total Lots: 18 lots
Total Units: 20 units

Plan Types:

Plan 1 (Duplex)	2 du
Plan 2	4 du
Plan 3 / 3X	2 du / 2 du
Plan 4	4 du
Plan 5	4 du
Plan 1 Garage	2 units
Plan 2 Garage	4 units
ADU 1 / Garage	8 units
ADU 2 / Garage	4 units

Parking Summary:
(Reference TM 2.0)



2 ENVIRONMENTAL SETTING

2.1 CLIMATE AND METEOROLOGY

The California Air Resources Board (CARB) divides the State into 15 air basins that share similar meteorological and topographical features. The proposed project is located within the San Francisco Bay Area Air Basin (Basin). This Basin comprises all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, the southern portion of Sonoma County, and the southwestern portion of Solano County. Air quality in this area is determined by such natural factors as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions.

The Basin is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. The Coast Range splits resulting in a western coast gap, Golden Gate, and an eastern coast gap, Carquinez Strait, which allow air to flow in and out of the SFBAAB and the Central Valley.

The climate is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell. During the summer, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below to the surface because of the northwesterly flow produces a band of cold water off the California coast. The cool and moisture-laden air approaching the coast from the Pacific Ocean is further cooled by the presence of the cold-water band resulting in condensation and the presence of fog and stratus clouds along the Northern California coast. In the winter, the Pacific high-pressure cell weakens and shifts southward resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions coupled with moderate winds result in a low air pollution potential.

2.2 AIR POLLUTANTS OF CONCERN

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state laws. These regulated air pollutants are known as “criteria air pollutants” and are categorized into primary and secondary pollutants.

Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxide (NO_x), sulfur dioxide (SO₂), coarse particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), and lead are primary air pollutants. Of these, CO, NO_x, SO₂, PM₁₀, and PM_{2.5} are criteria pollutants. ROG and NO_x are criteria pollutant precursors and go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. For example, the criteria pollutant ozone (O₃) is formed by a chemical reaction between ROG and NO_x in the presence of sunlight. O₃ and nitrogen dioxide (NO₂) are the principal secondary pollutants. Sources and health effects commonly associated with criteria pollutants are summarized in [Table 1: Air Contaminants and Associated Public Health Concerns](#).

Table 1: Air Contaminants and Associated Public Health Concerns		
Pollutant	Major Man-Made Sources	Human Health Effects
Particulate Matter (PM ₁₀ and PM _{2.5})	Power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles and others.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; asthma; chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility.
Ozone (O ₃)	Formed by a chemical reaction between reactive organic gases/volatile organic compounds (ROG or VOC) ¹ and nitrous oxides (NO _x) in the presence of sunlight. Motor vehicle exhaust industrial emissions, gasoline storage and transport, solvents, paints and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield.
Sulfur Dioxide (SO ₂)	A colorless gas formed when fuel containing sulfur is burned and when gasoline is extracted from oil. Examples are petroleum refineries, cement manufacturing, metal processing facilities, locomotives, and ships.	Respiratory irritant. Aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid which can damage marble, iron and steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain.
Carbon Monoxide (CO)	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
Nitrogen Dioxide (NO ₂)	A reddish-brown gas formed during fuel combustion for motor vehicles and industrial sources. Sources include motor vehicles, electric utilities, and other sources that burn fuel.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone. Contributes to global warming and nutrient overloading which deteriorates water quality. Causes brown discoloration of the atmosphere.
Lead	Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been motor vehicles (such as cars and trucks) and industrial sources. Due to the phase out of leaded gasoline, metals processing is the major source of lead emissions to the air today. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.	Exposure to lead occurs mainly through inhalation of air and ingestion of lead in food, water, soil, or dust. It accumulates in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation, and behavioral disorders. Even at low doses, lead exposure is associated with damage to the nervous systems of fetuses and young children, resulting in learning deficits and lowered IQ.
Notes:		
1. Volatile Organic Compounds (VOCs or Reactive Organic Gases [ROG]) are hydrocarbons/organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including ROGs and VOCs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions, and paint (via evaporation).		
Source: California Air Pollution Control Officers Association, <i>Health Effects</i> , http://www.capcoa.org/health-effects/ , Accessed April 10, 2018.		

Ambient Air Quality

CARB monitors ambient air quality at approximately 250 air monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations ten feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. The closest air monitoring station to the proposed project in Sonoma County is the Sebastopol-103 Morris Street

Monitoring Station (located approximately 20 miles to the northwest). Local air quality data from 2015 to 2017 are provided in [Table 2: Ambient Air Quality Data](#). As the Sebastopol-103 Morris Street Monitoring Station does not collect data for PM₁₀, [Table 2](#) also includes data from the Napa-Jefferson Avenue Monitoring station, which is located in Napa County (located approximately 10 miles to the east). [Table 2](#) lists the monitored maximum concentrations and number of exceedances of federal/state air quality standards for each year.

Table 2: Ambient Air Quality Data						
Pollutant	Sebastopol-103 Morris Street ¹			Napa-Jefferson Avenue ²		
	2015	2016	2017	2015	2016	2017
Ozone (O₃)						
1-hour Maximum Concentration (ppm)	0.068	0.073	0.087	0.079	0.080	0.098
8-hour Maximum Concentration (ppm)	0.062	0.064	0.071	0.069	0.067	0.084
<i>Number of Days Standard Exceeded</i>						
CAAQS 1-hour (>0.09 ppm)	0	0	0	0	0	1
NAAQS 8-hour (>0.070 ppm)	1	0	1	0	0	2
Nitrogen Dioxide (NO₂)						
1-hour Maximum Concentration (ppm)	0.0368	0.0318	0.0345	0.0426	0.0390	0.0526
<i>Number of Days Standard Exceeded</i>						
NAAQS 1-hour (>100 ppm)	0	0	0	0	0	0
CAAQS 1-hour (>0.18 ppm)	0	0	0	0	0	0
Particulate Matter Less Than 10 Microns (PM₁₀)						
National 24-hour Maximum Concentration	--	--	--	51.5	32.2	--
State 24-hour Maximum Concentration	--	--	--	50.0	33.0	--
State Annual Average Concentration (CAAQS=20 µg/m ³)	--	--	--	17.5	13.2	--
<i>Number of Days Standard Exceeded</i>						
NAAQS 24-hour (>150 µg/m ³)	--	--	--	0	0	--
CAAQS 24-hour (>50 µg/m ³)	--	--	--	0	0	--
Particulate Matter Less Than 2.5 Microns (PM_{2.5})						
National 24-hour Maximum Concentration	29.9	18.7	81.8	38.2	24.3	199.1
State 24-hour Maximum Concentration	29.9	18.7	81.7	38.2	24.3	199.1
<i>Number of Days Standard Exceeded</i>						
NAAQS 24-hour (>35 µg/m ³)	0	0	4	1	0	13
NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; ppm = parts per million; µg/m ³ = micrograms per cubic meter; NM = not measured						
Notes:						
1. Measurements taken at the Sebastopol-103 Morris Street Monitoring Station located at 103 Morris Street, Sebastopol, California 95472 (CARB# 49891).						
2. Measurements taken at the Napa-Jefferson Avenue Monitoring Station located at 2552 Jefferson Ave., Napa, California 94558 (CARB #28783).						
Source: All pollutant measurements are from the California Air Resources Board Aerometric Data Analysis and Management system (iADAM) database (https://www.arb.ca.gov/adam).						

2.3 SENSITIVE RECEPTORS

Sensitive populations are more susceptible to the effects of air pollution than is the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive receptors in the vicinity of the project site primarily consist of residences adjacent to the east and west. Residences are also located to the south across West MacArthur Street and to the north across the adjacent parking lot. [Table 3: Sensitive Receptors](#), lists the distances and locations

of sensitive receptors within the Project vicinity. The distances depicted in Table 3 are based on the distance from the project site to the vicinity sensitive receptors.

Table 3: Sensitive Receptors	
Receptor Type/Description	Distance and Direction from the Project Site¹
Single Family Residences	50 feet east and west
Single Family Residences	90 feet south
Sonoma Hills Retirement Center	90 feet south
Single Family Residences	250 feet north
Sonoma Valley Hospital	520 feet north
Sassarini Elementary School and Preschool	830 feet north
¹ Distance calculated from property line of proposed project site and property line of the sensitive receptors	

3 REGULATORY SETTING

3.1 FEDERAL

Federal Clean Air Act

Air quality is federally protected by the Clean Air Act and its amendments. Under the Federal Clean Air Act (FCAA), the U.S. Environmental Protection Agency (EPA) developed the primary and secondary National Ambient Air Quality Standards (NAAQS) for the criteria air pollutants including ozone, NO₂, CO, SO₂, PM₁₀, PM_{2.5}, and lead. Proposed projects in or near nonattainment areas could be subject to more stringent air-permitting requirements. The Clean Air Act requires each state to prepare a State Implementation Plan (SIP) to demonstrate how it will attain the NAAQS within the federally imposed deadlines.

The EPA can withhold certain transportation funds from states that fail to comply with the planning requirements of the Clean Air Act. If a state fails to correct these planning deficiencies within two years of Federal notification, the EPA is required to develop a Federal implementation plan for the identified nonattainment area or areas. The provisions of 40 CFR Parts 51 and 93 apply in all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan. The EPA has designated enforcement of air pollution control regulations to the individual states. The SVAB attainment status with respect to federal standards is summarized in [Table 4: State and Federal Ambient Air Quality Standards](#).

3.2 STATE OF CALIFORNIA

California Air Resources Board

CARB administers the air quality policy in California. The California Ambient Air Quality Standards (CAAQS) were established in 1969 pursuant to the Mulford-Carrell Act. These standards, included with the National Ambient Air Quality Standards (NAAQS) in [Table 4](#), are generally more stringent and apply to more pollutants than the NAAQS. In addition to the criteria pollutants, CAAQS have been established for visibility reducing particulates, hydrogen sulfide, and sulfates.

The California Clean Air Act (CCAA), which was approved in 1988, requires that each local air district prepare and maintain an Air Quality Management Plan (AQMP) to achieve compliance with CAAQS. These AQMPs also serve as the basis for the preparation of the SIP for meeting federal clean air standards for the State of California. Like the EPA, CARB also designates areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a state standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events such as wildfires, volcanoes, etc. are not considered violations of a State standard, and are not used as a basis for designating areas as nonattainment. The Basin attainment status with respect to state standards is summarized in [Table 4](#).

Table 4: State and Federal Ambient Air Quality Standards					
Pollutant	Averaging Time	State Standards ¹		Federal Standards ²	
		Concentration	Attainment Status	Concentration ³	Attainment Status
Ozone (O ₃)	8 Hour	0.070 ppm (137 µg/m ³)	N ⁹	0.070 ppm	N ⁴
	1 Hour	0.09 ppm (180 µg/m ³)	N	NA	N/A ⁵
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m ³)	A	9 ppm (10 mg/m ³)	A
	1 Hour	20 ppm (23 mg/m ³)	A	35 ppm (40 mg/m ³)	A ⁶
Nitrogen Dioxide (NO ₂)	1 Hour	0.18 ppm (339 µg/m ³)	A	0.10 ppm ¹¹	U
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	-	0.053 ppm (100 µg/m ³)	A
Sulfur Dioxide ¹² (SO ₂)	24 Hour	0.04 ppm (105 µg/m ³)	A	0.14 ppm (365 µg/m ³)	A
	1 Hour	0.25 ppm (655 µg/m ³)	A	0.075 ppm (196 µg/m ³)	A
	Annual Arithmetic Mean	NA	-	0.03 ppm (80 µg/m ³)	A
Particulate Matter (PM ₁₀)	24-Hour	50 µg/m ³	N	150 µg/m ³	-
	Annual Arithmetic Mean	20 µg/m ³	N ⁷	NA	U
Fine Particulate Matter (PM _{2.5}) ¹⁵	24-Hour	NA	-	35 µg/m ³	U/A
	Annual Arithmetic Mean	12 µg/m ³	N ⁷	12 µg/m ³	N
Sulfates (SO ₄₋₂)	24 Hour	25 µg/m ³	A	NA	-
Lead (Pb) ^{13, 14}	30-Day Average	1.5 µg/m ³	-	NA	A
	Calendar Quarter	NA	-	1.5 µg/m ³	A
	Rolling 3-Month Average	NA	-	0.15 µg/m ³	-
Hydrogen Sulfide (H ₂ S)	1 Hour	0.03 ppm (0.15 µg/m ³)	U	NA	-
Vinyl Chloride (C ₂ H ₃ Cl)	24 Hour	0.01 ppm (26 µg/m ³)	-	NA	-
Visibility Reducing Particles ⁸	8 Hour (10:00 to 18:00 PST)	-	U	-	-

A = attainment; N = nonattainment; U = unclassified; N/A = not applicable or no applicable standard; ppm = parts per million; µg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter; - = not indicated or no information available.

- California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM₁₀, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM₁₀ annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.
- National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.070 ppm (70 ppb) or less. The 24-hour PM₁₀ standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour PM_{2.5} standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m³.
Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM₁₀ is met if the 3-year average falls below the standard at every site. The annual PM_{2.5} standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.
- National air quality standards are set by the EPA at levels determined to be protective of public health with an adequate margin of safety.

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4. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. An area will meet the standard if the fourth-highest maximum daily 8-hour ozone concentration per year, averaged over three years, is equal to or less than 0.070 ppm. EPA will make recommendations on attainment designations by October 1, 2016, and issue final designations October 1, 2017. Nonattainment areas will have until 2020 to late 2037 to meet the health standard, with attainment dates varying based on the ozone level in the area.
5. The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.
6. In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
7. In June 2002, CARB established new annual standards for PM_{2.5} and PM₁₀.
8. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.
9. The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.
10. On January 9, 2013, EPA issued a final rule to determine that the Bay Area attains the 24-hour PM_{2.5} national standard. This EPA rule suspends key SIP requirements as long as monitoring data continues to show that the Bay Area attains the standard. Despite this EPA action, the Bay Area will continue to be designated as “non-attainment” for the national 24-hour PM_{2.5} standard until such time as the Air District submits a “redesignation request” and a “maintenance plan” to EPA, and EPA approves the proposed redesignation.
11. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100ppm (effective January 22, 2010). The US Environmental Protection Agency (EPA) expects to make a designation for the Bay Area by the end of 2017.
12. On June 2, 2010, the U.S. EPA established a new 1-hour SO₂ standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO₂ NAAQS however must continue to be used until one year following U.S. EPA initial designations of the new 1-hour SO₂ NAAQS.
13. CARB has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure below which there are no adverse health effects determined.
14. National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.
15. In December 2012, EPA strengthened the annual PM_{2.5} National Ambient Air Quality Standards (NAAQS) from 15.0 to 12.0 micrograms per cubic meter (µg/m³). In December 2014, EPA issued final area designations for the 2012 primary annual PM_{2.5} NAAQS. Areas designated “unclassifiable/attainment” must continue to take steps to prevent their air quality from deteriorating to unhealthy levels. The effective date of this standard is April 15, 2015.

