Air Quality Assessment

St. Mary's Road Double Roundabouts Project

Town of Moraga

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LIST OF ABBREVIATED TERMS

AQMP	air quality management plan
AB	Assembly Bill
ADT	average daily traffic
BAAQMD	Bay Area Air Quality Management District
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAAQS	California Ambient Air Quality Standards
CCAA	California Clean Air Act
CalEEMod	California Emissions Estimator Model
CEQA	California Environmental Quality Act
CO	carbon monoxide
cy	cubic yards
DPM	diesel particulate matter
EPA	Environmental Protection Agency
FCAA	Federal Clean Air Act
H_2S	hydrogen sulfide
Pb	Lead
$\mu g/m^3$	micrograms per cubic meter
mg/m^3	milligrams per cubic meter
NAAQS	National Ambient Air Quality Standards
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
O_3	Ozone
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
ROG	reactive organic gases
SB	Senate Bill
SRA	source receptor area
SCAQMD	South Coast Air Quality Management District
SF	square foot
SO_4^{-2}	Sulfates
SO_2	sulfur dioxide
TAC	toxic air contaminant
C_2H_3Cl	vinyl chloride
VOC	volatile organic compound

1 INTRODUCTION

This report documents the results of an Air Quality Assessment completed for the St. Mary's Road Double Roundabouts Project. The purpose of this Air Quality Assessment is to evaluate the Project's potential construction and operational emissions and determine the Project's level of impact on the environment.

1.1 PROJECT LOCATION

St. Mary's Road is a major north-south arterial that connects the Town of Moraga to the City of Lafayette in California. Figure 1: Regional Vicinity and Figure 2: Site Vicinity, depict the Project site in a regional and local context. St. Mary's Road is located just north of St. Mary's College campus and passes through grass-covered hills, intermixed with forested areas and riparian corridors. Trails and open space surround the project area, including the Lafayette/Moraga Regional Trail. The Lafayette/Moraga Regional Trail runs alongside St. Mary's Road, just to the north of it with riparian corridors between the trail and St. Mary's Road.

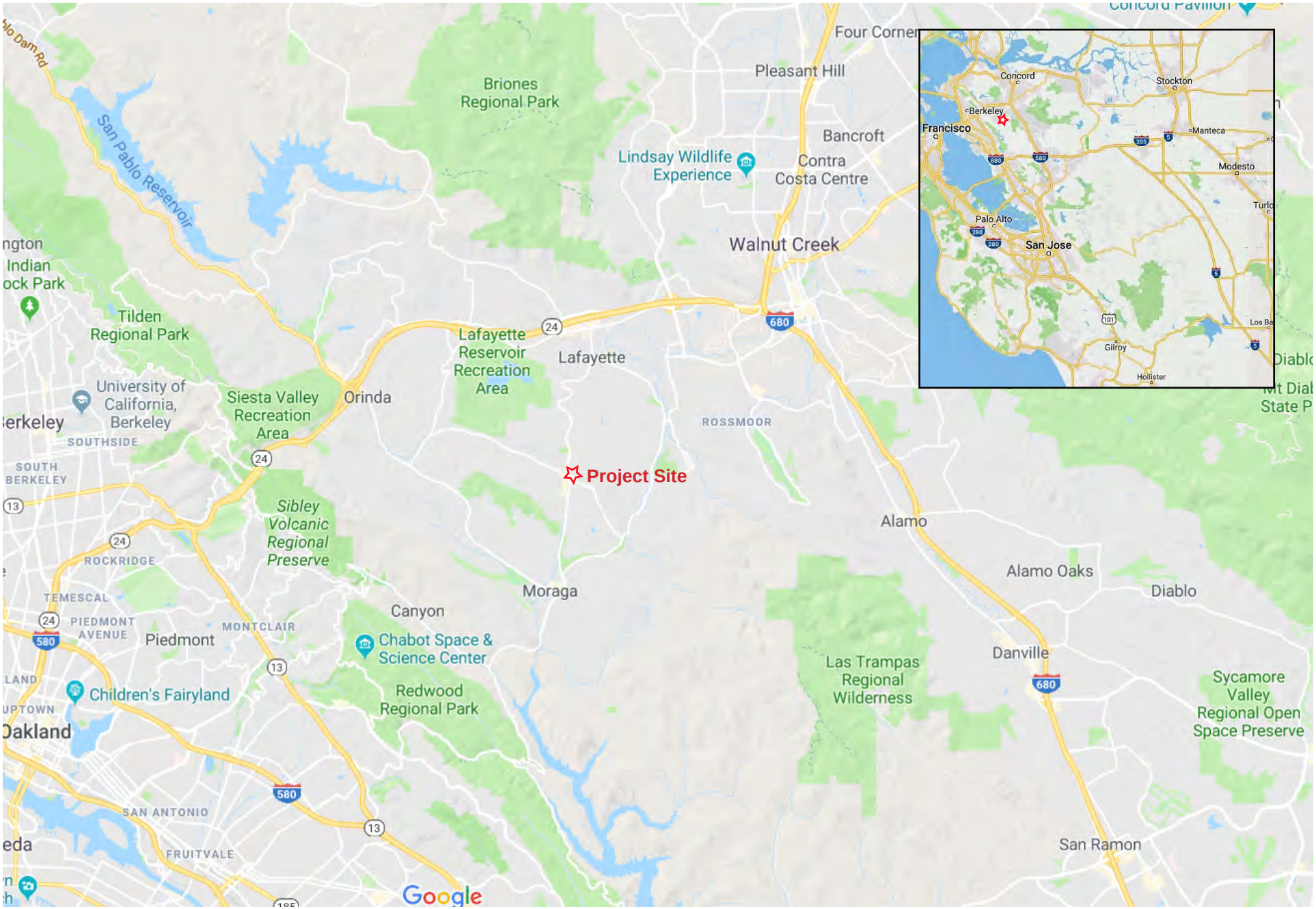
St. Mary's Road, through the project area, is currently a two-lane divided road with an unsignalized intersection at St. Mary's Road and Rheem Boulevard. St. Mary's Road, through the project area, splits off into Bollinger Canyon Road to the south, and continues onto St. Mary's Road to the north. Existing residential development is located to the east and west of the project area. North of St. Mary's Road is an open space area and south is a Pat Vincent Memorial Field and St. Mary's College.

1.2 PROJECT DESCRIPTION

The site plan for the Project is depicted on Figure 3: Site Plan. As proposed, the Project would provide improvements to the two intersections of St. Mary's Road / Rheem Boulevard and St. Mary's Road / Bollinger Canyon Road. The St. Mary's Double Roundabouts Project would improve traffic operations and pedestrian and bicycle access and safety. The Project would construct two roundabouts on St. Mary's Road at the Rheem Boulevard and Bollinger Canyon Road intersections, install green infrastructure, and create safer pedestrian and bicycle crossings. The purpose of the proposed Project is to provide congestion relief at the St. Mary's Road and Rheem Boulevard and to improve stopping sight distance and visibility at the Rheem Boulevard and Bollinger Canyon Road intersections. The Project is proposed to alleviate the current congestion, reduce intersection delays and queues, improve multimodal safety and to better accommodate pedestrian and bicycle traffic.

The travel lanes would be 12 feet wide. The proposed roundabout on St. Mary's Road/Rheem Boulevard would be 120 feet in diameter while the St. Mary's Road/Bollinger Canyon roundabout would be approximately 80 feet in diameter. Both roundabouts would have single-lane entries on all intersection approaches.

Construction is anticipated to begin in Summer 2021 and last approximately 12 months. St. Mary's Road would remain open during construction; however, there may be temporary lane closures on St. Mary's Road, Rheem Boulevard, and Bollinger Canyon Road during non-commute times, and there may be one-way traffic control at night during stage construction switchovers. Construction methods would include excavator trenching, pipe, valve and fitting installation, backfill and compaction of native fill.