Source: Bay Area Air Quality Management District, *Air Quality Standards and Attainment Status*, <http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status>, accessed October 24, 2018.

3.3 REGIONAL

Bay Area Air Quality Management District

The BAAQMD is the regional agency with jurisdiction over the nine-county region located in the Basin. The Association of Bay Area Governments (ABAG), Metropolitan Transportation Commission (MTC), county transportation agencies, cities and counties, and various nongovernmental organizations also join in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs.

As seen in [Table 4](#), in general, the Bay Area experiences low concentrations of most pollutants when compared to federal standards, except for O₃ and particulate matter (PM), for which standards are exceeded periodically. With respect to federal standards, the Bay Area’s attainment status for 8-hour ozone is classified as “marginal nonattainment” and “nonattainment” for PM_{2.5}. As a designated “marginal” nonattainment area for the federal 8-hour ozone standard, preparation of a SIP is currently not required. However, in response to the EPA’s designation of the Basin for the previous nonattainment 8-hour federal ozone standard, the BAAQMD, ABAG, and MTC were required to develop an ozone attainment plan to meet this standard. The *1999 Ozone Attainment Plan* was prepared and adopted by these agencies in June 1999 and this federal plan was updated in 2001. The most recent state ozone plan is the *Bay Area 2010 Clean Air Plan*. The *2010 Clean Air Plan* was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, toxic air contaminants, and greenhouse

gases. In 1998, after many years without violations of any CO standards, the attainment status for CO was upgraded to "attainment."

Under CEQA, the BAAQMD is a commenting responsible agency on air quality within its jurisdiction or impacting its jurisdiction. The BAAQMD reviews projects to ensure that they would: (1) support the primary goals of the latest Air Quality Plan; (2) include applicable control measures from the Air Quality Plan; and (3) not disrupt or hinder implementation of any Air Quality Plan control measures.

In May 2010, the BAAQMD adopted its updated *California Environmental Quality Act (CEQA) Air Quality Guidelines* as a guidance document to provide lead government agencies, consultants, and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA. The BAAQMD *CEQA Guidelines* include methodologies and thresholds for addressing project and program level air quality and greenhouse gas (GHG) emissions. The Guidelines were called into question by an order issued March 5, 2012, in *California Building Industry Association (CBIA) v. BAAQMD* (Alameda Superior Court Case No. RGI0548693). The Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds. The court issued a writ of mandate ordering the BAAQMD to set aside the thresholds and cease dissemination of them until the BAAQMD had complied with CEQA. Notably, the court's ruling was based solely on BAAQMD's failure to comply with CEQA. The court did not reach any issues relating to the validity of the scientific reasoning underlying the recommended significance thresholds.

In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds.¹ CBIA sought review by the California Supreme Court on three issues, including the appellate court's decision to uphold the BAAQMD's adoption of the thresholds, and the Court granted review on just one: Under what circumstances, if any, does CEQA require an analysis of how existing environmental conditions will impact future residents or users of a proposed project? In December 2015, the California Supreme Court confirmed that CEQA, with several specific exceptions, is concerned with the impacts of a project on the environment, not the effects the existing environment may have on a project.² The BAAQMD published a new version of the Guidelines dated May 2017, which includes revisions made to address the Supreme Court's opinion. The BAAQMD is currently working to revise any outdated information in the Guidelines as part of its update to the CEQA Guidelines and thresholds of significance.

Bay Area Air Quality Planning Relative to State and Federal Standards

Air quality plans developed to meet federal requirements are referred to as State Implementation Plans. The federal and state Clean Air Acts require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM10 standard). The *2017 Clean Air Plan: Spare the Air, Cool the Climate* was adopted on April 19, 2019, by the BAAQMD.

The 2017 Clean Air Plan provides a regional strategy to protect public health and protect the climate. To protect public health, the plan describes how the BAAQMD will continue progress toward attaining all state and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities. To protect the climate, the 2017 Clean Air Plan defines a vision for transitioning the region to a post-carbon economy needed to achieve ambitious greenhouse gas (GHG)

¹ California Court of Appeal, First Appellate District, Case Nos. A135335 & A136212.

² *California Building Industry Association v. Bay Area Air Quality Management District*, 62 Cal. 4th 369 [No. S 213478]

reduction targets for 2030 and 2050 and provides a regional climate protection strategy that will put the Bay Area on a pathway to achieve those GHG reduction targets.

The 2017 Clean Air Plan includes a wide range of control measures designed to decrease emissions of the air pollutants that are most harmful to Bay Area residents, such as particulate matter, ozone, and toxic air contaminants; to reduce emissions of methane and other “super-GHGs” that are potent climate pollutants in the near-term; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.

3.4 GREENHOUSE GAS EMISSIONS SETTING AND REGULATIONS

Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of Greenhouse Gases (GHGs) have a broader, global impact. Global warming associated with the “greenhouse effect” is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the earth’s atmosphere. Climate change is the observed increase in the average temperature of the Earth’s atmosphere and oceans along with other substantial changes in climate—such as wind patterns, precipitation, and storms—over an extended period of time. Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO₂), methane (CH₄), nitrous oxides (N₂O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/ manufacturing, utility, residential, commercial, and agricultural sectors.

To date, no national standards have been established for nationwide GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level. Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

U.S. Environmental Protection Agency Endangerment Finding

The EPA’s authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court’s ruling, the EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs (CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆) constitute a threat to public health and welfare. Thus, it is the Supreme Court’s interpretation of the existing Act and the EPA’s assessment of the scientific evidence that form the basis for the EPA’s regulatory actions.

Assembly Bill 32

The primary act that has driven GHG regulation and analysis in California include the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599), which instructs CARB to develop and enforce regulations for the reporting and verifying of statewide GHG emissions. AB 32 directed CARB to set a GHG emissions limit based on 1990 levels, to be achieved by 2020.

The bill set a timeline for adopting a scoping plan for achieving GHG reductions in a technologically and economically feasible manner. The heart of the bill is the requirement that statewide GHG emissions be reduced to 1990 levels by 2020.

CARB adopted its latest Scoping Plan on December 14, 2017. The Scoping Plan functions as a roadmap to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB's Scoping Plan contains the main strategies California will implement to reduce carbon dioxide equivalent (CO_2e)³ emissions by 174 million metric tons (MT), or approximately 30 percent, from the State's projected 2020 emissions level of 596 million MTCO_2e under a business as usual (BAU) scenario. This is a reduction of 42 million MTCO_2e , or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.

Senate Bill 32

Signed into law in September 2016, Senate Bill (SB) 32 codifies the 2030 GHG reduction target in Executive Order B-30-15 (40 percent below 1990 levels by 2030). CARB also must adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG reductions to achieve 40 percent below 1990 levels by 2030.

Senate Bill 375

SB 375, known as the Sustainable Communities Strategy and Climate Protection Act, was signed into law in September 2008. SB 375 builds upon AB 32 by requiring CARB to develop regional GHG reduction targets for automobile and light truck sectors for 2020 and 2035, as compared to 2005 emissions levels. The per-capita GHG emissions reduction targets for passenger vehicles in the San Francisco Bay Area include a seven percent reduction by 2020 and a 15 percent reduction by 2035.

Consistent with the requirements of SB 375, Metropolitan Transportation Commission (MTC) partnered with the Association of Bay Area Governments (ABAG), BAAQMD, and Bay Conservation and Development Commission (BCDC) to prepare the region's Sustainable Communities Strategy (SCS) as part of the Regional Transportation Plan (RTP) process. The SCS is referred to as Plan Bay Area.

Originally adopted in 2013 Plan Bay Area, established a course for reducing per-capita GHG emissions through the promotion of compact, mixed-use residential and commercial neighborhoods near transit, particularly within identified Priority Development Areas (PDAs). Building upon the development strategies outlined in the original plan, Plan Bay Area 2040 was adopted in July 2017 as a focused update with revised planning assumptions based current demographic trends. Target areas in the Plan Bay Area 2040 Action Plan area related to reducing GHG emissions, improving transportation access, maintaining the region's infrastructure, and enhancing resilience to climate change (including fostering open space as a means to reduce flood risk and enhance air quality).

³ Carbon dioxide equivalent (CO_2e) is defined as a quantity that is used to compare the emissions from various greenhouse gases based upon their global warming potential.

Bay Area Clean Air Plan

BAAQMD adopted the 2017 Bay Area Clean Air Plan, (2017 CAP) in April 2017. This plan updates the previous 2010 Clean Air Plan and focuses on two closely-related goals: protecting public health and protecting the climate. To protect the climate, the 2017 CAP defines a vision for transitioning the region to a post-carbon economy needed to achieve ambitious GHG reduction targets for 2030 and 2050 and provides a regional climate protection strategy that will put the Bay Area on a pathway to achieve those GHG targets. The 2017 CAP includes a wide range of control measures designed to decrease emissions of methane and other “super-GHGs” that are potent climate pollutants in the near-term; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.

California Regulations and Building Codes

Title 20 - Appliance Efficiency Regulations. The California Energy Commission adopted Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608) on October 11, 2006. The regulations were 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. While 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.

Title 24 - California Building Code. The California Energy Resources Conservation and Development Commission adopted energy conservation standards for new residential and nonresidential buildings in June 1977 in response to a legislative mandate to reduce California’s energy consumption. These standards were most recently revised in 2016 and went into effect on January 1, 2017 (Title 24, Part 6, of the California Code of Regulations [CCR]). The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.

On July 17, 2008, the California Building Standards Commission adopted the nation’s first green building standards. The California Green Building Standards Code was adopted as part of the California Building Standards Code (CALGreen) (Part 11, Title 24, CCR). The green building standards that became mandatory in the 2010 edition of the code established voluntary standards on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics. The most recent update to the CALGreen Code went into effect January 1, 2017.

City of Sonoma

The City of Sonoma instated its commitment to reducing GHG emissions through the adoption of a municipal GHG reduction plan. As one result of this plan, all City facilities have been upgraded with respect to energy efficiency, including lighting and A/C controls. Additionally, in July 2013, Sonoma joined the Sonoma Clean Power consortium, a Community Choice Aggregation program that provides electrical service generated by renewable resources. The City of Sonoma adopted and amended CALGreen as part of the City’s Municipal Code to require CALGreen plus Tier 1 level of compliance for all new buildings.

In October of 2016, the City Council agreed to switch the municipal electrical supply to the “Evergreen” program offered by Sonoma Clean Power. The Evergreen program is 100 percent local, renewable power. As a member agency of the Regional Climate Protection Authority (RCPA), the City of Sonoma participated in the development of *Climate Action 2020*. Chapter 5 of *Climate Action 2020* includes a GHG emissions profile for the City of Sonoma and the individual GHG measures that the City of Sonoma selected for inclusion in the plan. On November 21, 2016, the City Council adopted the *Climate Action 2020* measures for the City of Sonoma, and the emissions reduction targets contained in *Climate Action 2020*.

4 SIGNIFICANCE CRITERIA

4.1 CEQA THRESHOLDS

The proposed project qualifies for exemption from CEQA in accordance with Section 15332 of the State CEQA Guidelines for in-fill development projects. The exemption applies because the project is located in an urbanized area.

The environmental analysis in this memorandum is patterned after the Initial Study Checklist recommended by the *CEQA Guidelines*, as amended, to support the CEQA exemption and demonstrate that the project would not result in air quality impacts. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant environmental impact if it causes one or more of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for O₃ precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people;
- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

5 POTENTIAL IMPACTS AND MITIGATION

5.1 AIR QUALITY IMPACTS

Threshold 5.1 Would the project conflict with or obstruct implementation of the applicable air quality plan?

A project would be consistent with the 2017 Clean Air Plan Progress Report if the project would not exceed the growth assumptions in the plan. The primary method of determining consistency with the 2017 Clean Air Plan growth assumptions is consistency with the General Plan land use designations and zoning ordinance designations for the site. If the General Plan growth forecast was adopted prior to the adoption of the 2017 Clean Air Plan, then it can be assumed that the 2017 Clean Air Plan incorporates the growth forecast from the General Plan.

The Clean Air Plan assumptions for projected air emissions and pollutants in the City are based on the land use and development projection assumptions in the General Plan. The project is a proposed residential community designed to be consistent with the Sonoma Residential land use and zoning guidelines, and the existing character of the surrounding community and the City of Sonoma. The project is conforming with City regulations (i.e., consistent with the current land use designations for the project site). Additionally, as described below in Threshold 5.2, construction and operational air quality emissions generated by the proposed project would not exceed the BAAQMD's screening thresholds. These thresholds are established to identify projects that have the potential to generate a substantial amount of criteria air pollutants. Because the proposed project would not exceed these thresholds, the proposed project would not be considered by the BAAQMD to be a substantial emitter of criteria air pollutants and would not contribute to any non-attainment areas in the San Francisco Bay Area Air Basin. Therefore, the project would be in compliance with the 2017 Clean Air Plan and impacts would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant.

Threshold 5.2 Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

The BAAQMD has identified thresholds of significance for criteria pollutant emissions and criteria air pollutant precursors, including ROG, NO_x, PM₁₀, and PM_{2.5}. Developments below the significant thresholds are not expected to generate sufficient criteria air pollutant emissions to violate any air quality standard or contribute substantially to an existing or projected air quality violation. The proposed project would include a total of 20 units on 18 lots, including four units in duplexes, together with 12 accessory dwelling units.

Construction Emissions

Construction of the project is anticipated to begin in June 2019 and would occur over an 18-month period. Site grading would be minimal and would require 2,000 cubic yards of fill. Construction equipment would include concrete/industrial saws, graders, tractors, loaders, and backhoes during demolition and grading, pavers and rollers during paving, cranes, forklifts, generator sets, tractors, loaders, backhoes, and welders

during building construction, and air compressors during architectural coating. Emissions for each construction phase have been quantified based upon the phase durations and equipment types. The analysis of daily construction emissions has been prepared utilizing the California Emissions Estimator Model version 2016.3.2 (CalEEMod). Although the project includes single-family units and accessory dwelling units, the single-family land use type was used to be conservative. Refer to [Appendix A: Air Quality and Greenhouse Gas Emissions Data](#), for the CalEEMod outputs and results. Project construction emissions are shown in [Table 5: Construction Emissions](#), presents the maximum daily construction emissions. It should be noted that the BAAQMD construction thresholds are for average daily emissions. However, this analysis conservatively compares the modeled maximum emissions to the average daily thresholds.

Emissions Source	Pollutant (pounds per day) ^{1,2}					
	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO _x)	Exhaust		Fugitive Dust	
			Coarse Particulate Matter (PM ₁₀)	Fine Particulate Matter (PM _{2.5})	Coarse Particulate Matter (PM ₁₀)	Fine Particulate Matter (PM _{2.5})
2019 Construction Emissions	4.44	45.65	2.39	2.20	7.87	4.28
2020 Construction Emissions	14.74	21.28	1.23	1.16	0.14	0.04
Maximum Unmitigated	14.74	45.65	2.39	2.20	7.78	4.28
<i>BAAQMD Significance Threshold</i>	54	54	82	54	N/A	N/A
Exceed BAAQMD Threshold?	No	No	No	No	N/A	N/A

Notes:
 1. Emissions were calculated using CalEEMod. Maximum daily emissions are conservatively reported. Fugitive dust emissions include the implementation of BAAQMD Basic Construction Mitigation Measures (watering exposed surfaces twice daily, cover haul trucks, clean track-outs, etc.), which are required for all projects.
 2. Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, updated May 2017.
 Source: Refer to the CalEEMod outputs provided in Appendix A, *Air Quality and Greenhouse Gas Emissions Data*.

Emitted pollutants would include ROG, NO_x, PM₁₀, and PM_{2.5}. ROG emissions would be the greatest during the paving phase of construction. The largest amount of NO_x emissions would occur during the construction phase. PM₁₀ and PM_{2.5} emissions would occur from fugitive dust and from construction equipment exhaust. The majority of PM₁₀ and PM_{2.5} emissions would be generated by fugitive dust from earthwork activities. Exhaust emissions from construction activities include emissions associated with the transport of machinery and supplies to and from the project site, emissions produced on-site as the equipment is used, and emissions from trucks transporting materials to and from the site.

[Table 5](#) shows that unmitigated emissions would not exceed significance thresholds; therefore, a less than significant impact would occur with regard to construction emissions. It should be noted that although the proposed project would result in construction emissions below BAAQMD thresholds, Basic Construction Mitigation Measures would be required to be implemented during construction including dust control procedures (watering, covering/stabilizing disturbed areas, limiting on-site vehicle speeds, etc.) to further reduce emissions. As the proposed project would be required to comply with City and BAAQMD standards, impacts are less than significant.

Operational Emissions

Operational emissions for residential developments are typically generated from mobile sources (burning of fossil fuels in cars); energy sources (cooling, heating, and cooking); and area sources (landscape equipment and household products). According to Table 6: Operational Emissions, project operational emission would not exceed BAAQMD Thresholds. Impacts would be less than significant.

Table 6: Operational Emissions						
Emission Source	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO _x)	Exhaust		Fugitive	
			Coarse Particulate Matter (PM ₁₀)	Fine Particulate Matter (PM _{2.5})	Coarse Particulate Matter (PM ₁₀)	Fine Particulate Matter (PM _{2.5})
Annual Emissions (maximum tons per year)						
Area Source Emissions	0.46	0.01	0.04	0.04	--	--
Energy Emissions	0.01	0.04	0.00	0.00	--	--
Mobile Emissions ¹	0.11	0.55	0.00	0.00	0.26	0.07
Total Project Unmitigated Emissions	0.58	0.60	0.05	0.05	0.26	0.07
<i>BAAQMD Threshold¹</i>	<i>10</i>	<i>10</i>	<i>15</i>	<i>10</i>	<i>N/A</i>	<i>N/A</i>
Is Threshold Exceeded?	No	No	No	No	N/A	N/A
Daily Emissions (pounds)						
Area Source Emissions	34.70	0.67	6.08	6.08	--	--
Energy Emissions	0.03	0.23	0.02	0.02	--	--
Mobile Emissions ¹	0.72	3.25	0.03	0.03	1.56	0.42
Total Project Unmitigated Emissions	35.45	4.16	6.12	6.12	1.56	0.42
<i>BAAQMD Threshold²</i>	<i>54</i>	<i>54</i>	<i>82</i>	<i>54</i>	<i>N/A</i>	<i>N/A</i>
Is Threshold Exceeded?	No	No	No	No	N/A	N/A
Notes:						
1. Mobile emissions conservatively represent emissions associated with the full project (i.e., 268 daily vehicle trips), and do not take credit/trip reductions for the existing uses.						
2. Bay Area Air Quality Management District, <i>California Environmental Quality Act Air Quality Guidelines</i> , 2017.						
Source: Refer to the CalEEMod outputs provided in Appendix A, <i>Air Quality and Greenhouse Gas Emissions Modeling Data</i> .						

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant.

Threshold 5.3 Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The SFBAAB is designated nonattainment for O₃, PM₁₀, and PM_{2.5} for State standards and nonattainment for O₃ and PM_{2.5} for Federal standards. As discussed above, the project's construction and operational emissions by themselves would not have the potential to exceed the BAAQMD significance thresholds for criteria pollutants.

Since these thresholds indicate whether an individual project's emissions have the potential to affect cumulative regional air quality, it can be expected that the project-related construction emissions would not be cumulatively considerable. The BAAQMD recommends Basic Construction Control Measures for all projects whether or not construction-related emissions exceed the thresholds of significance. Compliance with BAAQMD construction-related requirements are considered to reduce cumulative impacts at a Basin-wide level. As project emissions would be below the BAAQMD screening criteria, the project would not exceed the BAAQMD's construction or operational thresholds of significance. Therefore, project emissions would not result in a cumulatively considerable contribution to significant cumulative air quality impacts.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 5.4 Would the project expose sensitive receptors to substantial pollutant concentrations?

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. As noted above, the closest sensitive receptors are the existing residential uses surrounding the project site.

Toxic Air Contaminants

Construction would result in the generation of diesel particulate matter (DPM) emissions from the use of off-road diesel equipment required. The amount to which the receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to toxic air contaminant (TAC) emission levels that exceed applicable standards). Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer.

Construction equipment and associated heavy-duty truck traffic generate diesel exhaust, which is a known TAC. Diesel exhaust from construction equipment operating at the site poses a health risk to nearby sensitive receptors. For construction activity, DPM is the primary toxic air contaminant of concern. On-road diesel-powered haul trucks traveling to and from the construction area to deliver materials and equipment are less of a concern because they would not stay on the site for long durations. Diesel exhaust

from construction equipment operating at the site poses a health risk to nearby sensitive receptors. The BAAQMD provides guidance for evaluating impacts from TACs in its *CEQA Air Quality Guidelines* document. As noted therein, an incremental cancer risk of greater than 10 cases per million at the Maximally Exposed Individual (MEI) would result in a significant impact. The BAAQMD considers exposure to annual PM_{2.5} concentrations that exceed 0.3 µg/m³ from a single source to be significant. The BAAQMD significance threshold for non-cancer hazards is 1.0.

Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer. The use of diesel-powered construction equipment would be episodic and would occur throughout the site. Additionally, construction activities would be subject to and would comply with California regulations limiting idling to no more than 5 minutes, which would further reduce nearby sensitive receptors' exposure to temporary and variable DPM emissions. Furthermore, even during the most intense year of construction, emissions of DPM would be generated from different locations on the project site rather than in a single location because different types of construction activities (e.g., site preparation and building construction) would not occur at the same place at the same time.

The EPA recommended screening model AERSCREEN has been used to evaluate potential health effects to sensitive receptors from construction emissions of DPM. AERSCREEN is the recommended screening model based on the AERMOD dispersion model. The model produces estimates of worst-case concentrations without the need for hourly meteorological data. According to the EPA Support Center for Regulatory Atmospheric Modeling (SCRAM) website, AERSCREEN is intended to produce concentration estimates that are equal to or greater than the estimates produced by AERMOD with a fully developed set of meteorological and terrain data.⁴ Maximum (worst case) PM_{2.5} exhaust construction emissions over the entire construction period were used in AERSCREEN to approximate construction DPM emissions. Risk levels were calculated according to the California Office of Environmental Health Hazard Assessment (OEHHA) guidance document, *Air Toxics Hot Spots Program Risk Assessment Guidelines* (February 2015).

PM₁₀ and PM_{2.5} construction emissions rates in grams per second were calculated from the total annual emissions reported in CalEEMod (0.1218 tons per year of PM₁₀ exhaust and 0.1974 tons per year of total PM_{2.5}). Annual emissions were converted to grams per second and these emissions rates were input into AERSCREEN. Results of this assessment indicate that the maximum concentration of PM_{2.5} during construction would be 0.025 µg/m³ which is below the BAAQMD 0.3 µg/m³ significance threshold. The highest calculated carcinogenic risk from project construction is 2.44 per million based on an annual PM₁₀ concentration of 0.015 µg/m³. The risk calculation used a construction exposure duration of 18 months and a breathing rate of 1,090 liters per kilogram of bodyweight per day (based on OEHHA 95 percentile breathing rate for the most conservative age group). Non-cancer hazards for DPM would be below BAAQMD threshold of 1.0, with a chronic hazard index computed at 0.003 and an acute hazard index of 0.06. As described above, worst-case construction risk levels based on screening-level modeling (AERSCREEN) and conservative assumptions would be below the BAAQMD's thresholds. Therefore, construction risk levels would be less than significant.

During operations, the proposed residential development would not be not expected to result in any localized emissions that could expose sensitive receptors in the surrounding environment to unhealthy

⁴ US EPA. Air Quality Dispersion Modeling- Screening Models. 2017. <https://www.epa.gov/scram/air-quality-dispersion-modeling-screening-models>

air pollutant levels. Residences are not stationary sources of toxic air contaminants, and do not involve TAC emissions. Once construction is complete, operation of the future development would not be a source of TAC emissions and, therefore, would not expose sensitive receptors to substantial pollutant concentrations. Impacts would be less than significant, and no mitigation is required.

Localized Carbon Monoxide Hotspots

The primary mobile-source criteria pollutant of local concern is carbon monoxide. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Transport of this criteria pollutant is extremely limited; CO disperses rapidly with distance from the source under normal meteorological conditions. Under certain meteorological conditions, however, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Areas of high CO concentrations, or “hot spots,” are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours. CO concentration modeling is therefore typically conducted for intersections that are projected to operate at unacceptable levels of service during peak commute hours.

The SFBAAB is designated as attainment for carbon monoxide (CO). Emissions and ambient concentrations of CO have decreased dramatically in the SFBAAB with the introduction of the catalytic converter in 1975. No exceedances of the CAAQS or NAAQS for CO have been recorded at nearby monitoring stations since 1991. As a result, the BAAQMD screening criteria notes that CO impacts may be determined to be less than significant if a project is consistent with the applicable congestion management plan (CMP) and would not increase traffic volumes at local intersections to more than 44,000 vehicles per hour, or 24,000 vehicles per hour for locations in heavily urban areas, where “urban canyons” formed by buildings tend to reduce air circulation. Based on the scope of the proposed project (approximately eight acres of mixed use with 204 dwelling units), traffic would increase along surrounding roadways during long-term operational activities.

However, according to the Traffic Impact Study prepared for the proposed project, the entire project would generate 19 total a.m. peak hour trips and 25 total p.m. peak hour trips. The project study intersection with the highest traffic volumes (East MacArthur Street/Broadway) would have 2,212 vehicles during the morning peak hour and 2,418 vehicles during the evening peak hour. Therefore, the project would not involve intersections with more than 24,000 or 44,000 vehicles per hour. As a result, the project would not generate a significant number of vehicle trips and impacts associated with CO concentrations would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 5.5 Would the project create objectionable odors affecting a substantial number of people?**Construction Odors**

Potential odors could arise from the diesel construction equipment used on-site, as well as from architectural coatings and asphalt off-gassing. Odors generated from the referenced sources are common in the man-made environment and are not known to be substantially offensive to adjacent receptors. Additionally, odors generated during construction activities would be temporary and would disperse rapidly.

Odors are typically regulated under BAAQMD Regulation 1, Rule 1-301, Public Nuisance, which states that no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health, or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property. Under BAAQMD's Rule 1-301, a facility that receives three or more violation notices within a 30-day period can be declared a public nuisance. In addition, BAAQMD's thresholds for odors are qualitative based on BAAQMD's Regulation 7, Odorous Substances. This rule places general limitations on odorous substances and specific emission limitations on certain odorous compounds. Therefore, construction odors are not considered to be a significant impact.

According to the BAAQMD, land uses associated with odor complaints typically include wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, and chemical plants. The proposed project does not include any uses identified by the BAAQMD as being associated with odors. Therefore, there would be no impacts from the proposed project.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

5.2 GREENHOUSE GAS EMISSIONS IMPACTS**Threshold 5.6 Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?****Construction Greenhouse Gas Emissions**

The project would include direct and indirect GHG emissions. Direct operational-related GHG emissions for the proposed project would include emissions from area and mobile sources, while indirect emissions are from energy consumption, water demand, and solid waste.

Construction of the project would result in direct emissions of CO₂, N₂O, and CH₄ from the operation of construction equipment and the transport of materials and construction workers to and from the project site. Construction GHG emissions are typically summed and amortized over the lifetime of the project

(assumed to be 30 years), then added to the operational emissions.⁵ BAAQMD does not have a threshold for construction GHG emissions. However, the BAAQMD advises that construction GHG should be disclosed and a determination on the significance of construction GHG emissions in relation to meeting AB 32 GHG reduction goals should be made. Project construction GHG emissions are shown in [Table 7: Construction Greenhouse Gas Emissions](#).

Emissions Source	MTCO₂e
2019	218
2020	272
Total	490
Construction Amortized Over 30 Years	16

Source: CalEEMod version 2016.3.2. Refer to Appendix A for model outputs.

Operational Greenhouse Gas Emissions

Operational or long-term emissions occur over the life of the proposed project. GHG emissions would result from direct emissions such as project generated vehicular traffic, on-site combustion of natural gas, operation of any landscaping equipment. Operational GHG emissions would also result from indirect sources, such as off-site generation of electrical power over the life of the project, the energy required to convey water to, and wastewater from the project site, the emissions associated with solid waste generated from the project site, and any fugitive refrigerants from air conditioning or refrigerators. [Table 8: Operational Greenhouse Gas Emissions](#), summarizes the total GHG emissions associated with proposed project. As shown, the project would generate approximately 443 MTCO₂e/year, which is below the 6.6 MTCO₂e per service population per year threshold as well as the BAAQMD's 1,100 MTCO₂e per year threshold.

⁵ The project lifetime is based on the standard 30-year assumption of the South Coast Air Quality Management District (South Coast Air Quality Management District, *Minutes for the GHG CEQA Significance Threshold Stakeholder Working Group #13*, August 26, 2009).