Source: Google Maps, 2019

Figure 1: Regional Vicinity

St Mary's Double Roundabouts Project

Not to scale

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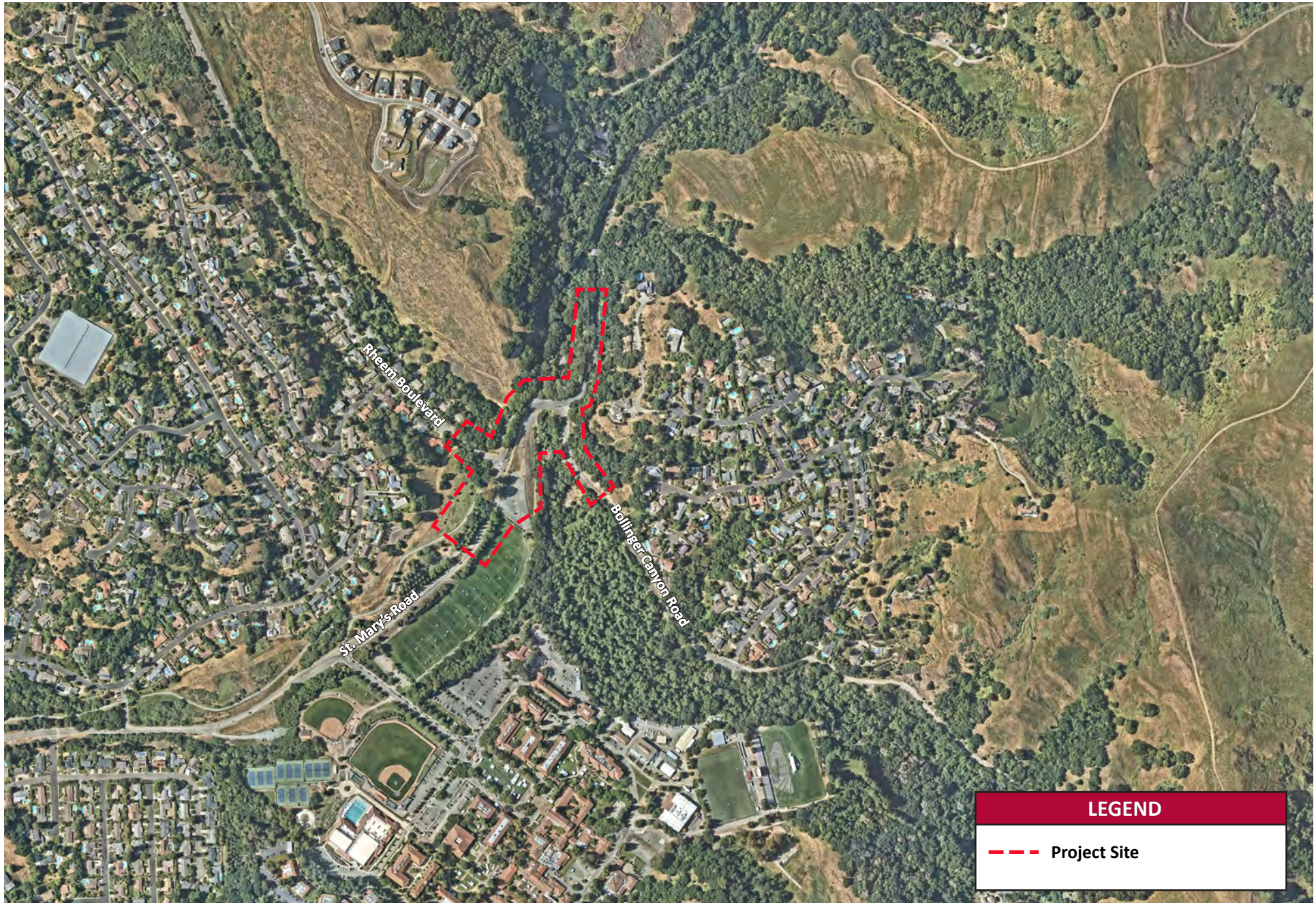
Expect More. Experience Better.



Source: NearMap, 2019

Figure 2: Site Vicinity

St Mary's Double Roundabouts Project

Not to scale

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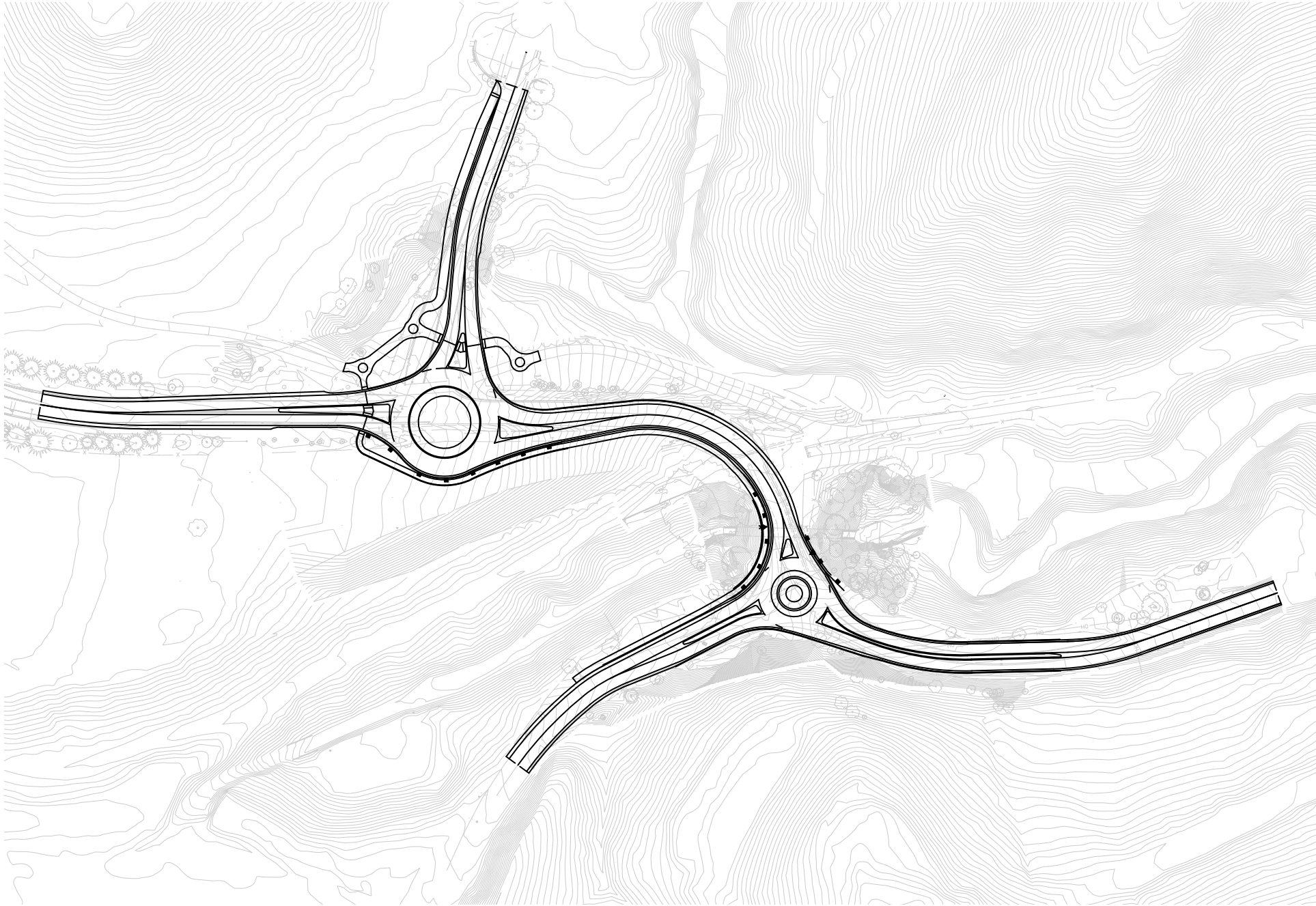

Source: Kimley-Horn, 2019

Figure 3: Site Plan

St Mary's Double Roundabouts Project

Not to scale

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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. These factors along with applicable regulations are discussed below. The Bay Area Air Quality Management District (BAAQMD) is responsible for local control and monitoring of criteria air pollutants throughout the Basin.

Climate, or the average weather condition, affects air quality in several ways. Wind patterns can remove or add air pollutants emitted by stationary or mobile sources. Inversion, a condition where warm air traps cooler air underneath it, can hold pollutants near the ground by limiting upward mixing (dilution). Topography also affects the local climate, as valleys often trap emissions by limiting lateral dispersal.

The inversions typical of winter, called radiation inversions, are formed as heat quickly radiates from the earth's surface after sunset, causing the air in contact with it to rapidly cool. Radiation inversions are strongest on clear, low-wind, cold winter nights, allowing the build-up of such pollutants as carbon monoxide and particulate matter. When wind speeds are low, there is little mechanical turbulence to mix the air, resulting in a layer of warm air over a layer of cooler air next to the ground. During radiation inversions downwind transport is slow, the mixing depths are shallow, and turbulence is minimal, all factors which contribute to ozone formation.

The frequency of hot, sunny days during the summer months in the Basin is another important factor that affects air pollution potential. It is at the higher temperatures that ozone is formed. In the presence of ultraviolet sunlight and warm temperatures, reactive organic gases and oxides of nitrogen react to form secondary photochemical pollutants, including ozone.

The climate is dominated by the location and strength of a semi-permanent, subtropical high-pressure cell. In the summer, the Pacific 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 the surface because of the northwesterly flow produces a band of cold water off the coast which results in condensation and the presence of fog and stratus clouds along the coast. In the winter, the high-pressure cell weakens and shifts southward, resulting in increased wind flow offshore, the absence of upwelling, and the occurrence of storms.

The Basin is characterized by moderately wet winters (November through March) and dry summers. The rainfall in the mountains reaches 40 inches while the valley sees less than 16 inches. Generally, coastal temperatures can be 35 degrees Fahrenheit cooler than temperatures 15 to 20 miles inland. At night, this contrast usually decreases to less than 10 degrees Fahrenheit. In the winter, the relationship of minimum and maximum temperatures is reversed.

The Project Site is located in the Town of Moraga, in Contra Costa County; on the eastern perimeter of the San Francisco Bay. The Town of Moraga is located in the southwest edge of the Diablo Valley. The

Oakland Hills to the west of the Town partially block the flow of air from the west giving the area a warmer, less cloudy climate in the summer and cooler temperatures in the winter. The regulatory section below discusses the various buffer zones around sources of air pollution sufficient to avoid adverse health and nuisance impacts on nearby receptors.