Table 8: Operational Greenhouse Gas Emissions	
Emissions Source	MTCO₂e per Year
Area Source	6
Energy	100
Mobile	311
Waste	19
Water and Wastewater	6
Total	443
Service Population ¹	69
Emissions Per Service Population	6.4
Threshold	6.6
Threshold Exceeded?	No
Notes: 1. Service population is based on 32 dwelling units and 2.17 persons per household in the City of Sonoma based on the State of California Department of Finance, <i>E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2018 with 2010 Census Benchmark</i> , May 2018.	
Source: CalEEMod version 2016.3.2. Refer to Appendix A for model outputs.	

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 5.7 conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

As discussed above, the City is a member agency of the Regional Climate Protection Authority (RCPA). Chapter 5 of the RCPA Climate Action 2020 includes individual GHG measures for the City, which have been adopted by the City Council. These measures include state and regional measures as well as local measures. The state and regional measures include increasing building energy efficiency, increasing renewable energy use, encouraging a shift toward low-carbon transportation options, increasing vehicle and equipment efficiency, encouraging a shift toward low-carbon fuels, increasing solid waste diversion, increasing capture and use of methane from landfills, reducing water consumption, increasing water and wastewater infrastructure efficiency, and increasing use of renewable energy in water and wastewater systems. The local measures include increasing building energy efficiency, increasing renewable energy use, reducing travel demand through focused growth, encouraging a shift toward low-carbon transportation options, encouraging a shift toward low-carbon fuels, reducing idling, reducing water consumption, and increasing recycled water and greywater. These measures, as described in Climate Action 2020 are primarily municipal measures that require improved and efficient infrastructure, and/or building efficiency.

The proposed project would be required to comply with all building codes in effect at the time of construction which include energy conservation measures mandated by Title 24 of the California Building Standards Code – Energy Efficiency Standards. Because Title 24 standards require energy conservation

features in new construction (e.g., high-efficiency lighting, high-efficiency heating, ventilating, and air-conditioning [HVAC] systems, thermal insulation, double-glazed windows, water conserving plumbing fixtures), they indirectly regulate and reduce GHG emissions. California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2016 standards improved upon the 2013 standards for new construction of, and additions and alterations to, residential, commercial, and industrial buildings. The 2019 Standards will continue to improve upon the 2016 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2019 Standards will go into effect on January 1, 2020.

The project would incorporate several energy efficiency design features that would comply with Title 24 requirements as well as the California Green Building Code standards that are consistent with the City's efficiency measures in Climate Action 2020. The project is an infill project within a developed area and would generate GHG emissions well below BAAQMD screening levels. The proposed project demonstrates consistency with the goals, measures, and emission reduction targets of Climate Action 2020 and would not conflict with the municipal measures. Consistent with Title 24, AB 32, SB 32, and the Climate Action 2020, the proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions. Impacts would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

CONCLUSION

Project implementation would result in less than significant short-term, long-term regional, and localized air quality impacts. Additionally, the proposed project would result in less than significant GHG impacts. No mitigation measures would be required. Therefore, the proposed project would not result in significant effects related to Section 15332(d) of the State CEQA Guidelines.

6 REFERENCES

1. Bay Area Air Quality Management District, *Planning Healthy Places*, 2016.
2. Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, 2017.
3. Bay Area Air Quality Management District, *Clean Air Plan*, 2017.
4. Bay Area Air Quality Management District, *Air Quality Standards and Attainment Status*, 2017.
5. Bay Area Air Quality Management District, *Current Rules*, 2017.
6. California Air Pollution Control Officers Association, *Health Effects*, <http://www.capcoa.org/health-effects/>, Accessed April 10, 2018.
7. California Air Resources Board (CARB), *Aerometric Data Analysis and Measurement System (ADAM) Top Four Summaries from 2015 to 2017*, 2018.
8. Sonoma County Regional Climate Protection Authority, *Climate Action 2020 and Beyond*, July 2016.
9. United States Environmental Protection Agency (U.S. EPA), *Policy Assessment for the Review of the Lead National Ambient Air Quality Standards*, 2013.
10. William Hezmalhalch Architects, Inc. (WHA), *Mockingbird Lane Site Plan*, September 18, 2018.
11. W-Trans, *Traffic Impact Study for the 853 Fourth Street West Project*, June 15, 2018.

Appendix A

Air Quality and Greenhouse Gas Emissions Data

Mockingbird - Sonoma-San Francisco County, Annual

Mockingbird
Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	32.00	Dwelling Unit	3.00	57,600.00	92

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	75
Climate Zone	4			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	427	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

- Project Characteristics - updated PG&E carbon intensity
- Land Use - site is 3 acres
- Construction Phase - Anticipated schedule
- Off-road Equipment - anticipated equipment
- Grading - site is 3 acres, 2,000 cy of import
- Vehicle Trips - Trip rate per traffic study
- Construction Off-road Equipment Mitigation - BAAQMD basic control measures
- Mobile Land Use Mitigation -
- Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	10.00	66.00
tblConstructionPhase	NumDays	6.00	130.00
tblConstructionPhase	PhaseEndDate	5/14/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	4/16/2020	10/21/2020
tblConstructionPhase	PhaseEndDate	6/13/2019	12/4/2019
tblConstructionPhase	PhaseEndDate	4/30/2020	12/18/2019
tblConstructionPhase	PhaseStartDate	5/1/2020	10/1/2020
tblConstructionPhase	PhaseStartDate	6/14/2019	12/19/2019
tblConstructionPhase	PhaseStartDate	4/17/2020	12/5/2019
tblGrading	AcresOfGrading	65.00	3.00
tblGrading	MaterialImported	0.00	2,000.00
tblLandUse	LotAcreage	10.39	3.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	427

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	0.1984	2.1163	1.2847	2.4000e-003	0.4315	0.1041	0.5356	0.2333	0.0959	0.3292	0.0000	215.9409	215.9409	0.0626	0.0000	217.5047
2020	0.6447	2.1223	1.8939	3.1300e-003	0.0125	0.1218	0.1343	3.3800e-003	0.1147	0.1181	0.0000	270.5527	270.5527	0.0611	0.0000	272.0807

Maximum	0.6447	2.1223	1.8939	3.1300e-003	0.4315	0.1218	0.5356	0.2333	0.1147	0.3292	0.0000	270.5527	270.5527	0.0626	0.0000	272.0807
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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	0.1984	2.1163	1.2847	2.4000e-003	0.1909	0.1041	0.2950	0.1014	0.0959	0.1974	0.0000	215.9407	215.9407	0.0626	0.0000	217.5045
2020	0.6447	2.1223	1.8939	3.1300e-003	0.0125	0.1218	0.1343	3.3800e-003	0.1147	0.1181	0.0000	270.5524	270.5524	0.0611	0.0000	272.0804
Maximum	0.6447	2.1223	1.8939	3.1300e-003	0.1909	0.1218	0.2950	0.1014	0.1147	0.1974	0.0000	270.5524	270.5524	0.0626	0.0000	272.0804

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	54.19	0.00	35.92	55.70	0.00	29.47	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2019	8-31-2019	1.0740	1.0740
2	9-1-2019	11-30-2019	1.0306	1.0306
3	12-1-2019	2-29-2020	0.6947	0.6947
4	3-1-2020	5-31-2020	0.7155	0.7155
5	6-1-2020	8-31-2020	0.7153	0.7153
6	9-1-2020	9-30-2020	0.2332	0.2332
		Highest	1.0740	1.0740

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	0.4614	6.8900e-003	0.5127	5.8000e-004		0.0409	0.0409		0.0409	0.0409	4.0676	1.3868	5.4544	8.0600e-003	2.3000e-004	5.7253
Energy	5.0200e-003	0.0429	0.0182	2.7000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	99.7772	99.7772	4.3600e-003	1.6100e-003	100.3673
Mobile	0.1120	0.5503	1.2451	3.3900e-003	0.2591	4.5700e-003	0.2637	0.0698	4.3100e-003	0.0741	0.0000	311.0050	311.0050	0.0146	0.0000	311.3701
Waste						0.0000	0.0000		0.0000	0.0000	7.8436	0.0000	7.8436	0.4635	0.0000	19.4321
Water						0.0000	0.0000		0.0000	0.0000	0.6615	3.0761	3.7375	0.0682	1.6500e-003	5.9321
Total	0.5784	0.6000	1.7760	4.2400e-003	0.2591	0.0489	0.3080	0.0698	0.0486	0.1184	12.5726	415.2451	427.8177	0.5587	3.4900e-003	442.8268

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	0.4614	6.8900e-003	0.5127	5.8000e-004		0.0409	0.0409		0.0409	0.0409	4.0676	1.3868	5.4544	8.0600e-003	2.3000e-004	5.7253
Energy	5.0200e-003	0.0429	0.0182	2.7000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	99.7772	99.7772	4.3600e-003	1.6100e-003	100.3673
Mobile	0.1108	0.5409	1.2203	3.3000e-003	0.2518	4.4600e-003	0.2563	0.0678	4.2000e-003	0.0720	0.0000	302.7554	302.7554	0.0143	0.0000	303.1132
Waste						0.0000	0.0000		0.0000	0.0000	7.8436	0.0000	7.8436	0.4635	0.0000	19.4321
Water						0.0000	0.0000		0.0000	0.0000	0.6615	3.0761	3.7375	0.0682	1.6500e-003	5.9321
Total	0.5772	0.5907	1.7512	4.1500e-003	0.2518	0.0488	0.3006	0.0678	0.0485	0.1163	12.5726	406.9955	419.5681	0.5584	3.4900e-003	434.5700

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.20	1.56	1.40	2.12	2.83	0.22	2.42	2.82	0.23	1.77	0.00	1.99	1.93	0.05	0.00	1.86

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2019	6/5/2019	5	3	
2	Grading	Grading	6/6/2019	12/4/2019	5	130	
3	Building Construction	Building Construction	12/19/2019	10/21/2020	5	220	
4	Paving	Paving	12/5/2019	12/18/2019	5	10	
5	Architectural Coating	Architectural Coating	10/1/2020	12/31/2020	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 3

Acres of Paving: 0

Residential Indoor: 116,640; Residential Outdoor: 38,880; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56

Off-Road	6.5000e-003	0.0684	0.0331	6.0000e-005		3.5900e-003	3.5900e-003		3.3000e-003	3.3000e-003	0.0000	5.1253	5.1253	1.6200e-003	0.0000	5.1658
Total	6.5000e-003	0.0684	0.0331	6.0000e-005	0.0271	3.5900e-003	0.0307	0.0149	3.3000e-003	0.0182	0.0000	5.1253	5.1253	1.6200e-003	0.0000	5.1658

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	1.4000e-004	1.1000e-004	1.0500e-003	0.0000	2.1000e-004	0.0000	2.1000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2014	0.2014	1.0000e-005	0.0000	0.2016
Total	1.4000e-004	1.1000e-004	1.0500e-003	0.0000	2.1000e-004	0.0000	2.1000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2014	0.2014	1.0000e-005	0.0000	0.2016

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					0.0116	0.0000	0.0116	6.3700e-003	0.0000	6.3700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-003	0.0684	0.0331	6.0000e-005		3.5900e-003	3.5900e-003		3.3000e-003	3.3000e-003	0.0000	5.1253	5.1253	1.6200e-003	0.0000	5.1658
Total	6.5000e-003	0.0684	0.0331	6.0000e-005	0.0116	3.5900e-003	0.0152	6.3700e-003	3.3000e-003	9.6700e-003	0.0000	5.1253	5.1253	1.6200e-003	0.0000	5.1658

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	1.4000e-004	1.1000e-004	1.0500e-003	0.0000	2.1000e-004	0.0000	2.1000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2014	0.2014	1.0000e-005	0.0000	0.2016
Total	1.4000e-004	1.1000e-004	1.0500e-003	0.0000	2.1000e-004	0.0000	2.1000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2014	0.2014	1.0000e-005	0.0000	0.2016

3.3 Grading - 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					0.3931	0.0000	0.3931	0.2154	0.0000	0.2154	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1677	1.8426	1.0591	1.9300e-003		0.0908	0.0908		0.0836	0.0836	0.0000	173.1747	173.1747	0.0548	0.0000	174.5445
Total	0.1677	1.8426	1.0591	1.9300e-003	0.3931	0.0908	0.4840	0.2154	0.0836	0.2989	0.0000	173.1747	173.1747	0.0548	0.0000	174.5445

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
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Worker	5.0600e-003	3.8200e-003	0.0379	8.0000e-005	7.6500e-003	6.0000e-005	7.7200e-003	2.0400e-003	6.0000e-005	2.1000e-003	0.0000	7.2733	7.2733	3.0000e-004	0.0000	7.2807
Total	6.2300e-003	0.0442	0.0462	1.8000e-004	9.7200e-003	2.6000e-004	9.9900e-003	2.6100e-003	2.5000e-004	2.8600e-003	0.0000	17.0006	17.0006	9.2000e-004	0.0000	17.0235

3.4 Building 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	0.0106	0.0949	0.0772	1.2000e-004		5.8000e-003	5.8000e-003		5.4600e-003	5.4600e-003	0.0000	10.5797	10.5797	2.5800e-003	0.0000	10.6441
Total	0.0106	0.0949	0.0772	1.2000e-004		5.8000e-003	5.8000e-003		5.4600e-003	5.4600e-003	0.0000	10.5797	10.5797	2.5800e-003	0.0000	10.6441

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	7.0000e-005	1.7900e-003	4.7000e-004	0.0000	9.0000e-005	1.0000e-005	1.0000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3492	0.3492	2.0000e-005	0.0000	0.3498
Worker	2.8000e-004	2.1000e-004	2.1000e-003	0.0000	4.2000e-004	0.0000	4.3000e-004	1.1000e-004	0.0000	1.2000e-004	0.0000	0.4028	0.4028	2.0000e-005	0.0000	0.4032
Total	3.5000e-004	2.0000e-003	2.5700e-003	0.0000	5.1000e-004	1.0000e-005	5.3000e-004	1.4000e-004	1.0000e-005	1.6000e-004	0.0000	0.7520	0.7520	4.0000e-005	0.0000	0.7530

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	0.0106	0.0949	0.0772	1.2000e-004		5.8000e-003	5.8000e-003		5.4600e-003	5.4600e-003	0.0000	10.5797	10.5797	2.5800e-003	0.0000	10.6441
Total	0.0106	0.0949	0.0772	1.2000e-004		5.8000e-003	5.8000e-003		5.4600e-003	5.4600e-003	0.0000	10.5797	10.5797	2.5800e-003	0.0000	10.6441