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 (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead are primary air pollutants. Of these, CO, NO_X, SO_2, PM_{10}, 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 (O_3) is formed by a chemical reaction between ROG and NO_X in the presence of sunlight. O_3 and nitrogen dioxide (NO_2) 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 nitrogen 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,	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone. Contributes to global warming and nutrient overloading which

Table 1: Air Contaminants and Associated Public Health Concerns

Pollutant	Major Man-Made Sources	Human Health Effects
	electric utilities, and other sources that burn fuel.	deteriorates water quality. Causes brown discoloration of the atmosphere.
Lead (Pb)	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 (CAPCOA), *Health Effects*, capcoa.org/health-effects/, accessed June 13, 2019.

Ozone, or smog, is not emitted directly into the environment, but is formed in the atmosphere by complex chemical reactions between ROG and NO_X in the presence of sunlight. Ozone formation is greatest on warm, windless, sunny days. The main sources of NO_X and ROG, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) the evaporation of solvents, paints, and fuels, and biogenic sources. Automobiles are the single largest source of ozone precursors in the Basin. Tailpipe emissions of ROG are highest during cold starts, hard acceleration, stop-and-go conditions, and slow speeds. They decline as speeds increase up to about 50 miles per hour (mph), then increase again at high speeds and high engine loads. ROG emissions associated with evaporation of unburned fuel depend on vehicle and ambient temperature cycles. Nitrogen oxide emissions exhibit a different curve; emissions decrease as the vehicle approaches 30 mph and then begin to increase with increasing speeds.

Ozone levels usually build up during the day and peak in the afternoon hours. Short-term exposure can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, it can aggravate existing respiratory diseases such as asthma, bronchitis and emphysema. Chronic exposure to high ozone levels can permanently damage lung tissue. Ozone can also damage plants and trees, and materials such as rubber and fabrics.

Toxic Air Contaminants

Toxic air contaminants (TACs) are airborne substances that can cause short-term (acute) or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes more than 200 compounds, including particulate emissions from diesel-fueled engines.

CARB identified diesel particulate matter (DPM) as a toxic air contaminant. DPM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. Diesel exhaust is a complex mixture of particles and gases produced when an engine burns diesel fuel. DPM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of DPM vary between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine. Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-headedness, and nausea. DPM poses the greatest health risk among the TACs. Almost all diesel exhaust particle mass is 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

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. Existing levels of ambient air quality, historical trends, and projections near the Project site are documented by measurements made by the Bay Area Air Quality Management District (BAAAQMD)'s air pollution regulatory agency that maintains air quality monitoring stations, which process ambient air quality measurements.

Ozone (O_3) and particulate matter (PM_{10} and $PM_{2.5}$) are pollutants of concern in the BAAQMD. The closest air monitoring station to the proposed Project site that monitors ambient concentrations of these pollutants is the Concord Monitoring Station (located approximately 7.6 miles northeast of the Project site) and the San Ramon Monitoring Station (located approximately 12 miles southeast of the Project site). Local air quality data from 2016 to 2018 is provided in Table 2: Ambient Air Quality Data. Table 2 lists the monitored maximum concentrations and number of exceedances of federal or state air quality standards for each year.

Table 2: Ambient Air Quality Data

Pollutant	Concord Monitoring Station[1]			San Ramon Monitoring Station[2]		
	2016	2017	2018	2016	2017	2018
Ozone (O_3)						
1-hour Maximum Concentration (ppm)	0.095	0.082	0.077	--	--	--
8-hour Maximum Concentration (ppm)	0.074	0.070	0.061	0.083	0.075	0.076
Number of Days Standard Exceeded						
CAAQS 1-hour (>0.09 ppm)	1	0	0	--	--	--
NAAQS 8-hour (>0.070 ppm)	2	0	0	1	2	2
Carbon Monoxide (CO)						
1-hour Maximum Concentration (ppm)	1.23	1.68	1.85	--	--	--
Number of Days Standard Exceeded						
NAAQS 1-hour (>35 ppm)	0	0	0	--	--	--
CAAQS 1 hour (>20 ppm)	0	0	0	--	--	--
Nitrogen Dioxide (NO_2)						
1-hour Maximum Concentration (ppm)	33.6	40.6	38.3	26.9	30.6	45.0
Number of Days Standard Exceeded						
NAAQS 1-hour (>100 ppm)	0	0	0	0	0	0

Table 2: Ambient Air Quality Data						
Pollutant	**Concord Monitoring Station[1]**			**San Ramon Monitoring Station[2]**		
	2016	**2017**	**2018**	**2016**	**2017**	**2018**
CAAQS 1-hour (>0.18 ppm)	0	0	0	0	0	0
Particulate Matter Less Than 2.5 Microns ($PM_{2.5}$)						
National 24-hour Maximum Concentration	20.7	89.4	18.0	--	--	--
State 24-hour Maximum Concentration	20.7	89.4	159.2	--	--	--
Number of Days Standard Exceeded						
NAAQS 24-hour (>150 µg/m^3)	0	6	14	--	--	--
CAAQS 24-hour (>50 µg/m^3)	7	12	12	--	--	--
Particulate Matter Less Than 10 Microns (PM_{10})						
National 24-hour Maximum Concentration	18.7	41.2	99.3	--	--	--
State 24-hour Maximum Concentration	19.0	41.0	105.0	--	--	--
Number of Days Standard Exceeded						
NAAQS 24-hour (>150 µg/m^3)	0	0	0	--	--	--
CAAQS 24-hour (>50 µg/m^3)	0	0	1	--	--	--

Notes: 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

[1] Measurements taken at the Concord Monitoring Station located at 2975 Treat Boulevard, Concord, California 94518 (CARB# 07448).

[2] Measurements taken at the Long Beach Monitoring Station located at 9885 Alxoar Blvd. San Ramon, California 94583 (CARB# 60341).

Source: All pollutant measurements are from the CARB Aerometric Data Analysis and Management system database (arb.ca.gov/adam).

2.3 SENSITIVE RECEPTORS

Sensitive populations are more susceptible to the effects of air pollution than the general population. Sensitive receptors 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.

The Project site is a roadway project in the Town of Moraga. The surrounding land uses are predominantly residential north and south of the Project site. Table 3: Sensitive Receptors, lists the distances and locations of nearby sensitive receptors, which primarily include single- family residences, religious institutions, educational institutions, and recreational facilities.

Table 3: Sensitive Receptors	
Receptor Description	**Distance and Direction from the Project Site**
Single-family residential	80 feet north
Single-family residential	100 feet south
Single-family residential	710 feet east
Burton Valley Elementary School	1.12 miles northeast
Donald L. Rheem Elementary School	1.3 miles northwest
Moraga Valley Presbyterian Church	1.5 miles west
Pat Vincent Memorial Field Park	100 feet southwest
Saint Mary's College of California	800 feet southwest

3 REGULATORY SETTING

3.1 FEDERAL

Federal Clean Air Act

Air quality is federally protected by the Federal Clean Air Act (FCAA) and its amendments. Under the FCAA, the EPA developed the primary and secondary National Ambient Air Quality Standards (NAAQS) for the criteria air pollutants including ozone, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and lead. Depending on whether the standards are met or exceeded, the local air basin is classified as in "attainment" or "nonattainment." Some areas are unclassified, which means no monitoring data are available. Unclassified areas are considered to be in attainment. Proposed projects in or near nonattainment areas could be subject to more stringent air-permitting requirements. The FCAA requires that each state prepare a State Implementation Plan (SIP) to demonstrate how it will attain the NAAQS within the federally imposed deadlines.

The U.S. Environmental Protection Agency (EPA) can withhold certain transportation funds from states that fail to comply with the FCAA's planning requirements. 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 Code of Federal Regulations 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. Applicable federal standards are summarized in Table 4: State and Federal Ambient Air Quality Standards.

3.2 STATE OF CALIFORNIA

California Air Resources Board

CARB administers California's air quality policy. The California Ambient Air Quality Standards (CAAQS) were established in 1969 pursuant to the Mulford-Carrell Act. These standards, included with the NAAQS in

Table 4: State and Federal Ambient Air Quality Standards

, 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 applicable State standards are summarized in

Table 4: State and Federal Ambient Air Quality Standards

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Table 4: State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standards[1]	Federal Standards[2]
Ozone (O_3) [2, 5, 7]	8 Hour	0.070 ppm (137 µg/m^3)	0.070 ppm
	1 Hour	0.09 ppm (180 µg/m^3)	NA
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m^3)	0.10 ppm[11]
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)
Sulfur Dioxide (SO_2) [8]	24 Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)
	1 Hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)
	Annual Arithmetic Mean	NA	0.03 ppm (80 µg/m^3)
Particulate Matter (PM_{10}) [1, 3, 6]	24-Hour	50 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	NA
Fine Particulate Matter ($PM_{2.5}$) [3, 4, 6, 9]	24-Hour	NA	35 µg/m^3
	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3
Sulfates (SO_{4-2})	24 Hour	25 µg/m^3	NA
Lead (Pb) [10, 11]	30-Day Average	1.5 µg/m^3	NA
	Calendar Quarter	NA	1.5 µg/m^3
	Rolling 3-Month Average	NA	0.15 µg/m^3
Hydrogen Sulfide (H_2S)	1 Hour	0.03 ppm (0.15 µg/m^3)	NA
Vinyl Chloride (C_2H_3Cl) [10]	24 Hour	0.01 ppm (26 µg/m^3)	NA

Notes:

ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; – = no information available.