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	7.0000e-005	1.7900e-003	4.7000e-004	0.0000	9.0000e-005	1.0000e-005	1.0000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3492	0.3492	2.0000e-005	0.0000	0.3498
Worker	2.8000e-004	2.1000e-004	2.1000e-003	0.0000	4.2000e-004	0.0000	4.3000e-004	1.1000e-004	0.0000	1.2000e-004	0.0000	0.4028	0.4028	2.0000e-005	0.0000	0.4032
Total	3.5000e-004	2.0000e-003	2.5700e-003	0.0000	5.1000e-004	1.0000e-005	5.3000e-004	1.4000e-004	1.0000e-005	1.6000e-004	0.0000	0.7520	0.7520	4.0000e-005	0.0000	0.7530

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Off-Road	0.2236	2.0241	1.7775	2.8400e-003		0.1179	0.1179		0.1108	0.1108	0.0000	244.3485	244.3485	0.0596	0.0000	245.8388
Total	0.2236	2.0241	1.7775	2.8400e-003		0.1179	0.1179		0.1108	0.1108	0.0000	244.3485	244.3485	0.0596	0.0000	245.8388

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	1.2500e-003	0.0380	9.5900e-003	8.0000e-005	2.0500e-003	2.0000e-004	2.2500e-003	5.9000e-004	1.9000e-004	7.9000e-004	0.0000	8.1486	8.1486	5.0000e-004	0.0000	8.1611
Worker	6.0400e-003	4.3900e-003	0.0441	1.0000e-004	9.9400e-003	8.0000e-005	0.0100	2.6400e-003	7.0000e-005	2.7200e-003	0.0000	9.1527	9.1527	3.4000e-004	0.0000	9.1611
Total	7.2900e-003	0.0424	0.0537	1.8000e-004	0.0120	2.8000e-004	0.0123	3.2300e-003	2.6000e-004	3.5100e-003	0.0000	17.3013	17.3013	8.4000e-004	0.0000	17.3222

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	0.2236	2.0241	1.7775	2.8400e-003		0.1179	0.1179		0.1108	0.1108	0.0000	244.3482	244.3482	0.0596	0.0000	245.8386
Total	0.2236	2.0241	1.7775	2.8400e-003		0.1179	0.1179		0.1108	0.1108	0.0000	244.3482	244.3482	0.0596	0.0000	245.8386

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	1.2500e-003	0.0380	9.5900e-003	8.0000e-005	2.0500e-003	2.0000e-004	2.2500e-003	5.9000e-004	1.9000e-004	7.9000e-004	0.0000	8.1486	8.1486	5.0000e-004	0.0000	8.1611
Worker	6.0400e-003	4.3900e-003	0.0441	1.0000e-004	9.9400e-003	8.0000e-005	0.0100	2.6400e-003	7.0000e-005	2.7200e-003	0.0000	9.1527	9.1527	3.4000e-004	0.0000	9.1611
Total	7.2900e-003	0.0424	0.0537	1.8000e-004	0.0120	2.8000e-004	0.0123	3.2300e-003	2.6000e-004	3.5100e-003	0.0000	17.3013	17.3013	8.4000e-004	0.0000	17.3222

3.5 Paving - 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	6.3400e-003	0.0638	0.0616	9.0000e-005		3.6000e-003	3.6000e-003		3.3200e-003	3.3200e-003	0.0000	8.3612	8.3612	2.5700e-003	0.0000	8.4255
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	6.3400e-003	0.0638	0.0616	9.0000e-005		3.6000e-003	3.6000e-003		3.3200e-003	3.3200e-003	0.0000	8.3612	8.3612	2.5700e-003	0.0000	8.4255

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	5.2000e-004	3.9000e-004	3.8900e-003	1.0000e-005	7.8000e-004	1.0000e-005	7.9000e-004	2.1000e-004	1.0000e-005	2.2000e-004	0.0000	0.7460	0.7460	3.0000e-005	0.0000	0.7467
Total	5.2000e-004	3.9000e-004	3.8900e-003	1.0000e-005	7.8000e-004	1.0000e-005	7.9000e-004	2.1000e-004	1.0000e-005	2.2000e-004	0.0000	0.7460	0.7460	3.0000e-005	0.0000	0.7467

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	6.3400e-003	0.0638	0.0616	9.0000e-005		3.6000e-003	3.6000e-003		3.3200e-003	3.3200e-003	0.0000	8.3611	8.3611	2.5700e-003	0.0000	8.4255
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	6.3400e-003	0.0638	0.0616	9.0000e-005		3.6000e-003	3.6000e-003		3.3200e-003	3.3200e-003	0.0000	8.3611	8.3611	2.5700e-003	0.0000	8.4255

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	5.2000e-004	3.9000e-004	3.8900e-003	1.0000e-005	7.8000e-004	1.0000e-005	7.9000e-004	2.1000e-004	1.0000e-005	2.2000e-004	0.0000	0.7460	0.7460	3.0000e-005	0.0000	0.7467
Total	5.2000e-004	3.9000e-004	3.8900e-003	1.0000e-005	7.8000e-004	1.0000e-005	7.9000e-004	2.1000e-004	1.0000e-005	2.2000e-004	0.0000	0.7460	0.7460	3.0000e-005	0.0000	0.7467

3.6 Architectural Coating - 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	0.4055						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9900e-003	0.0556	0.0604	1.0000e-004		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	8.4257	8.4257	6.5000e-004	0.0000	8.4421
Total	0.4135	0.0556	0.0604	1.0000e-004		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	8.4257	8.4257	6.5000e-004	0.0000	8.4421

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.3000e-004	2.3000e-003	1.0000e-005	5.2000e-004	0.0000	5.2000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4772	0.4772	2.0000e-005	0.0000	0.4776

Total	3.1000e-004	2.3000e-004	2.3000e-003	1.0000e-005	5.2000e-004	0.0000	5.2000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4772	0.4772	2.0000e-005	0.0000	0.4776
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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	0.4055					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9900e-003	0.0556	0.0604	1.0000e-004		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	8.4257	8.4257	6.5000e-004	0.0000	8.4420
Total	0.4135	0.0556	0.0604	1.0000e-004		3.6600e-003	3.6600e-003		3.6600e-003	3.6600e-003	0.0000	8.4257	8.4257	6.5000e-004	0.0000	8.4420

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.3000e-004	2.3000e-003	1.0000e-005	5.2000e-004	0.0000	5.2000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4772	0.4772	2.0000e-005	0.0000	0.4776
Total	3.1000e-004	2.3000e-004	2.3000e-003	1.0000e-005	5.2000e-004	0.0000	5.2000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4772	0.4772	2.0000e-005	0.0000	0.4776

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

	ROG	NOx	CO	SO2	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	0.1108	0.5409	1.2203	3.3000e-003	0.2518	4.4600e-003	0.2563	0.0678	4.2000e-003	0.0720	0.0000	302.7554	302.7554	0.0143	0.0000	303.1132
Unmitigated	0.1120	0.5503	1.2451	3.3900e-003	0.2591	4.5700e-003	0.2637	0.0698	4.3100e-003	0.0741	0.0000	311.0050	311.0050	0.0146	0.0000	311.3701

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	304.64	317.12	275.84	698,214	678,471
Total	304.64	317.12	275.84	698,214	678,471

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190

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	50.1444	50.1444	3.4100e-003	7.0000e-004	50.4395
Electricity Unmitigated							0.0000	0.0000		0.0000	0.0000	50.1444	50.1444	3.4100e-003	7.0000e-004	50.4395
NaturalGas Mitigated	5.0200e-003	0.0429	0.0182	2.7000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	49.6328	49.6328	9.5000e-004	9.1000e-004	49.9277
NaturalGas Unmitigated	5.0200e-003	0.0429	0.0182	2.7000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	49.6328	49.6328	9.5000e-004	9.1000e-004	49.9277

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					
Single Family Housing	930083	5.0200e-003	0.0429	0.0182	2.7000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	49.6328	49.6328	9.5000e-004	9.1000e-004	49.9277
Total		5.0200e-003	0.0429	0.0182	2.7000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	49.6328	49.6328	9.5000e-004	9.1000e-004	49.9277

Mitigated

	Natural Gas 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					
Single Family Housing	930083	5.0200e-003	0.0429	0.0182	2.7000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	49.6328	49.6328	9.5000e-004	9.1000e-004	49.9277
Total		5.0200e-003	0.0429	0.0182	2.7000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	49.6328	49.6328	9.5000e-004	9.1000e-004	49.9277

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	258898	50.1444	3.4100e-003	7.0000e-004	50.4395
Total		50.1444	3.4100e-003	7.0000e-004	50.4395

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	258898	50.1444	3.4100e-003	7.0000e-004	50.4395

Total		50.1444	3.4100e-003	7.0000e-004	50.4395
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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	0.4614	6.8900e-003	0.5127	5.8000e-004		0.0409	0.0409		0.0409	0.0409	4.0676	1.3868	5.4544	8.0600e-003	2.3000e-004	5.7253
Unmitigated	0.4614	6.8900e-003	0.5127	5.8000e-004		0.0409	0.0409		0.0409	0.0409	4.0676	1.3868	5.4544	8.0600e-003	2.3000e-004	5.7253

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	0.0406					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2250					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1886	4.1300e-003	0.2743	5.7000e-004		0.0396	0.0396		0.0396	0.0396	4.0676	0.9987	5.0663	7.6900e-003	2.3000e-004	5.3277

Landscaping	7.2600e-003	2.7600e-003	0.2384	1.0000e-005		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003	0.0000	0.3881	0.3881	3.8000e-004	0.0000	0.3976
Total	0.4614	6.8900e-003	0.5127	5.8000e-004		0.0409	0.0409		0.0409	0.0409	4.0676	1.3868	5.4544	8.0700e-003	2.3000e-004	5.7253

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	0.0406					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2250					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1886	4.1300e-003	0.2743	5.7000e-004		0.0396	0.0396		0.0396	0.0396	4.0676	0.9987	5.0663	7.6900e-003	2.3000e-004	5.3277
Landscaping	7.2600e-003	2.7600e-003	0.2384	1.0000e-005		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003	0.0000	0.3881	0.3881	3.8000e-004	0.0000	0.3976
Total	0.4614	6.8900e-003	0.5127	5.8000e-004		0.0409	0.0409		0.0409	0.0409	4.0676	1.3868	5.4544	8.0700e-003	2.3000e-004	5.7253

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3.7375	0.0682	1.6500e-003	5.9321
Unmitigated	3.7375	0.0682	1.6500e-003	5.9321

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	2.08493 / 1.31441	3.7375	0.0682	1.6500e-003	5.9321
Total		3.7375	0.0682	1.6500e-003	5.9321

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	2.08493 / 1.31441	3.7375	0.0682	1.6500e-003	5.9321
Total		3.7375	0.0682	1.6500e-003	5.9321

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	7.8436	0.4635	0.0000	19.4321
Unmitigated	7.8436	0.4635	0.0000	19.4321

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	38.64	7.8436	0.4635	0.0000	19.4321
Total		7.8436	0.4635	0.0000	19.4321

Mitigated

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

Single Family Housing	38.64	7.8436	0.4635	0.0000	19.4321
Total		7.8436	0.4635	0.0000	19.4321

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

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

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

Equipment Type	Number
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11.0 Vegetation

Mockingbird - Sonoma-San Francisco County, Summer

Mockingbird
Sonoma-San Francisco County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	32.00	Dwelling Unit	3.00	57,600.00	92

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	75
Climate Zone	4			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	427	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

- Project Characteristics - updated PG&E carbon intensity
- Land Use - site is 3 acres
- Construction Phase - Anticipated schedule
- Off-road Equipment - anticipated equipment
- Grading - site is 3 acres, 2,000 cy of import
- Vehicle Trips - Trip rate per traffic study
- Construction Off-road Equipment Mitigation - BAAQMD basic control measures
- Mobile Land Use Mitigation -
- Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	10.00	66.00
tblConstructionPhase	NumDays	6.00	130.00
tblConstructionPhase	PhaseEndDate	5/14/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	4/16/2020	10/21/2020
tblConstructionPhase	PhaseEndDate	6/13/2019	12/4/2019
tblConstructionPhase	PhaseEndDate	4/30/2020	12/18/2019
tblConstructionPhase	PhaseStartDate	5/1/2020	10/1/2020
tblConstructionPhase	PhaseStartDate	6/14/2019	12/19/2019
tblConstructionPhase	PhaseStartDate	4/17/2020	12/5/2019
tblGrading	AcresOfGrading	65.00	3.00
tblGrading	MaterialImported	0.00	2,000.00
tblLandUse	LotAcreage	10.39	3.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	427

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	4.4308	45.6356	22.7999	0.0396	18.2141	2.3916	20.6057	9.9699	2.2002	12.1701	0.0000	3,923.9517	3,923.9517	1.1979	0.0000	3,953.8998
2020	14.7290	21.2694	19.2796	0.0319	0.1352	1.2308	1.3660	0.0363	1.1639	1.2002	0.0000	3,039.1542	3,039.1542	0.6540	0.0000	3,055.5033

Maximum	14.7290	45.6356	22.7999	0.0396	18.2141	2.3916	20.6057	9.9699	2.2002	12.1701	0.0000	3,923.9517	3,923.9517	1.1979	0.0000	3,953.8998
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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	4.4308	45.6356	22.7999	0.0396	7.8712	2.3916	10.2628	4.2846	2.2002	6.4848	0.0000	3,923.9517	3,923.9517	1.1979	0.0000	3,953.8998
2020	14.7290	21.2694	19.2796	0.0319	0.1352	1.2308	1.3660	0.0363	1.1639	1.2002	0.0000	3,039.1542	3,039.1542	0.6540	0.0000	3,055.5033
Maximum	14.7290	45.6356	22.7999	0.0396	7.8712	2.3916	10.2628	4.2846	2.2002	6.4848	0.0000	3,923.9517	3,923.9517	1.1979	0.0000	3,953.8998

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	56.37	0.00	47.07	56.82	0.00	42.52	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	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935
Energy	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
Mobile	0.7199	3.0680	7.2713	0.0205	1.5620	0.0263	1.5882	0.4188	0.0248	0.4436		2,070.3007	2,070.3007	0.0929		2,072.6232

Total	35.4451	3.9720	52.9093	0.1029	1.5620	6.1246	7.6865	0.4188	6.1231	6.5419	652.1068	2,572.4864	3,224.5933	0.9096	0.0515	3,262.6832
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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	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935
Energy	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
Mobile	0.7133	3.0167	7.1141	0.0199	1.5178	0.0256	1.5434	0.4070	0.0242	0.4311		2,015.3455	2,015.3455	0.0910		2,017.6202
Total	35.4384	3.9207	52.7520	0.1023	1.5178	6.1239	7.6417	0.4070	6.1225	6.5294	652.1068	2,517.5312	3,169.6381	0.9077	0.0515	3,207.6801

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.02	1.29	0.30	0.53	2.83	0.01	0.58	2.83	0.01	0.19	0.00	2.14	1.70	0.21	0.00	1.69

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2019	6/5/2019	5	3	
2	Grading	Grading	6/6/2019	12/4/2019	5	130	
3	Building Construction	Building Construction	12/19/2019	10/21/2020	5	220	
4	Paving	Paving	12/5/2019	12/18/2019	5	10	
5	Architectural Coating	Architectural Coating	10/1/2020	12/31/2020	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 3

Acres of Paving: 0

Residential Indoor: 116,640; Residential Outdoor: 38,880; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	12.00	3.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

- Replace Ground Cover
- Water Exposed Area
- Water Unpaved Roads
- Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.4529	3,766.4529	1.1917		3,796.2445
Total	4.3350	45.5727	22.0630	0.0380	18.0663	2.3904	20.4566	9.9307	2.1991	12.1298		3,766.4529	3,766.4529	1.1917		3,796.2445

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	0.0958	0.0629	0.7368	1.5800e-003	0.1479	1.1900e-003	0.1491	0.0392	1.1000e-003	0.0403		157.4988	157.4988	6.2600e-003		157.6553
Total	0.0958	0.0629	0.7368	1.5800e-003	0.1479	1.1900e-003	0.1491	0.0392	1.1000e-003	0.0403		157.4988	157.4988	6.2600e-003		157.6553

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					7.7233	0.0000	7.7233	4.2454	0.0000	4.2454			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445
Total	4.3350	45.5727	22.0630	0.0380	7.7233	2.3904	10.1137	4.2454	2.1991	6.4445	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445

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	0.0958	0.0629	0.7368	1.5800e-003	0.1479	1.1900e-003	0.1491	0.0392	1.1000e-003	0.0403		157.4988	157.4988	6.2600e-003		157.6553
Total	0.0958	0.0629	0.7368	1.5800e-003	0.1479	1.1900e-003	0.1491	0.0392	1.1000e-003	0.0403		157.4988	157.4988	6.2600e-003		157.6553

3.3 Grading - 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					6.0483	0.0000	6.0483	3.3131	0.0000	3.3131			0.0000				0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856		2,936.8068	2,936.8068	0.9292			2,960.0361
Total	2.5805	28.3480	16.2934	0.0297	6.0483	1.3974	7.4457	3.3131	1.2856	4.5987		2,936.8068	2,936.8068	0.9292			2,960.0361

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	0.0178	0.6100	0.1230	1.5400e-003	0.0332	3.0600e-003	0.0363	9.0700e-003	2.9200e-003	0.0120		165.8754	165.8754	0.0103			166.1318
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	0.0798	0.0524	0.6140	1.3200e-003	0.1232	1.0000e-003	0.1242	0.0327	9.2000e-004	0.0336		131.2490	131.2490	5.2200e-003			131.3794
Total	0.0976	0.6624	0.7370	2.8600e-003	0.1564	4.0600e-003	0.1605	0.0418	3.8400e-003	0.0456		297.1244	297.1244	0.0155			297.5112

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					2.5857	0.0000	2.5857	1.4164	0.0000	1.4164			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361
Total	2.5805	28.3480	16.2934	0.0297	2.5857	1.3974	3.9830	1.4164	1.2856	2.7019	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361

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	0.0178	0.6100	0.1230	1.5400e-003	0.0332	3.0600e-003	0.0363	9.0700e-003	2.9200e-003	0.0120		165.8754	165.8754	0.0103		166.1318
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	0.0798	0.0524	0.6140	1.3200e-003	0.1232	1.0000e-003	0.1242	0.0327	9.2000e-004	0.0336		131.2490	131.2490	5.2200e-003		131.3794
Total	0.0976	0.6624	0.7370	2.8600e-003	0.1564	4.0600e-003	0.1605	0.0418	3.8400e-003	0.0456		297.1244	297.1244	0.0155		297.5112

3.4 Building 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	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635

Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
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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	0.0148	0.3926	0.0991	8.1000e-004	0.0202	3.0600e-003	0.0233	5.8100e-003	2.9300e-003	8.7400e-003		86.2864	86.2864	5.4800e-003		86.4235
Worker	0.0639	0.0419	0.4912	1.0600e-003	0.0986	8.0000e-004	0.0994	0.0262	7.3000e-004	0.0269		104.9992	104.9992	4.1700e-003		105.1035
Total	0.0786	0.4345	0.5903	1.8700e-003	0.1188	3.8600e-003	0.1226	0.0320	3.6600e-003	0.0356		191.2856	191.2856	9.6500e-003		191.5271

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	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635

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	0.0148	0.3926	0.0991	8.1000e-004	0.0202	3.0600e-003	0.0233	5.8100e-003	2.9300e-003	8.7400e-003		86.2864	86.2864	5.4800e-003		86.4235
Worker	0.0639	0.0419	0.4912	1.0600e-003	0.0986	8.0000e-004	0.0994	0.0262	7.3000e-004	0.0269		104.9992	104.9992	4.1700e-003		105.1035
Total	0.0786	0.4345	0.5903	1.8700e-003	0.1188	3.8600e-003	0.1226	0.0320	3.6600e-003	0.0356		191.2856	191.2856	9.6500e-003		191.5271

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345

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
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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	0.0000
Vendor	0.0116	0.3561	0.0855	8.1000e-004	0.0202	1.9000e-003	0.0221	5.8000e-003	1.8200e-003	7.6200e-003	85.9132	85.9132	5.0400e-003	86.0391	
Worker	0.0587	0.0371	0.4408	1.0200e-003	0.0986	7.7000e-004	0.0993	0.0262	7.1000e-004	0.0269	101.7685	101.7685	3.6700e-003	101.8601	
Total	0.0702	0.3933	0.5262	1.8300e-003	0.1188	2.6700e-003	0.1214	0.0320	2.5300e-003	0.0345	187.6817	187.6817	8.7100e-003	187.8993	

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	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345

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	0.0116	0.3561	0.0855	8.1000e-004	0.0202	1.9000e-003	0.0221	5.8000e-003	1.8200e-003	7.6200e-003	85.9132	85.9132	5.0400e-003	86.0391		

Worker	0.0587	0.0371	0.4408	1.0200e-003	0.0986	7.7000e-004	0.0993	0.0262	7.1000e-004	0.0269		101.7685	101.7685	3.6700e-003		101.8601
Total	0.0702	0.3933	0.5262	1.8300e-003	0.1188	2.6700e-003	0.1214	0.0320	2.5300e-003	0.0345		187.6817	187.6817	8.7100e-003		187.8993

3.5 Paving - 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	1.2679	12.7604	12.3130	0.0189		0.7196	0.7196		0.6637	0.6637		1,843.3191	1,843.3191	0.5671		1,857.4966
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.2679	12.7604	12.3130	0.0189		0.7196	0.7196		0.6637	0.6637		1,843.3191	1,843.3191	0.5671		1,857.4966

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	0.1064	0.0699	0.8187	1.7600e-003	0.1643	1.3300e-003	0.1656	0.0436	1.2200e-003	0.0448		174.9987	174.9987	6.9500e-003		175.1725
Total	0.1064	0.0699	0.8187	1.7600e-003	0.1643	1.3300e-003	0.1656	0.0436	1.2200e-003	0.0448		174.9987	174.9987	6.9500e-003		175.1725

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	1.2679	12.7604	12.3130	0.0189		0.7196	0.7196		0.6637	0.6637	0.0000	1,843.3191	1,843.3191	0.5671		1,857.4966
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.2679	12.7604	12.3130	0.0189		0.7196	0.7196		0.6637	0.6637	0.0000	1,843.3191	1,843.3191	0.5671		1,857.4966

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	0.1064	0.0699	0.8187	1.7600e-003	0.1643	1.3300e-003	0.1656	0.0436	1.2200e-003	0.0448		174.9987	174.9987	6.9500e-003		175.1725
Total	0.1064	0.0699	0.8187	1.7600e-003	0.1643	1.3300e-003	0.1656	0.0436	1.2200e-003	0.0448		174.9987	174.9987	6.9500e-003		175.1725

3.6 Architectural Coating - 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
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Category	lb/day								lb/day						
Archit. Coating	12.2870					0.0000	0.0000		0.0000	0.0000			0.0000		0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218	281.9928
Total	12.5291	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218	281.9928

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	9.7800e-003	6.1900e-003	0.0735	1.7000e-004	0.0164	1.3000e-004	0.0166	4.3600e-003	1.2000e-004	4.4800e-003		16.9614	16.9614	6.1000e-004		16.9767
Total	9.7800e-003	6.1900e-003	0.0735	1.7000e-004	0.0164	1.3000e-004	0.0166	4.3600e-003	1.2000e-004	4.4800e-003		16.9614	16.9614	6.1000e-004		16.9767

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	12.2870					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928

Total	12.5291	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
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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	9.7800e-003	6.1900e-003	0.0735	1.7000e-004	0.0164	1.3000e-004	0.0166	4.3600e-003	1.2000e-004	4.4800e-003		16.9614	16.9614	6.1000e-004			16.9767
Total	9.7800e-003	6.1900e-003	0.0735	1.7000e-004	0.0164	1.3000e-004	0.0166	4.3600e-003	1.2000e-004	4.4800e-003		16.9614	16.9614	6.1000e-004			16.9767

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

	ROG	NOx	CO	SO2	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	0.7133	3.0167	7.1141	0.0199	1.5178	0.0256	1.5434	0.4070	0.0242	0.4311		2,015.3455	2,015.3455	0.0910			2,017.6202
Unmitigated	0.7199	3.0680	7.2713	0.0205	1.5620	0.0263	1.5882	0.4188	0.0248	0.4436		2,070.3007	2,070.3007	0.0929			2,072.6232

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	304.64	317.12	275.84	698,214	678,471
Total	304.64	317.12	275.84	698,214	678,471

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
NaturalGas Mitigated	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
NaturalGas Unmitigated	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665

5.2 Energy by Land Use - Natural Gas

Unmitigated

	Natural Gas 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					
Single Family Housing	2548.17	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
Total		0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665

Mitigated

	Natural Gas 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					
Single Family Housing	2.54817	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
Total		0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665

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	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935
Unmitigated	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935

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	0.2222					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2326					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	33.1622	0.6385	42.8892	0.0808		6.0648	6.0648		6.0648	6.0648	652.1068	197.6471	849.7539	0.8063	0.0460	883.6239
Landscaping	0.0807	0.0306	2.6488	1.4000e-004		0.0146	0.0146		0.0146	0.0146		4.7537	4.7537	4.6400e-003		4.8696
Total	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935

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	0.2222					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2326					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	33.1622	0.6385	42.8892	0.0808		6.0648	6.0648		6.0648	6.0648	652.1068	197.6471	849.7539	0.8063	0.0460	883.6239
Landscaping	0.0807	0.0306	2.6488	1.4000e-004		0.0146	0.0146		0.0146	0.0146		4.7537	4.7537	4.6400e-003		4.8696
Total	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935

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
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

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

Equipment Type	Number
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11.0 Vegetation

Mockingbird - Sonoma-San Francisco County, Winter

Mockingbird
Sonoma-San Francisco County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	32.00	Dwelling Unit	3.00	57,600.00	92

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	75
Climate Zone	4			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	427	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

- Project Characteristics - updated PG&E carbon intensity
- Land Use - site is 3 acres
- Construction Phase - Anticipated schedule
- Off-road Equipment - anticipated equipment
- Grading - site is 3 acres, 2,000 cy of import
- Vehicle Trips - Trip rate per traffic study
- Construction Off-road Equipment Mitigation - BAAQMD basic control measures
- Mobile Land Use Mitigation -
- Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	10.00	66.00
tblConstructionPhase	NumDays	6.00	130.00
tblConstructionPhase	PhaseEndDate	5/14/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	4/16/2020	10/21/2020
tblConstructionPhase	PhaseEndDate	6/13/2019	12/4/2019
tblConstructionPhase	PhaseEndDate	4/30/2020	12/18/2019
tblConstructionPhase	PhaseStartDate	5/1/2020	10/1/2020
tblConstructionPhase	PhaseStartDate	6/14/2019	12/19/2019
tblConstructionPhase	PhaseStartDate	4/17/2020	12/5/2019
tblGrading	AcresOfGrading	65.00	3.00
tblGrading	MaterialImported	0.00	2,000.00
tblLandUse	LotAcreage	10.39	3.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	427

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	4.4384	45.6507	22.7858	0.0395	18.2141	2.3916	20.6057	9.9699	2.2002	12.1701	0.0000	3,912.8330	3,912.8330	1.1977	0.0000	3,942.7761
2020	14.7350	21.2839	19.2797	0.0318	0.1352	1.2308	1.3660	0.0363	1.1640	1.2003	0.0000	3,028.9227	3,028.9227	0.6542	0.0000	3,045.2778

Maximum	14.7350	45.6507	22.7858	0.0395	18.2141	2.3916	20.6057	9.9699	2.2002	12.1701	0.0000	3,912.8330	3,912.8330	1.1977	0.0000	3,942.7761
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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	4.4384	45.6507	22.7858	0.0395	7.8712	2.3916	10.2628	4.2846	2.2002	6.4848	0.0000	3,912.8330	3,912.8330	1.1977	0.0000	3,942.7761
2020	14.7350	21.2839	19.2797	0.0318	0.1352	1.2308	1.3660	0.0363	1.1640	1.2003	0.0000	3,028.9227	3,028.9227	0.6542	0.0000	3,045.2778
Maximum	14.7350	45.6507	22.7858	0.0395	7.8712	2.3916	10.2628	4.2846	2.2002	6.4848	0.0000	3,912.8330	3,912.8330	1.1977	0.0000	3,942.7761

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	56.37	0.00	47.07	56.82	0.00	42.52	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	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935
Energy	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
Mobile	0.6447	3.2511	7.5550	0.0194	1.5620	0.0265	1.5885	0.4188	0.0250	0.4438		1,957.1828	1,957.1828	0.0953		1,959.5640

Total	35.3698	4.1551	53.1930	0.1018	1.5620	6.1248	7.6868	0.4188	6.1233	6.5422	652.1068	2,459.3685	3,111.4754	0.9119	0.0515	3,149.6240
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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	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935
Energy	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
Mobile	0.6381	3.1947	7.4111	0.0189	1.5178	0.0259	1.5436	0.4070	0.0244	0.4314		1,905.1357	1,905.1357	0.0934		1,907.4713
Total	35.3632	4.0987	53.0491	0.1013	1.5178	6.1242	7.6420	0.4070	6.1227	6.5297	652.1068	2,407.3214	3,059.4283	0.9101	0.0515	3,097.5312

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.02	1.36	0.27	0.50	2.83	0.01	0.58	2.83	0.01	0.19	0.00	2.12	1.67	0.20	0.00	1.65