[1] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM_{10}, 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 PM_{10} annual standard), then some measurements may be excluded. Measurements are excluded that CARB determines would occur less than once per year on the average. The Lake Tahoe carbon monoxide standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.

[2] 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 or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m$_3$. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m^3.

[3] 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 PM_{10} 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.
NAAQS are set by the EPA at levels determined to be protective of public health with an adequate margin of safety.

[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. No attainment 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 the EPA on June 15, 2005.

[6] In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}.

[7] The 8-hour California ozone standard was approved by the CARB on April 28, 2005 and became effective on May 17, 2006.

[8] On June 2, 2010, the EPA established a new 1-hour SO_2 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 SO_2 NAAQS however must continue to be used until one year following EPA initial designations of the new 1-hour SO_2 NAAQS.

[9] In December 2012, EPA strengthened the annual $PM_{2.5}$ NAAQS from 15.0 to 12.0 µg/m^3. In December 2014, the 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.

[10] 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.

[11] National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.

Source: California Air Resources Board, *Ambient Air Quality Standards*, May 6, 2016.

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.

BAAQMD periodically develops air quality plans that outline the regional strategy to improve air quality and protect the climate. The most recent plan, 2017 Bay Area Clean Air Plan, includes a wide range of control measures designed to reduce emissions of air pollutants and GHGs, including the following examples that may be relevant to this project: reduce emissions of toxic air contaminants by adopting more stringent limits and methods for evaluating toxic risks; implement pricing measures to reduce travel demand; accelerate the widespread adoption of electric vehicles; promote the use of clean fuels; promote energy efficiency in both new and existing buildings; and promote the switch from natural gas to electricity for space and water heating in Bay Area buildings.

Air Quality Management Plan

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 PM_{10} standard). The BAAQMD is responsible for developing a Clean Air Plan, which guides the region's air quality planning efforts to attain the CAAQS. The BAAQMD adopted the 2017 Clean Air Plan: Spare the Air, Cool the Climate 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) 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 contains district-wide control measures to reduce ozone precursor emissions (i.e., ROG and NO_x), particulate matter, TACs, and greenhouse gas emissions. The Bay Area 2017 Clean Air Plan updates the Bay Area 2010 Clean Air Plan in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone; provides a control strategy to reduce ozone, PM, TACs, and greenhouse gases in a single, integrated plan; reviews progress in improving air quality in recent years; and establishes emission control measures to be adopted or implemented in both the short term and through 2050.

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.

The following BAAQMD rules would limit emissions of air pollutants from construction and operation of the Project:

- *Regulation 6, Rule 3. Wood-Burning Devices*. The purpose of this rule is to limit emissions of particulate matter and visible emissions from wood-burning devices used for primary heat, supplemental heat or ambiance.
- *Regulation 8, Rule 3. Architectural Coatings*. This rule governs the manufacture, distribution, and sale of architectural coatings and limits the reactive organic gases content in paints and paint solvents. Although this rule does not directly apply to the project, it does dictate the ROG content of paint available for use during the construction.
- *Regulation 8, Rule 15. Emulsified and Liquid Asphalts*. This rule dictates the reactive organic gases content of asphalt available for use during construction through regulating the sale and use of asphalt and limits the ROG content in asphalt. Although this rule does not directly apply to the project, it does dictate the ROG content of asphalt for use during the construction.
- *Regulation 9, Rule 8. Organic Compounds*. This rule limits the emissions of nitrogen oxides and carbon monoxide from stationary internal combustion engines with an output rated by the manufacturer at more than 50 brake horsepower.

BAAQMD prepared an Ozone Attainment Demonstration Plan to satisfy the federal 1-hour ozone planning requirement because of the Air Basin's nonattainment for federal and State ozone standards. The U.S. EPA revoked the 1-hour ozone standard and adopted an 8-hour ozone standard. The BAAQMD will address the new federal 8-hour ozone planning requirements once they are established.

If approval of a project would not result in significant and unavoidable air quality impacts after the application of all feasible mitigation, the project would be considered consistent with the 2017 Clean Air Plan. In addition, projects are considered consistent with the 2017 Clean Air Plan if they incorporate all applicable and feasible control measures from the 2017 Clean Air Plan and would not disrupt or hinder implementation of any 2017 Clean Air Plan control measures.

3.4 LOCAL

Town of Moraga General Plan

The Town of Moraga 2002 General Plan includes air quality policies and programs that seek to maintain or improve Moraga's air quality. The following relevant General Plan goals and policies address air quality:

Goal: Preservation and Maintenance of air quality.

OS4.1: Development Design. Conserve air quality and minimize direct and indirect emissions of air contaminants through the design and construction of new development. For example, direct emissions may be reduced through energy conserving construction that minimizes space heating, while indirect emissions may be reduced through uses and development patterns that reduce motor vehicle trips generated by the project.

OS4.2: Development Approval and Mitigation. Prohibit development projects which, separately or cumulatively with other projects, would cause air quality standards to be exceeded or would have significant adverse air quality effects through direct and/or indirect emissions. Such projects may only be approved if, after consulting with the BAAQMD, the Town Council explicitly finds that the project incorporates feasible mitigation measures or that there are overriding reasons for approving the project.

OS4.3: Development Setbacks. Provide setbacks along high intensity use roadways to reduce resident exposure to air pollutants.

OS4.4: Landscaping to Reduce Air Quality Impacts. Encourage the use of vegetative buffers along roads to assist in pollutant dispersion.

OS4.5: Alternate Transportation Modes. Encourage transportation modes that minimize motor vehicle use and the resulting contaminant emissions. Alternate modes to be encouraged include public transit, ride-sharing, combined motor vehicle trips to work and the use of bicycles and walking.

OS4.6: New Transportation Technologies. Encourage use of new transportation technologies such as alternative fuel vehicles that may provide environmental benefits such as reduced air pollution, lower energy consumption, and less noise.

OS4.7: Trip Reduction Programs. Encourage employers to foster employer-based transportation control measures such as ride-sharing, use of public transportation, bicycling and walking to work.

OS4.8: Smoking in Public Areas. Discourage smoking in enclosed public places and work areas.

OS4.9: Public Information on Air Pollution. Encourage public education programs that demonstrate the benefits of reduced air pollution.

4 SIGNIFICANCE CRITERIA AND METHODOLOGY

4.1 AIR QUALITY THRESHOLDS

State CEQA Guidelines Appendix G

Based upon the criteria derived from State CEQA Guidelines Appendix G, a project normally would have a significant effect on the environment if it would:

- Conflict with or obstruct implementation of the applicable air quality plan,
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or State ambient air quality standard,
- Expose sensitive receptors to substantial pollutant concentrations, or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Air Quality Threshold

Under the California Environmental Quality Act (CEQA), the Bay Area Air Quality Management District (BAAQMD) is an expert commenting agency on air quality within its jurisdiction or impacting its jurisdiction. Under the Federal Clean Air Act (FCAA), the BAAQMD has adopted Federal attainment plans for O_3 and $PM_{2.5}$. The BAAQMD reviews projects to ensure that they would not: (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay timely attainment of any air quality standard or any required interim emission reductions or other milestones of any Federal attainment plan.

The BAAQMD Options and Justification Report (dated October 2009) establishes thresholds based on substantial evidence, and the thresholds are consistent with the thresholds outlined within the 2010/2011 BAAQMD CEQA Air Quality Guidelines (and current 2017 CEQA Air Quality Guidelines). The thresholds have been developed by the BAAQMD in order to attain State and Federal ambient air quality standards. Therefore, projects below these thresholds would not violate an air quality standard and would not contribute substantially to an existing or projected air quality violation.

The BAAQMD's CEQA Air Quality Guidelines provides significance thresholds for both construction and operation of projects. If the BAAQMD thresholds are exceeded, a potentially significant impact could result. However, ultimately the lead agency determines the thresholds of significance for impacts. If a project proposes development in excess of the established thresholds, as outlined in Table 5: Bay Area Air Quality Management District Emissions Thresholds, a significant air quality impact may occur and additional analysis is warranted to fully assess the significance of impacts.

Table 5: Bay Area Air Quality Management District Emissions Thresholds			
Criteria Air Pollutants and Precursors (Regional)	**Construction-Related**	**Operational-Related**	
	Average Daily Emissions (pounds/day)	**Average Daily Emission (pounds/day)**	**Annual Average Emission (tons/year)**
Reactive Organic Gases (ROG)	54	54	10
Nitrogen Oxides (NO_X)	54	54	10
Coarse Particulates (PM_{10})	82 (exhaust)	82	15
Fine Particulates ($PM_{2.5}$)	54 (exhaust)	54	10
PM_{10} / $PM_{2.5}$ (fugitive dust)	Best Management Practices	None	
Local CO	None	9.0 ppm (8-hour average 20.0 ppm (1-hour average)	
Source: Bay Area Air Quality Management District, 2017 CEQA Air Quality Guidelines, 2017.			

4.2 METHODOLOGY

This air quality impact analysis considers construction and operational impacts associated with the proposed Project. Construction equipment, trucks, worker vehicles, and ground-disturbing activities associated with proposed Project construction would generate emissions of criteria air pollutants and precursors. Air quality impacts were assessed according to CARB and BAAQMD recommended methodologies. Where criteria air pollutant quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with both construction and operations from a variety of land use projects.