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2019	6/5/2019	5	3	
2	Grading	Grading	6/6/2019	12/4/2019	5	130	
3	Building Construction	Building Construction	12/19/2019	10/21/2020	5	220	
4	Paving	Paving	12/5/2019	12/18/2019	5	10	
5	Architectural Coating	Architectural Coating	10/1/2020	12/31/2020	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 3

Acres of Paving: 0

Residential Indoor: 116,640; Residential Outdoor: 38,880; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	12.00	3.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.4529	3,766.4529	1.1917		3,796.2445
Total	4.3350	45.5727	22.0630	0.0380	18.0663	2.3904	20.4566	9.9307	2.1991	12.1298		3,766.4529	3,766.4529	1.1917		3,796.2445

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	0.1034	0.0779	0.7228	1.4700e-003	0.1479	1.1900e-003	0.1491	0.0392	1.1000e-003	0.0403		146.3802	146.3802	6.0600e-003		146.5315
Total	0.1034	0.0779	0.7228	1.4700e-003	0.1479	1.1900e-003	0.1491	0.0392	1.1000e-003	0.0403		146.3802	146.3802	6.0600e-003		146.5315

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					7.7233	0.0000	7.7233	4.2454	0.0000	4.2454			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445
Total	4.3350	45.5727	22.0630	0.0380	7.7233	2.3904	10.1137	4.2454	2.1991	6.4445	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445

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	0.1034	0.0779	0.7228	1.4700e-003	0.1479	1.1900e-003	0.1491	0.0392	1.1000e-003	0.0403		146.3802	146.3802	6.0600e-003		146.5315
Total	0.1034	0.0779	0.7228	1.4700e-003	0.1479	1.1900e-003	0.1491	0.0392	1.1000e-003	0.0403		146.3802	146.3802	6.0600e-003		146.5315

3.3 Grading - 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					6.0483	0.0000	6.0483	3.3131	0.0000	3.3131			0.0000				0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856		2,936.8068	2,936.8068	0.9292			2,960.0361
Total	2.5805	28.3480	16.2934	0.0297	6.0483	1.3974	7.4457	3.3131	1.2856	4.5987		2,936.8068	2,936.8068	0.9292			2,960.0361

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	0.0183	0.6258	0.1327	1.5200e-003	0.0332	3.1400e-003	0.0363	9.0700e-003	3.0000e-003	0.0121		163.7006	163.7006	0.0108			163.9698
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	0.0862	0.0650	0.6023	1.2300e-003	0.1232	1.0000e-003	0.1242	0.0327	9.2000e-004	0.0336		121.9835	121.9835	5.0500e-003			122.1096
Total	0.1044	0.6908	0.7349	2.7500e-003	0.1564	4.1400e-003	0.1606	0.0418	3.9200e-003	0.0457		285.6841	285.6841	0.0158			286.0794

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					2.5857	0.0000	2.5857	1.4164	0.0000	1.4164			0.0000			0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361
Total	2.5805	28.3480	16.2934	0.0297	2.5857	1.3974	3.9830	1.4164	1.2856	2.7019	0.0000	2,936.8068	2,936.8068	0.9292		2,960.0361

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	0.0183	0.6258	0.1327	1.5200e-003	0.0332	3.1400e-003	0.0363	9.0700e-003	3.0000e-003	0.0121		163.7006	163.7006	0.0108		163.9698
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	0.0862	0.0650	0.6023	1.2300e-003	0.1232	1.0000e-003	0.1242	0.0327	9.2000e-004	0.0336		121.9835	121.9835	5.0500e-003		122.1096
Total	0.1044	0.6908	0.7349	2.7500e-003	0.1564	4.1400e-003	0.1606	0.0418	3.9200e-003	0.0457		285.6841	285.6841	0.0158		286.0794

3.4 Building 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	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635

Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
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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	0.0155	0.3982	0.1129	8.0000e-004	0.0202	3.1400e-003	0.0233	5.8100e-003	3.0000e-003	8.8100e-003		84.5033	84.5033	5.9300e-003		84.6516
Worker	0.0689	0.0520	0.4818	9.8000e-004	0.0986	8.0000e-004	0.0994	0.0262	7.3000e-004	0.0269		97.5868	97.5868	4.0400e-003		97.6877
Total	0.0845	0.4502	0.5947	1.7800e-003	0.1188	3.9400e-003	0.1227	0.0320	3.7300e-003	0.0357		182.0901	182.0901	9.9700e-003		182.3393

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	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635

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	0.0155	0.3982	0.1129	8.0000e-004	0.0202	3.1400e-003	0.0233	5.8100e-003	3.0000e-003	8.8100e-003		84.5033	84.5033	5.9300e-003		84.6516
Worker	0.0689	0.0520	0.4818	9.8000e-004	0.0986	8.0000e-004	0.0994	0.0262	7.3000e-004	0.0269		97.5868	97.5868	4.0400e-003		97.6877
Total	0.0845	0.4502	0.5947	1.7800e-003	0.1188	3.9400e-003	0.1227	0.0320	3.7300e-003	0.0357		182.0901	182.0901	9.9700e-003		182.3393

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345

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
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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	0.0000
Vendor	0.0122	0.3604	0.0973	7.9000e-004	0.0202	1.9400e-003	0.0221	5.8000e-003	1.8600e-003	7.6600e-003		84.0740	84.0740	5.4400e-003	84.2100
Worker	0.0633	0.0460	0.4307	9.5000e-004	0.0986	7.7000e-004	0.0993	0.0262	7.1000e-004	0.0269		94.5751	94.5751	3.5300e-003	94.6633
Total	0.0754	0.4064	0.5280	1.7400e-003	0.1188	2.7100e-003	0.1215	0.0320	2.5700e-003	0.0345		178.6491	178.6491	8.9700e-003	178.8733

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	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345

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	0.0122	0.3604	0.0973	7.9000e-004	0.0202	1.9400e-003	0.0221	5.8000e-003	1.8600e-003	7.6600e-003		84.0740	84.0740	5.4400e-003		84.2100

Worker	0.0633	0.0460	0.4307	9.5000e-004	0.0986	7.7000e-004	0.0993	0.0262	7.1000e-004	0.0269		94.5751	94.5751	3.5300e-003		94.6633
Total	0.0754	0.4064	0.5280	1.7400e-003	0.1188	2.7100e-003	0.1215	0.0320	2.5700e-003	0.0345		178.6491	178.6491	8.9700e-003		178.8733

3.5 Paving - 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	1.2679	12.7604	12.3130	0.0189		0.7196	0.7196		0.6637	0.6637		1,843.3191	1,843.3191	0.5671		1,857.4966
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.2679	12.7604	12.3130	0.0189		0.7196	0.7196		0.6637	0.6637		1,843.3191	1,843.3191	0.5671		1,857.4966

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	0.1149	0.0866	0.8031	1.6400e-003	0.1643	1.3300e-003	0.1656	0.0436	1.2200e-003	0.0448		162.6446	162.6446	6.7300e-003		162.8128
Total	0.1149	0.0866	0.8031	1.6400e-003	0.1643	1.3300e-003	0.1656	0.0436	1.2200e-003	0.0448		162.6446	162.6446	6.7300e-003		162.8128

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	1.2679	12.7604	12.3130	0.0189		0.7196	0.7196		0.6637	0.6637	0.0000	1,843.3191	1,843.3191	0.5671			1,857.4966
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000				0.0000
Total	1.2679	12.7604	12.3130	0.0189		0.7196	0.7196		0.6637	0.6637	0.0000	1,843.3191	1,843.3191	0.5671			1,857.4966

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	0.1149	0.0866	0.8031	1.6400e-003	0.1643	1.3300e-003	0.1656	0.0436	1.2200e-003	0.0448		162.6446	162.6446	6.7300e-003			162.8128
Total	0.1149	0.0866	0.8031	1.6400e-003	0.1643	1.3300e-003	0.1656	0.0436	1.2200e-003	0.0448		162.6446	162.6446	6.7300e-003			162.8128

3.6 Architectural Coating - 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
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Category	lb/day								lb/day						
Archit. Coating	12.2870					0.0000	0.0000		0.0000	0.0000			0.0000		0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218	281.9928
Total	12.5291	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218	281.9928

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	0.0105	7.6700e-003	0.0718	1.6000e-004	0.0164	1.3000e-004	0.0166	4.3600e-003	1.2000e-004	4.4800e-003		15.7625	15.7625	5.9000e-004		15.7772
Total	0.0105	7.6700e-003	0.0718	1.6000e-004	0.0164	1.3000e-004	0.0166	4.3600e-003	1.2000e-004	4.4800e-003		15.7625	15.7625	5.9000e-004		15.7772

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	12.2870						0.0000	0.0000		0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928

Total	12.5291	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
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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	0.0105	7.6700e-003	0.0718	1.6000e-004	0.0164	1.3000e-004	0.0166	4.3600e-003	1.2000e-004	4.4800e-003		15.7625	15.7625	5.9000e-004		15.7772
Total	0.0105	7.6700e-003	0.0718	1.6000e-004	0.0164	1.3000e-004	0.0166	4.3600e-003	1.2000e-004	4.4800e-003		15.7625	15.7625	5.9000e-004		15.7772

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

	ROG	NOx	CO	SO2	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	0.6381	3.1947	7.4111	0.0189	1.5178	0.0259	1.5436	0.4070	0.0244	0.4314		1,905.1357	1,905.1357	0.0934		1,907.4713
Unmitigated	0.6447	3.2511	7.5550	0.0194	1.5620	0.0265	1.5885	0.4188	0.0250	0.4438		1,957.1828	1,957.1828	0.0953		1,959.5640

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	304.64	317.12	275.84	698,214	678,471
Total	304.64	317.12	275.84	698,214	678,471

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
NaturalGas Mitigated	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
NaturalGas Unmitigated	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665

5.2 Energy by Land Use - Natural Gas

Unmitigated

	Natural Gas 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					
Single Family Housing	2548.17	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
Total		0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665

Mitigated

	Natural Gas 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					
Single Family Housing	2.54817	0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665
Total		0.0275	0.2348	0.0999	1.5000e-003		0.0190	0.0190		0.0190	0.0190		299.7850	299.7850	5.7500e-003	5.5000e-003	301.5665

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	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935
Unmitigated	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935

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	0.2222					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2326					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	33.1622	0.6385	42.8892	0.0808		6.0648	6.0648		6.0648	6.0648	652.1068	197.6471	849.7539	0.8063	0.0460	883.6239
Landscaping	0.0807	0.0306	2.6488	1.4000e-004		0.0146	0.0146		0.0146	0.0146		4.7537	4.7537	4.6400e-003		4.8696
Total	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935

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	0.2222					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2326					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	33.1622	0.6385	42.8892	0.0808		6.0648	6.0648		6.0648	6.0648	652.1068	197.6471	849.7539	0.8063	0.0460	883.6239
Landscaping	0.0807	0.0306	2.6488	1.4000e-004		0.0146	0.0146		0.0146	0.0146		4.7537	4.7537	4.6400e-003		4.8696
Total	34.6976	0.6692	45.5381	0.0809		6.0793	6.0793		6.0793	6.0793	652.1068	202.4007	854.5076	0.8109	0.0460	888.4935

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
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

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

Equipment Type	Number
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11.0 Vegetation

MockingbirdConstPM10.out

AERSCREEN 16216 / AERMOD 18081

11/19/18
09:46:27

TITLE: Mockingbird Construction

***** VOLUME PARAMETERS *****

SOURCE EMISSION RATE:	0.350E-02 g/s	0.278E-01 lb/hr
VOLUME HEIGHT:	5.00 meters	16.40 feet
INITIAL LATERAL DIMENSION:	110.00 meters	360.89 feet
INITIAL VERTICAL DIMENSION:	1.00 meters	3.28 feet
RURAL OR URBAN:	URBAN	
POPULATION:	504217	
INITIAL PROBE DISTANCE =	5000. meters	16404. feet

***** BUILDING DOWNWASH PARAMETERS *****

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

***** PROBE ANALYSIS *****

25 meter receptor spacing: 238. meters - 5000. meters

Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	0.1547	237.5	ANN

* = worst case flow sector

***** MAKEMET METEOROLOGY PARAMETERS *****

MIN/MAX TEMPERATURE: 275.0 / 305.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

MockingbirdConstPM10.out

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: USER ENTERED

ALBEDO: 0.21
BOWEN RATIO: 1.63
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) NOT ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR

10 01 10 10 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF	WS
-1.29	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.63	0.21	0.50		

HT	REF	TA	HT
10.0	305.0		2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR

10 01 10 10 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF	WS
-1.29	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.63	0.21	0.50		

HT	REF	TA	HT
10.0	305.0		2.0

***** AERSCREEN AUTOMATED DISTANCES *****
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

MockingbirdConstPM10.out

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
237.50	0.1547	2625.00	0.5696E-02
250.00	0.1419	2650.00	0.5664E-02
275.00	0.1208	2675.00	0.5632E-02
300.00	0.1044	2700.00	0.5600E-02
325.00	0.9313E-01	2725.00	0.5569E-02
350.00	0.8418E-01	2750.00	0.5539E-02
375.00	0.7645E-01	2775.00	0.5509E-02
400.00	0.6972E-01	2800.00	0.5479E-02
425.00	0.6382E-01	2825.00	0.5449E-02
450.00	0.5861E-01	2850.00	0.5420E-02
475.00	0.5400E-01	2875.00	0.5392E-02
500.00	0.4988E-01	2900.00	0.5363E-02
525.00	0.4619E-01	2925.00	0.5335E-02
550.00	0.4287E-01	2950.00	0.5305E-02
575.00	0.3987E-01	2975.00	0.5275E-02
600.00	0.3740E-01	3000.00	0.5244E-02
625.00	0.3517E-01	3025.00	0.5214E-02
650.00	0.3316E-01	3050.00	0.5185E-02
675.00	0.3133E-01	3075.00	0.5156E-02
700.00	0.2966E-01	3100.00	0.5127E-02
725.00	0.2813E-01	3125.00	0.5098E-02
750.00	0.2673E-01	3150.00	0.5070E-02
775.00	0.2544E-01	3175.00	0.5042E-02
800.00	0.2425E-01	3200.00	0.5015E-02
825.00	0.2315E-01	3225.00	0.4988E-02
850.00	0.2213E-01	3250.00	0.4961E-02
875.00	0.2118E-01	3275.00	0.4935E-02
900.00	0.2030E-01	3300.00	0.4909E-02
925.00	0.1947E-01	3325.00	0.4883E-02
950.00	0.1870E-01	3350.00	0.4858E-02
975.00	0.1798E-01	3375.00	0.4833E-02
1000.00	0.1730E-01	3400.00	0.4808E-02
1025.00	0.1667E-01	3425.00	0.4783E-02
1050.00	0.1607E-01	3450.00	0.4759E-02
1075.00	0.1550E-01	3475.00	0.4735E-02
1100.00	0.1497E-01	3500.00	0.4711E-02
1125.00	0.1447E-01	3525.00	0.4688E-02
1150.00	0.1400E-01	3550.00	0.4665E-02
1175.00	0.1355E-01	3575.00	0.4642E-02
1200.00	0.1312E-01	3600.00	0.4619E-02
1225.00	0.1272E-01	3625.00	0.4597E-02