5 POTENTIAL IMPACTS AND MITIGATION

5.1 AIR QUALITY ANALYSIS

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

The Project site is an existing roadway and does not include new land uses or structures. The purpose of the proposed Project is to provide congestion relief at the St. Mary's Road and Rheem Boulevard and to improve stopping sight distance and visibility at the Rheem Boulevard and Bollinger Canyon Road intersections. The Project is proposed to alleviate the current congestion, reduce intersection delays and queues, improve multimodal safety and better accommodate pedestrian and bicycle traffic.

The Project is included in the Town of Moraga Capital Improvement Project (CIP). The design concept and scope of the Project is consistent with the project description in the CIP and is intended to meet the traffic needs in the area based on local land use plans. The Project is partially funded through Measure J 2013 Strategic Plan: Major Streets category.

A project would be consistent with the 2017 Clean Air Plan Progress Report if does 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 Town are based on the land use and development projection assumptions in the General Plan. St. Mary's Road and Rheem Boulevard are two of the major arterials in the Town of Moraga providing access to St. Mary's College and connecting to the City of Orinda and Lafayette. The proposed Project is a roadway improvement project that is consistent with the Town of Moraga 2002 General Plan. The Project would improve the physical and operational characteristics of the St. Mary's Road intersections at Rheem Boulevard and Bollinger Canyon Road and realign an existing trail crossing (Lafayette-Moraga Regional Trail) to allow for safe pedestrian and bicycle crossings.

The Project is conforming with Town of Moraga 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 emissions 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 SFBAAB. 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 impact.

Threshold 5.2 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?

Construction Emissions

Project construction activities would generate short-term emissions of criteria air pollutants. The criteria pollutants of primary concern within the project area include ozone-precursor pollutants (i.e., ROG and NO_x) and PM_{10} and $PM_{2.5}$. Construction-generated emissions are short term and temporary, lasting only while construction activities occur, but would be considered a significant air quality impact if the volume of pollutants generated exceeds the BAAQMD's thresholds of significance.

Construction results in the temporary generation of emissions during demolition, site grading, road paving, motor vehicle exhaust associated with construction equipment and worker trips, and the movement of construction equipment, especially on unpaved surfaces. Emissions of airborne particulate matter are largely dependent on the amount of ground disturbance associated with site preparation activities, as well as weather conditions and the appropriate application of water.

The duration of construction activities associated with the proposed Project are estimated to last approximately 12 months. The Project's construction-related emissions were calculated using the BAAQMD-approved CalEEMod computer program, which is designed to model emissions for land use development projects, based on typical construction requirements. Project demolition, site preparation, and grading are anticipated to begin in the Summer 2021. Although the details of Project construction have not been finalized, the conservative modeling assumptions include approximately 1,100 cubic yards of cut material and approximately 1,500 cubic yards of fill. Additionally, approximately 2,370 tons of existing pavement would be demolished. Paving was modeled to be completed by Spring 2022 and painting/striping to be completed Summer 2022. The exact construction timeline is unknown, however to be conservative, earlier dates were utilized in the modeling. This approach is conservative given that emissions factors decrease in future years due to regulatory and technological improvements and fleet turnover. See Appendix A: Air Quality Data for additional information regarding the construction assumptions used in this analysis. The Project's predicted maximum daily construction-related emissions are summarized in Table 6: Construction-Related Emissions (Maximum Pounds Per Day).

Table 6: Construction-Related Emissions (Maximum Pounds Per Day)

Construction Year	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 ($PM_{2.5}$)
2021	2.09	21.63	1.05	0.98	2.88	1.46
2022	1.34	9.36	0.49	0.45	0.12	0.03
Maximum	2.09	21.63	1.05	0.98	2.88	1.46
BAAQMD Threshold	*54*	*54*	*82*	*54*	*N/A*	*N/A*
Exceed BAAQMD Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:
1. Emissions were calculated using CalEEMod.
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 Modeling Data*.

Fugitive Dust Emissions. Fugitive dust emissions are associated with land clearing, ground excavation, cut-and-fill operations, demolition, and truck travel on unpaved roadways. Dust emissions also vary substantially from day to day, depending on the level of activity, the specific operations, and weather conditions. Fugitive dust emissions may have a substantial, temporary impact on local air quality. In addition, fugitive dust may be a nuisance to those living and working in the Project vicinity. Uncontrolled dust from construction can become a nuisance and potential health hazard to those living and working nearby. The BAAQMD recommends the implementation of all Basic Construction Mitigation Measures, whether or not construction-related emissions exceed applicable significance thresholds; refer to MM AQ-1.

Construction Exhaust. Exhaust emission factors for typical diesel-powered heavy equipment are based on the CalEEMod program defaults. Variables factored into estimating the total construction emissions include: level of activity, length of construction period, number of pieces/types of equipment in use, site characteristics, weather conditions, number of construction personnel, and the amount of materials to be transported onsite or offsite. 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 and workers to and from the site. Emitted pollutants would include ROG, NO_X, PM_{10}, and $PM_{2.5}$. The BAAQMD recommends the implementation of all Basic Construction Mitigation Measures, whether or not construction-related emissions exceed applicable significance thresholds; refer to MM AQ-1.

ROG Emissions. In addition to gaseous and particulate emissions, the application of asphalt and surface coatings creates ROG emissions, which are O_3 precursors. In accordance with the methodology prescribed by the BAAQMD, the ROG emissions associated with paving have been quantified with CalEEMod.

The highest concentration of ROG emissions would be generated from pavement off-gassing. The proposed Project does not include any structures and only minimal striping. Although this Project is a roadway improvement project, any paints would be required to comply with BAAQMD Regulation 8, Rule 3: Architectural Coating. Regulation 8, Rule 3 provides specifications on painting practices and regulates the ROG content of paint. Additionally, compliance with BAAQMD Regulation 8, Rule 15: Emulsified Liquid Asphalts, would also be required. This rule dictates the reactive organic gases content of asphalt available for use during construction through regulating the sale and use of asphalt and limits the ROG content in asphalt.

Summary. As shown in Table 6, all criteria pollutant emissions would remain below their respective thresholds. However, BAAQMD considers fugitive dust emissions to be potentially significant without implementation of fugitive dust controls. Accordingly, MM AQ-1 is required to reduce fugitive dust emissions to less than significant. NO_X emissions are primarily generated by engine combustion in construction equipment, haul trucks, and employee commuting, requiring the use of newer construction equipment with better emissions controls would reduce construction-related NO_X emissions.

The proposed Project emissions would not worsen ambient air quality, create additional violations of federal and state standards, or delay the Basin's goal for meeting attainment standards. Impacts would be less than significant.

Operational Emissions

The proposed Project includes two roundabouts and pedestrian and bicycle facilities improvements. The Project would not generate any new automobile, bicycle, or pedestrian traffic and the effects to existing vehicle distribution and travel speeds would be nominal. The Project is proposed to alleviate the current congestion, reduce intersection delays and queues, improve multimodal safety and better accommodate pedestrian and bicycle traffic. The proposed Project does not include any new traffic and no buildings are proposed to be constructed. Therefore, the Project would not generate any new operational emissions. Impacts would be less than significant.

Criteria Pollutant Health Impacts

On December 24, 2018, the California Supreme Court issued an opinion identifying the need to provide sufficient information connecting a project's air emissions to health impacts or explain why such information could not be ascertained (*Sierra Club v. County of Fresno* [Friant Ranch, L.P.] [2018] Cal.5th, Case No. S219783).

As previously discussed, Project construction emissions would be less than significant and would not exceed BAAQMD thresholds (refer to Table 6). The BAAQMD has set its CEQA significance threshold based on the trigger levels for the federal New Source Review (NSR) Program and BAAQMD's Regulation 2, Rule 2 for new or modified sources. The NSR Program[1] was created by the FCAA to ensure that stationary sources of air pollution are constructed or modified in a manner that is consistent with attainment of health-based federal ambient air quality standards. The federal ambient air quality standards establish the levels of air quality necessary, with an adequate margin of safety, to protect the public health. Project operations would also not generate an increase in emissions, and therefore would not exceed the ambient air quality standards or cause an increase in the frequency or severity of existing violations of those standards. Therefore, the proposed Project would not violate any air quality standards or contribute substantially to an existing or projected air quality violation and no criteria pollutant health impacts would occur. Project impacts would be less than significant.

Cumulative Short-Term Emissions

The SFBAAB is designated nonattainment for O_3, PM_{10}, and $PM_{2.5}$ for State standards and nonattainment for O_3 and $PM_{2.5}$ for Federal standards. As discussed above, the Project's construction-related 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 Mitigation Measures for all projects whether or not construction-related emissions exceed the thresholds of significance. Compliance with BAAQMD construction-related mitigation requirements are considered to reduce cumulative impacts at a Basin-wide level. As a result, construction emissions associated with the proposed

[1] Code of Federal Regulation (CFR) [i.e., PSD (40 CFR 52.21, 40 CFR 51.166, 40 CFR 51.165 (b)), Non-attainment NSR (40 CFR 52.24, 40 CFR 51.165, 40 CFR part 51, Appendix S)

Project would not result in a cumulatively considerable contribution to significant cumulative air quality impacts.

Cumulative Long-Term Impacts

The BAAQMD has not established separate significance thresholds for cumulative operational emissions. The nature of air emissions is largely a cumulative impact. As a result, no single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. The BAAQMD developed the operational thresholds of significance based on the level above which a project's individual emissions would result in a cumulatively considerable contribution to the Basin's existing air quality conditions. Therefore, a project that exceeds the BAAQMD operational thresholds would also be a cumulatively considerable contribution to a significant cumulative impact.

As discussed above, the proposed Project would not generate any new automobile, bicycle, or pedestrian traffic. Therefore, operational emissions associated with the proposed Project would not generate new operational emissions and would not result in a cumulatively considerable contribution to significant cumulative air quality impacts.

Mitigation Measures:

AQ-1 **BAAQMD Basic Construction Measures.** Prior to any grading activities, the applicant shall prepare and implement a Construction Management Plan that includes the BAAQMD Basic Construction Mitigation Measures to minimize construction-related emissions. This shall plan shall first be reviewed and approved by the Director of Public Works/City Engineer. The BAAQMD Basic Construction Mitigation Measures are:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Level of Significance: Less than significant impact with mitigation.

Threshold 5.3 Would the Project expose sensitive receptors to substantial pollutant concentrations?

Sensitive land uses 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. Sensitive receptors in the area include single-family residences approximately 80 feet to the north and 100 feet south of the Project Site.

Toxic Air Contaminants

Construction equipment and associated heavy-duty truck traffic generate diesel exhaust, which is a known toxic air contaminants (TAC). Diesel exhaust from construction equipment operating at the site poses a health risk to nearby sensitive receptors. The closest sensitive receptor to the Project site are the residences to the north and south of the Project site. 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) will result in a significant impact. The BAAQMD considers exposure to annual $PM_{2.5}$ concentrations that exceed 0.3 $\mu g/m^3$ from a single source to be significant. The BAAQMD significance threshold for non-cancer hazards is 1.0.

Mobile Sources

The Project does not include sensitive receptors and therefore would not place sensitive receptors within 1,000-feet of a major roadway (mobile TAC sources). Additionally, the Project's effects to existing vehicle distribution and travel speeds would be nominal. Any changes to vehicle distribution and travel speeds can affect vehicle emissions rates, although these changes would be minimal and would not substantially change criteria pollutant emissions, which are primarily driven by VMT. Traffic is also predominantly light-duty and gasoline powered and therefore any shifts in traffic would not constitute a change in substantial cancer risk. The Project would not increase roadway capacity, but would alleviate current congestion, reduce intersection delays and queues, improve multimodal safety, and better accommodate pedestrian and bicycle traffic. As such, the Project would not generate increased emissions for new vehicle traffic and would potentially improve emissions from reduced idling and delay. Therefore, impacts related to cancer risk, hazards, and $PM_{2.5}$ concentrations from mobile sources would be less than significant at the Project site.

Carbon Monoxide Hotspots

The primary mobile-source criteria pollutant of local concern is carbon monoxide (CO). 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 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. Traffic would increase along surrounding roadways during long-term operational activities.

The proposed roundabouts and pedestrian and bicycle facilities improvements would not increase roadway capacity and would not generate an increase in vehicle trips. The Project would alleviate current congestion, reduce intersection delays and queues, improve multimodal safety and better accommodate pedestrian and bicycle traffic. The operational improvements would reduce idling, thereby reducing localized vehicle emissions, including CO. As a result, the Project would not have the potential to create a CO hotspot and impacts would be less than significant.

Construction-Related Diesel Particulate Matter

Construction-related activities would result in Project-generated emissions of diesel particulate matter (DPM) from the exhaust of off-road, heavy-duty diesel equipment for site preparation (e.g., demolition, clearing, grading); paving; application of architectural coatings; on-road truck travel; and other miscellaneous activities. 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 closest sensitive receptor to the Project site are the single-family residences located approximately 80 feet north of the Project site.

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 five minutes, which would further reduce nearby sensitive receptors' exposure to temporary and variable diesel PM emissions.

Furthermore, even during the most intense year of construction, emissions of diesel PM 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 diesel particulate matter (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.[2] Maximum (worst case) PM_{10} 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). PM_{10} emissions are higher than $PM_{2.5}$ Project emissions and were conservatively used in the impact assessment.

Construction emissions rates in grams per second were calculated from the total annual mitigated on-site exhaust emissions reported in CalEEMod for PM_{10} (0.0654 tons per year) to calculate risk levels. Total mitigated on-site exhaust and fugitive dust for $PM_{2.5}$ (0.1381 tons per year) were conservatively used to assess of $PM_{2.5}$ concentrations against the BAAQMD's 0.3 µg/m^3 threshold (it should be noted that this approach is conservative as estimation of only the exhaust emissions are required for comparison to the threshold). 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 0.011 µg/m^3 which is below the BAAQMD 0.3 µg/m^3 significance threshold. The highest calculated carcinogenic risk from Project construction is 1.09 per million based on an annual PM_{10} concentration of 0.0052 µg/m^3. The risk calculation used a construction exposure duration of one years and a weighted breathing rate of 944 liters per kilogram of bodyweight per day (based on OEHHA 95 percentile breathing rates of 3 moths at 361 and 12 months at 1,090 liters per kilogram). Non-cancer hazards for DPM would be below BAAQMD threshold of 1.0, with a chronic hazard index computed at 0.001 and an acute hazard index of 0.0021. 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.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

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

Threshold 5.4 Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Construction

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.

Construction activities associated with the Project may generate detectable odors from heavy duty equipment (i.e., diesel exhaust), 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. Any construction-related odors would be short-term in nature and cease upon Project completion. As a result, impacts to existing adjacent land uses from construction-related odors would be short-term in duration and therefore would be less than significant.

Operational

BAAQMD has established odor screening thresholds for land uses that have the potential to generate substantial odor complaints, including wastewater treatment plants, landfills or transfer stations, composting facilities, confined animal facilities, food manufacturing, and chemical plants. 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.

The proposed Project is a roadway improvement Project which includes two roundabouts. With respect to odor impacts from adjacent and nearby properties that could affect Project residents, land uses typically producing objectionable odors include agricultural uses, wastewater treatment facilities, waste-disposal facilities, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. None of these uses are located near the Project site. Impacts would be less-than-significant.

Mitigation Measures: No mitigation is required.

Level of Significance: No impact.

CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

Cumulative Setting

The cumulative setting for air quality includes the Town of Moraga and the Air Basin. Air Basin is designated as a nonattainment area for state standards of ozone, PM_{10}, and $PM_{2.5}$. The Air Basin is designated as a nonattainment area for federal standards of ozone and $PM_{2.5,}$ attainment and serious maintenance for federal PM_{10} standards, and is designated as unclassified or attainment for all other

pollutants. Cumulative growth in population and vehicle use could inhibit efforts to improve regional air quality and attain the ambient air quality standards.

Cumulative Impacts and Mitigation Measures

The BAAQMD CEQA Air Quality Guidelines do not include separate significance thresholds for cumulative operational emissions. However, with respect to regional air pollution, the development of the Project would not result in population growth and therefore is consistent with the City's General Plan projections. The Project would be consistent with the 2017 Clean Air Plan that uses ABAG population forecasts. Additionally, as noted above, the Project would alleviate current congestion, reduce intersection delays and queues, improve multimodal safety and better accommodate pedestrian and bicycle traffic. The operational improvements would reduce idling, thereby reducing vehicle emissions.

As described in Impact Statement 5.1, above, the Project would also be consistent with the appropriate 2017 Clean Air Plan control measures, which are provided to reduce air quality emissions for the entire Bay Area region. Additionally, the discussion in Impact Statement 5.2 addresses cumulative impacts and demonstrates that the Project would not exceed the applicable BAAQMD thresholds. The BAAQMD CEQA Air Quality Guidelines note that the nature of air emissions is largely a cumulative impact. As a result, no single project is sufficient in size by itself to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. Consistency with the 2017 Clean Air Plan control measures would ensure that the Project would not cumulatively contribute to air quality impacts in the Basin. Therefore, impacts would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

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 (CAPCOA), *Health Effects*, 2018.
7. California Air Pollution Control Officers Association (CAPCOA), *Health Risk Assessments for Proposed Land Use Projects*, 2009.
8. California Air Resources Board, *Aerometric Data Analysis and Measurement System (ADAM) Top Four Summaries from 2015 to 2017*, 2018.
9. California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective*, 2005.
10. California Air Resources Board, *Current Air Quality Standards*, 2016.
11. California Air Resources Board, *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, 2000.
12. Federal Highway Administration*, Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents,* 2016.
13. Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Risk Assessment Guidelines*, 2015.
14. United States Environmental Protection Agency, *National Ambient Air Quality Standards Table*, 2016.
15. United States Environmental Protection Agency, *Nonattainment Areas for Criteria Pollutants*, 2018.
16. United States Environmental Protection Agency, *Policy Assessment for the Review of the Lead National Ambient Air Quality Standards*, 2013.