MockingbirdConstPM10.out

1250.00	0.1234E-01	3650.00	0.4575E-02
1275.00	0.1198E-01	3675.00	0.4553E-02
1300.00	0.1164E-01	3700.00	0.4531E-02
1325.00	0.1131E-01	3725.00	0.4510E-02
1350.00	0.1100E-01	3750.00	0.4488E-02
1375.00	0.1070E-01	3775.00	0.4467E-02
1400.00	0.1042E-01	3800.00	0.4447E-02
1425.00	0.1016E-01	3825.00	0.4426E-02
1450.00	0.9900E-02	3850.00	0.4406E-02
1475.00	0.9657E-02	3875.00	0.4386E-02
1500.00	0.9425E-02	3900.00	0.4366E-02
1525.00	0.9203E-02	3925.00	0.4346E-02
1550.00	0.8991E-02	3950.00	0.4327E-02
1575.00	0.8789E-02	3975.00	0.4307E-02
1600.00	0.8596E-02	4000.00	0.4288E-02
1625.00	0.8411E-02	4025.00	0.4269E-02
1650.00	0.8234E-02	4050.00	0.4251E-02
1675.00	0.8065E-02	4075.00	0.4232E-02
1700.00	0.7903E-02	4100.00	0.4214E-02
1725.00	0.7748E-02	4125.00	0.4196E-02
1750.00	0.7599E-02	4150.00	0.4178E-02
1775.00	0.7456E-02	4175.00	0.4160E-02
1800.00	0.7320E-02	4200.00	0.4142E-02
1825.00	0.7189E-02	4225.00	0.4125E-02
1850.00	0.7063E-02	4250.00	0.4107E-02
1875.00	0.6942E-02	4275.00	0.4090E-02
1900.00	0.6848E-02	4300.00	0.4073E-02
1925.00	0.6800E-02	4325.00	0.4056E-02
1950.00	0.6752E-02	4350.00	0.4040E-02
1975.00	0.6705E-02	4375.00	0.4023E-02
2000.00	0.6659E-02	4400.00	0.4007E-02
2025.00	0.6614E-02	4425.00	0.3991E-02
2050.00	0.6569E-02	4450.00	0.3975E-02
2075.00	0.6525E-02	4475.00	0.3959E-02
2100.00	0.6481E-02	4500.00	0.3943E-02
2125.00	0.6438E-02	4525.00	0.3927E-02
2150.00	0.6396E-02	4550.00	0.3912E-02
2175.00	0.6354E-02	4575.00	0.3897E-02
2200.00	0.6313E-02	4600.00	0.3881E-02
2225.00	0.6273E-02	4625.00	0.3866E-02
2250.00	0.6233E-02	4650.00	0.3851E-02
2275.00	0.6193E-02	4675.00	0.3837E-02
2300.00	0.6155E-02	4700.00	0.3822E-02
2325.00	0.6116E-02	4725.00	0.3807E-02
2350.00	0.6079E-02	4750.00	0.3793E-02
2375.00	0.6041E-02	4775.00	0.3779E-02
2400.00	0.6005E-02	4800.00	0.3764E-02
2425.00	0.5969E-02	4825.00	0.3750E-02

MockingbirdConstPM10.out

2450.00	0.5933E-02	4850.00	0.3736E-02
2475.00	0.5898E-02	4875.00	0.3723E-02
2500.00	0.5863E-02	4900.00	0.3709E-02
2525.00	0.5829E-02	4925.00	0.3695E-02
2550.00	0.5795E-02	4950.00	0.3682E-02
2575.00	0.5761E-02	4975.00	0.3668E-02
2600.00	0.5728E-02	5000.00	0.3655E-02

 ***** AERSCREEN MAXIMUM IMPACT SUMMARY *****

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	0.1547	0.1547	0.1392	0.9282E-01	0.1547E-01

DISTANCE FROM SOURCE 237.50 meters

IMPACT AT THE AMBIENT BOUNDARY	0.1547	0.1547	0.1392	0.9282E-01	0.1547E-01
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DISTANCE FROM SOURCE 237.50 meters

MockingbirdConstPM25.out

AERSCREEN 16216 / AERMOD 18081

11/19/18
09:53:23

TITLE: MOCKINGBIRD CONSTRUCTION

***** VOLUME PARAMETERS *****

SOURCE EMISSION RATE:	0.568E-02 g/s	0.451E-01 lb/hr
VOLUME HEIGHT:	5.00 meters	16.40 feet
INITIAL LATERAL DIMENSION:	110.00 meters	360.89 feet
INITIAL VERTICAL DIMENSION:	1.00 meters	3.28 feet
RURAL OR URBAN:	URBAN	
POPULATION:	504217	
INITIAL PROBE DISTANCE =	5000. meters	16404. feet

***** BUILDING DOWNWASH PARAMETERS *****

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

***** PROBE ANALYSIS *****

25 meter receptor spacing: 238. meters - 5000. meters

Zo	ROUGHNESS	1-HR CONC	DIST	TEMPORAL
SECTOR	LENGTH	(ug/m3)	(m)	PERIOD
1*	1.000	0.2507	237.5	ANN

* = worst case flow sector

***** MAKEMET METEOROLOGY PARAMETERS *****

MIN/MAX TEMPERATURE: 275.0 / 305.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

MockingbirdConstPM25.out

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: USER ENTERED

ALBEDO: 0.21
BOWEN RATIO: 1.63
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) NOT ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR

10 01 10 10 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF	WS
-1.29	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.63	0.21	0.50		

HT	REF	TA	HT
10.0	305.0		2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR

10 01 10 10 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF	WS
-1.29	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.63	0.21	0.50		

HT	REF	TA	HT
10.0	305.0		2.0

***** AERSCREEN AUTOMATED DISTANCES *****
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

MockingbirdConstPM25.out

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
237.50	0.2507	2625.00	0.9231E-02
250.00	0.2300	2650.00	0.9179E-02
275.00	0.1959	2675.00	0.9127E-02
300.00	0.1692	2700.00	0.9077E-02
325.00	0.1509	2725.00	0.9027E-02
350.00	0.1364	2750.00	0.8977E-02
375.00	0.1239	2775.00	0.8928E-02
400.00	0.1130	2800.00	0.8880E-02
425.00	0.1034	2825.00	0.8832E-02
450.00	0.9500E-01	2850.00	0.8785E-02
475.00	0.8751E-01	2875.00	0.8738E-02
500.00	0.8084E-01	2900.00	0.8692E-02
525.00	0.7486E-01	2925.00	0.8647E-02
550.00	0.6948E-01	2950.00	0.8598E-02
575.00	0.6462E-01	2975.00	0.8549E-02
600.00	0.6061E-01	3000.00	0.8499E-02
625.00	0.5700E-01	3025.00	0.8451E-02
650.00	0.5374E-01	3050.00	0.8403E-02
675.00	0.5077E-01	3075.00	0.8356E-02
700.00	0.4807E-01	3100.00	0.8309E-02
725.00	0.4559E-01	3125.00	0.8263E-02
750.00	0.4332E-01	3150.00	0.8217E-02
775.00	0.4123E-01	3175.00	0.8172E-02
800.00	0.3930E-01	3200.00	0.8128E-02
825.00	0.3752E-01	3225.00	0.8084E-02
850.00	0.3587E-01	3250.00	0.8041E-02
875.00	0.3433E-01	3275.00	0.7998E-02
900.00	0.3290E-01	3300.00	0.7956E-02
925.00	0.3156E-01	3325.00	0.7914E-02
950.00	0.3031E-01	3350.00	0.7873E-02
975.00	0.2914E-01	3375.00	0.7832E-02
1000.00	0.2804E-01	3400.00	0.7792E-02
1025.00	0.2701E-01	3425.00	0.7752E-02
1050.00	0.2604E-01	3450.00	0.7713E-02
1075.00	0.2513E-01	3475.00	0.7674E-02
1100.00	0.2427E-01	3500.00	0.7636E-02
1125.00	0.2345E-01	3525.00	0.7598E-02
1150.00	0.2269E-01	3550.00	0.7560E-02
1175.00	0.2196E-01	3575.00	0.7523E-02
1200.00	0.2127E-01	3600.00	0.7486E-02
1225.00	0.2062E-01	3625.00	0.7450E-02

MockingbirdConstPM25.out

1250.00	0.2000E-01	3650.00	0.7414E-02
1275.00	0.1942E-01	3675.00	0.7379E-02
1300.00	0.1886E-01	3700.00	0.7343E-02
1325.00	0.1833E-01	3725.00	0.7309E-02
1350.00	0.1783E-01	3750.00	0.7274E-02
1375.00	0.1735E-01	3775.00	0.7240E-02
1400.00	0.1689E-01	3800.00	0.7207E-02
1425.00	0.1646E-01	3825.00	0.7173E-02
1450.00	0.1605E-01	3850.00	0.7140E-02
1475.00	0.1565E-01	3875.00	0.7108E-02
1500.00	0.1527E-01	3900.00	0.7076E-02
1525.00	0.1492E-01	3925.00	0.7044E-02
1550.00	0.1457E-01	3950.00	0.7012E-02
1575.00	0.1424E-01	3975.00	0.6981E-02
1600.00	0.1393E-01	4000.00	0.6950E-02
1625.00	0.1363E-01	4025.00	0.6919E-02
1650.00	0.1335E-01	4050.00	0.6889E-02
1675.00	0.1307E-01	4075.00	0.6859E-02
1700.00	0.1281E-01	4100.00	0.6829E-02
1725.00	0.1256E-01	4125.00	0.6800E-02
1750.00	0.1232E-01	4150.00	0.6771E-02
1775.00	0.1208E-01	4175.00	0.6742E-02
1800.00	0.1186E-01	4200.00	0.6713E-02
1825.00	0.1165E-01	4225.00	0.6685E-02
1850.00	0.1145E-01	4250.00	0.6657E-02
1875.00	0.1125E-01	4275.00	0.6629E-02
1900.00	0.1110E-01	4300.00	0.6602E-02
1925.00	0.1102E-01	4325.00	0.6574E-02
1950.00	0.1094E-01	4350.00	0.6547E-02
1975.00	0.1087E-01	4375.00	0.6521E-02
2000.00	0.1079E-01	4400.00	0.6494E-02
2025.00	0.1072E-01	4425.00	0.6468E-02
2050.00	0.1065E-01	4450.00	0.6442E-02
2075.00	0.1057E-01	4475.00	0.6416E-02
2100.00	0.1050E-01	4500.00	0.6390E-02
2125.00	0.1043E-01	4525.00	0.6365E-02
2150.00	0.1037E-01	4550.00	0.6340E-02
2175.00	0.1030E-01	4575.00	0.6315E-02
2200.00	0.1023E-01	4600.00	0.6291E-02
2225.00	0.1017E-01	4625.00	0.6266E-02
2250.00	0.1010E-01	4650.00	0.6242E-02
2275.00	0.1004E-01	4675.00	0.6218E-02
2300.00	0.9975E-02	4700.00	0.6194E-02
2325.00	0.9913E-02	4725.00	0.6171E-02
2350.00	0.9852E-02	4750.00	0.6147E-02
2375.00	0.9791E-02	4775.00	0.6124E-02
2400.00	0.9732E-02	4800.00	0.6101E-02
2425.00	0.9673E-02	4825.00	0.6078E-02

MockingbirdConstPM25.out

2450.00	0.9615E-02	4850.00	0.6056E-02
2475.00	0.9558E-02	4875.00	0.6033E-02
2500.00	0.9502E-02	4900.00	0.6011E-02
2525.00	0.9446E-02	4925.00	0.5989E-02
2550.00	0.9391E-02	4950.00	0.5967E-02
2575.00	0.9337E-02	4975.00	0.5946E-02
2600.00	0.9284E-02	5000.00	0.5924E-02

***** AERSCREEN MAXIMUM IMPACT SUMMARY *****

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	0.2507	0.2507	0.2256	0.1504	0.2507E-01
DISTANCE FROM SOURCE	237.50 meters				
IMPACT AT THE AMBIENT BOUNDARY	0.2507	0.2507	0.2256	0.1504	0.2507E-01
DISTANCE FROM SOURCE	237.50 meters				

Construction Risk Calculations

Annual Avg Concentration: $\mu\text{g}/\text{m}^3$
0.015

Cancer Risk

$\text{DOSE}_{\text{air}} = (\text{C}_{\text{air}} \cdot (\text{BR}/\text{BW}) \cdot \text{A} \cdot \text{EF} \cdot 10^{-6})$	1.21963E-05
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$\text{Risk} = \text{DOSE}_{\text{air}} \cdot \text{CPF} \cdot \text{ASF} \cdot \text{ED}/\text{AT} \cdot \text{FAH}$	2.44361E-06
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Cancer Risk: in one million

Construction Exposure	2.44
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Threshold: 10 in one million

	DOSE _{air}		mg/kg-d	Dose through inhalation
	CPF	1.1	(mg/kg/day) ⁻¹	Cancer Potency Factor for DPM
BR/BW	BR/BW	1090	L/kg bodyweight- day	Daily Breathing rate normalized to body weight (Conservatively uses the 95th percentile for 0<2 years for the 18 month construction period)
	10 ⁻⁶	1.00E-06		Micrograms to milligrams conversions, liters to cubic meters conversion
	C _{air}	0.01547	$\mu\text{g}/\text{m}^3$	Concentration in air ($\mu\text{g}/\text{m}^3$), modeled annual average concentration
	A	1		Inhalation absorption factor
	EF	0.72	days/year	Exposure frequency (days/year)
ED	ED	1.5	years	Exposure duration (years)
	AT	70	years	Averaging time period over which exposure is averaged
ASF	ASF (3rd trimester - 2 years)	10		Age Sensitivity Factor
FAH	FAH (3rd trimester - 2 years)	0.85		Fraction of time spent at home (unitless)

Chronic Noncancer Hazard

C_1 1.55E-02 Concentration (annual average)
 REL_1 5 Reference Exposure Level
Hazard Quotient = C_1/REL_1
 $HQ =$ 0.003
Threshold: 1

Acute NonCancer Hazard

Acute HQ = Maximum Hourly Concentration/Acute REL
Max Hourly 1.55E-01
Acute REL (Acrolein) 2.5
Acute HQ = 0.06
Threshold: 1