Appendix A

Air Quality Modeling Data

St. Mary's Roundabout - Contra Costa County, Summer

St. Mary's Roundabout

Contra Costa County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	2.20	Acre	2.20	95,832.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Anticipated construction schedule

Off-road Equipment -

Off-road Equipment - equipment use

Off-road Equipment -

Demolition -

Grading -

Construction Off-road Equipment Mitigation - Per BAAQMD basic control measures

Vehicle Trips -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	6
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	20.00	33.00
tblConstructionPhase	NumDays	3.00	33.00
tblConstructionPhase	NumDays	6.00	80.00
tblConstructionPhase	NumDays	220.00	0.00
tblConstructionPhase	NumDays	10.00	80.00
tblConstructionPhase	NumDays	10.00	36.00
tblConstructionPhase	PhaseEndDate	9/28/2021	7/15/2021
tblConstructionPhase	PhaseEndDate	10/1/2021	8/31/2021
tblConstructionPhase	PhaseEndDate	10/11/2021	12/21/2021
tblConstructionPhase	PhaseEndDate	8/15/2022	10/11/2021
tblConstructionPhase	PhaseEndDate	8/29/2022	4/12/2022
tblConstructionPhase	PhaseEndDate	9/12/2022	6/1/2022
tblConstructionPhase	PhaseStartDate	9/1/2021	6/1/2021
tblConstructionPhase	PhaseStartDate	9/29/2021	7/16/2021
tblConstructionPhase	PhaseStartDate	10/2/2021	9/1/2021
tblConstructionPhase	PhaseStartDate	8/16/2022	12/22/2021
tblConstructionPhase	PhaseStartDate	8/30/2022	4/13/2022
tblGrading	MaterialExported	0.00	1,096.00
tblGrading	MaterialImported	0.00	1,495.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.0911	21.5847	15.1904	0.0312	6.6345	1.0475	7.5508	3.3893	0.9778	4.2322	0.0000	3,082.4908	3,082.4908	0.7963	0.0000	3,102.3974
2022	1.3400	9.3582	12.0519	0.0190	0.1232	0.4886	0.6118	0.0327	0.4507	0.4833	0.0000	1,826.1592	1,826.1592	0.5443	0.0000	1,839.7672
Maximum	**2.0911**	**21.5847**	**15.1904**	**0.0312**	**6.6345**	**1.0475**	**7.5508**	**3.3893**	**0.9778**	**4.2322**	**0.0000**	**3,082.4908**	**3,082.4908**	**0.7963**	**0.0000**	**3,102.3974**

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					
2021	2.0911	21.5847	15.1904	0.0312	2.8790	1.0475	3.7953	1.4603	0.9778	2.3033	0.0000	3,082.4908	3,082.4908	0.7963	0.0000	3,102.3974
2022	1.3400	9.3582	12.0519	0.0190	0.1168	0.4886	0.6054	0.0311	0.4507	0.4818	0.0000	1,826.1592	1,826.1592	0.5443	0.0000	1,839.7672
Maximum	**2.0911**	**21.5847**	**15.1904**	**0.0312**	**2.8790**	**1.0475**	**3.7953**	**1.4603**	**0.9778**	**2.3033**	**0.0000**	**3,082.4908**	**3,082.4908**	**0.7963**	**0.0000**	**3,102.3974**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**55.67**	**0.00**	**46.09**	**56.42**	**0.00**	**40.94**	**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	0.0449	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0449**	**0.0000**	**2.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**0.0000**	**5.1000e-004**

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	0.0449	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0449**	**0.0000**	**2.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**0.0000**	**5.1000e-004**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2021	7/15/2021	5	33	
2	Site Preparation	Site Preparation	7/16/2021	8/31/2021	5	33	
3	Grading	Grading	9/1/2021	12/21/2021	5	80	
4	Building Construction	Building Construction	10/12/2021	10/11/2021	5	0	
5	Paving	Paving	12/22/2021	4/12/2022	5	80	
6	Architectural Coating	Architectural Coating	4/13/2022	6/1/2022	5	36	

Acres of Grading (Site Preparation Phase): 49.5

Acres of Grading (Grading Phase): 40

Acres of Paving: 2.2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 5,750

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	0	8.00	231	0.29

Building Construction	Forklifts	0	7.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	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
Demolition	5	13.00	0.00	234.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	256.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	0	40.00	16.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	8.00	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

Clean Paved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5362	0.0000	1.5362	0.2326	0.0000	0.2326			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715		2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**1.5362**	**1.0409**	**2.5771**	**0.2326**	**0.9715**	**1.2041**		**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

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	0.0545	1.8629	0.3639	5.5400e-003	0.1239	5.9500e-003	0.1298	0.0339	5.7000e-003	0.0396		589.6550	589.6550	0.0250		590.2803
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	0.0437	0.0252	0.3340	1.0500e-003	0.1068	6.7000e-004	0.1075	0.0283	6.2000e-004	0.0289		104.8368	104.8368	2.3800e-003		104.8963
Total	**0.0981**	**1.8881**	**0.6979**	**6.5900e-003**	**0.2307**	**6.6200e-003**	**0.2373**	**0.0623**	**6.3200e-003**	**0.0686**		**694.4918**	**694.4918**	**0.0274**		**695.1766**

Mitigated Construction On-Site

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

Fugitive Dust					0.6567	0.0000	0.6567	0.0994	0.0000	0.0994			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715	0.0000	2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.6567**	**1.0409**	**1.6976**	**0.0994**	**0.9715**	**1.0709**	**0.0000**	**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

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	0.0545	1.8629	0.3639	5.5400e-003	0.1182	5.9500e-003	0.1242	0.0326	5.7000e-003	0.0383		589.6550	589.6550	0.0250		590.2803
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	0.0437	0.0252	0.3340	1.0500e-003	0.1012	6.7000e-004	0.1019	0.0270	6.2000e-004	0.0276		104.8368	104.8368	2.3800e-003		104.8963
Total	**0.0981**	**1.8881**	**0.6979**	**6.5900e-003**	**0.2195**	**6.6200e-003**	**0.2261**	**0.0595**	**6.3200e-003**	**0.0658**		**694.4918**	**694.4918**	**0.0274**		**695.1766**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457		2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**1.5908**	**0.7019**	**2.2926**	**0.1718**	**0.6457**	**0.8175**		**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

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	0.0596	2.0380	0.3981	6.0600e-003	0.1355	6.5100e-003	0.1420	0.0371	6.2300e-003	0.0434		645.0927	645.0927	0.0274		645.7767
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	0.0269	0.0155	0.2055	6.5000e-004	0.0657	4.1000e-004	0.0661	0.0174	3.8000e-004	0.0178		64.5150	64.5150	1.4600e-003		64.5516
Total	**0.0864**	**2.0535**	**0.6037**	**6.7100e-003**	**0.2012**	**6.9200e-003**	**0.2082**	**0.0546**	**6.6100e-003**	**0.0612**		**709.6076**	**709.6076**	**0.0288**		**710.3283**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6801	0.0000	0.6801	0.0734	0.0000	0.0734			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457	0.0000	2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**0.6801**	**0.7019**	**1.3819**	**0.0734**	**0.6457**	**0.7192**	**0.0000**	**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

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	0.0596	2.0380	0.3981	6.0600e-003	0.1294	6.5100e-003	0.1359	0.0356	6.2300e-003	0.0419		645.0927	645.0927	0.0274		645.7767
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	0.0269	0.0155	0.2055	6.5000e-004	0.0623	4.1000e-004	0.0627	0.0166	3.8000e-004	0.0170		64.5150	64.5150	1.4600e-003		64.5516
Total	**0.0864**	**2.0535**	**0.6037**	**6.7100e-003**	**0.1916**	**6.9200e-003**	**0.1986**	**0.0522**	**6.6100e-003**	**0.0588**		**709.6076**	**709.6076**	**0.0288**		**710.3283**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425		1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**6.5523**	**0.9158**	**7.4681**	**3.3675**	**0.8425**	**4.2100**		**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

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	0.0336	0.0194	0.2569	8.1000e-004	0.0822	5.2000e-004	0.0827	0.0218	4.7000e-004	0.0223		80.6437	80.6437	1.8300e-003		80.6894
Total	**0.0336**	**0.0194**	**0.2569**	**8.1000e-004**	**0.0822**	**5.2000e-004**	**0.0827**	**0.0218**	**4.7000e-004**	**0.0223**		**80.6437**	**80.6437**	**1.8300e-003**		**80.6894**

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					2.8011	0.0000	2.8011	1.4396	0.0000	1.4396			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425	0.0000	1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**2.8011**	**0.9158**	**3.7169**	**1.4396**	**0.8425**	**2.2821**	**0.0000**	**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

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	0.0336	0.0194	0.2569	8.1000e-004	0.0779	5.2000e-004	0.0784	0.0207	4.7000e-004	0.0212		80.6437	80.6437	1.8300e-003		80.6894
Total	**0.0336**	**0.0194**	**0.2569**	**8.1000e-004**	**0.0779**	**5.2000e-004**	**0.0784**	**0.0207**	**4.7000e-004**	**0.0212**		**80.6437**	**80.6437**	**1.8300e-003**		**80.6894**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	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	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	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	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0633	10.6478	11.7756	0.0178		0.5826	0.5826		0.5371	0.5371		1,709.1107	1,709.1107	0.5417		1,722.6524

Paving	0.0721					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1354**	**10.6478**	**11.7756**	**0.0178**		**0.5826**	**0.5826**		**0.5371**	**0.5371**		**1,709.1107**	**1,709.1107**	**0.5417**		**1,722.6524**

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	0.0504	0.0291	0.3853	1.2100e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334		120.9656	120.9656	2.7400e-003		121.0342
Total	**0.0504**	**0.0291**	**0.3853**	**1.2100e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**		**120.9656**	**120.9656**	**2.7400e-003**		**121.0342**

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	1.0633	10.6478	11.7756	0.0178		0.5826	0.5826		0.5371	0.5371	0.0000	1,709.1107	1,709.1107	0.5417		1,722.6524
Paving	0.0721					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1354**	**10.6478**	**11.7756**	**0.0178**		**0.5826**	**0.5826**		**0.5371**	**0.5371**	**0.0000**	**1,709.1107**	**1,709.1107**	**0.5417**		**1,722.6524**

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	0.0504	0.0291	0.3853	1.2100e-003	0.1168	7.7000e-004	0.1176	0.0311	7.1000e-004	0.0318		120.9656	120.9656	2.7400e-003		121.0342
Total	**0.0504**	**0.0291**	**0.3853**	**1.2100e-003**	**0.1168**	**7.7000e-004**	**0.1176**	**0.0311**	**7.1000e-004**	**0.0318**		**120.9656**	**120.9656**	**2.7400e-003**		**121.0342**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500		1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	0.0721					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0132**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**		**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

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	0.0468	0.0261	0.3549	1.1700e-003	0.1232	7.5000e-004	0.1240	0.0327	7.0000e-004	0.0334		116.4700	116.4700	2.4600e-003		116.5316
Total	**0.0468**	**0.0261**	**0.3549**	**1.1700e-003**	**0.1232**	**7.5000e-004**	**0.1240**	**0.0327**	**7.0000e-004**	**0.0334**		**116.4700**	**116.4700**	**2.4600e-003**		**116.5316**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500	0.0000	1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	0.0721					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0132**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**	**0.0000**	**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

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	0.0468	0.0261	0.3549	1.1700e-003	0.1168	7.5000e-004	0.1176	0.0311	7.0000e-004	0.0318		116.4700	116.4700	2.4600e-003		116.5316
Total	**0.0468**	**0.0261**	**0.3549**	**1.1700e-003**	**0.1168**	**7.5000e-004**	**0.1176**	**0.0311**	**7.0000e-004**	**0.0318**		**116.4700**	**116.4700**	**2.4600e-003**		**116.5316**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	1.1105					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**1.3150**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	0.0250	0.0139	0.1893	6.2000e-004	0.0657	4.0000e-004	0.0661	0.0174	3.7000e-004	0.0178		62.1173	62.1173	1.3100e-003		62.1502
Total	**0.0250**	**0.0139**	**0.1893**	**6.2000e-004**	**0.0657**	**4.0000e-004**	**0.0661**	**0.0174**	**3.7000e-004**	**0.0178**		**62.1173**	**62.1173**	**1.3100e-003**		**62.1502**

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	1.1105					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**1.3150**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	0.0250	0.0139	0.1893	6.2000e-004	0.0623	4.0000e-004	0.0627	0.0166	3.7000e-004	0.0170		62.1173	62.1173	1.3100e-003		62.1502
Total	**0.0250**	**0.0139**	**0.1893**	**6.2000e-004**	**0.0623**	**4.0000e-004**	**0.0627**	**0.0166**	**3.7000e-004**	**0.0170**		**62.1173**	**62.1173**	**1.3100e-003**		**62.1502**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.586711	0.038259	0.185486	0.120728	0.016377	0.005053	0.010699	0.024311	0.001622	0.001773	0.005406	0.002738	0.000835

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

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

Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.0449	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Unmitigated	0.0449	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004

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	0.0110					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Consumer Products	0.0339					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-005	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Total	**0.0449**	**0.0000**	**2.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**4.8000e-004**	**4.8000e-004**	**0.0000**		**5.1000e-004**

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	0.0110					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0339					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-005	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Total	**0.0449**	**0.0000**	**2.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**4.8000e-004**	**4.8000e-004**	**0.0000**		**5.1000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

St. Mary's Roundabout - Contra Costa County, Winter

St. Mary's Roundabout

Contra Costa County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	2.20	Acre	2.20	95,832.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Anticipated construction schedule

Off-road Equipment -

Off-road Equipment - equipment use

Off-road Equipment -

Demolition -

Grading -

Construction Off-road Equipment Mitigation - Per BAAQMD basic control measures

Vehicle Trips -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	6
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	20.00	33.00
tblConstructionPhase	NumDays	3.00	33.00
tblConstructionPhase	NumDays	6.00	80.00
tblConstructionPhase	NumDays	220.00	0.00
tblConstructionPhase	NumDays	10.00	80.00
tblConstructionPhase	NumDays	10.00	36.00
tblConstructionPhase	PhaseEndDate	9/28/2021	7/15/2021
tblConstructionPhase	PhaseEndDate	10/1/2021	8/31/2021
tblConstructionPhase	PhaseEndDate	10/11/2021	12/21/2021
tblConstructionPhase	PhaseEndDate	8/15/2022	10/11/2021
tblConstructionPhase	PhaseEndDate	8/29/2022	4/12/2022
tblConstructionPhase	PhaseEndDate	9/12/2022	6/1/2022
tblConstructionPhase	PhaseStartDate	9/1/2021	6/1/2021
tblConstructionPhase	PhaseStartDate	9/29/2021	7/16/2021
tblConstructionPhase	PhaseStartDate	10/2/2021	9/1/2021
tblConstructionPhase	PhaseStartDate	8/16/2022	12/22/2021
tblConstructionPhase	PhaseStartDate	8/30/2022	4/13/2022
tblGrading	MaterialExported	0.00	1,096.00
tblGrading	MaterialImported	0.00	1,495.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.0932	21.6320	15.1907	0.0311	6.6345	1.0476	7.5508	3.3893	0.9779	4.2322	0.0000	3,065.3175	3,065.3175	0.7978	0.0000	3,085.2628
2022	1.3404	9.3643	12.0196	0.0189	0.1232	0.4886	0.6118	0.0327	0.4507	0.4833	0.0000	1,815.2189	1,815.2189	0.5441	0.0000	1,828.8215
Maximum	**2.0932**	**21.6320**	**15.1907**	**0.0311**	**6.6345**	**1.0476**	**7.5508**	**3.3893**	**0.9779**	**4.2322**	**0.0000**	**3,065.3175**	**3,065.3175**	**0.7978**	**0.0000**	**3,085.2628**

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					
2021	2.0932	21.6320	15.1907	0.0311	2.8790	1.0476	3.7953	1.4603	0.9779	2.3033	0.0000	3,065.3175	3,065.3175	0.7978	0.0000	3,085.2628
2022	1.3404	9.3643	12.0196	0.0189	0.1168	0.4886	0.6054	0.0311	0.4507	0.4818	0.0000	1,815.2189	1,815.2189	0.5441	0.0000	1,828.8215
Maximum	**2.0932**	**21.6320**	**15.1907**	**0.0311**	**2.8790**	**1.0476**	**3.7953**	**1.4603**	**0.9779**	**2.3033**	**0.0000**	**3,065.3175**	**3,065.3175**	**0.7978**	**0.0000**	**3,085.2628**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**55.67**	**0.00**	**46.09**	**56.42**	**0.00**	**40.94**	**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	0.0449	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0449**	**0.0000**	**2.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**0.0000**	**5.1000e-004**

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	0.0449	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0449**	**0.0000**	**2.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**0.0000**	**5.1000e-004**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2021	7/15/2021	5	33	
2	Site Preparation	Site Preparation	7/16/2021	8/31/2021	5	33	
3	Grading	Grading	9/1/2021	12/21/2021	5	80	
4	Building Construction	Building Construction	10/12/2021	10/11/2021	5	0	
5	Paving	Paving	12/22/2021	4/12/2022	5	80	
6	Architectural Coating	Architectural Coating	4/13/2022	6/1/2022	5	36	

Acres of Grading (Site Preparation Phase): 49.5

Acres of Grading (Grading Phase): 40

Acres of Paving: 2.2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 5,750

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	0	8.00	231	0.29

Building Construction	Forklifts	0	7.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	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
Demolition	5	13.00	0.00	234.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	256.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	0	40.00	16.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	8.00	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

Clean Paved Roads

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5362	0.0000	1.5362	0.2326	0.0000	0.2326			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715		2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**1.5362**	**1.0409**	**2.5771**	**0.2326**	**0.9715**	**1.2041**		**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

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	0.0560	1.9043	0.3933	5.4500e-003	0.1239	6.0600e-003	0.1299	0.0339	5.8000e-003	0.0397		579.4990	579.4990	0.0265		580.1625
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	0.0443	0.0311	0.3048	9.5000e-004	0.1068	6.7000e-004	0.1075	0.0283	6.2000e-004	0.0289		94.9852	94.9852	2.1800e-003		95.0397
Total	**0.1002**	**1.9354**	**0.6981**	**6.4000e-003**	**0.2307**	**6.7300e-003**	**0.2374**	**0.0623**	**6.4200e-003**	**0.0687**		**674.4843**	**674.4843**	**0.0287**		**675.2022**

Mitigated Construction On-Site

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

Fugitive Dust					0.6567	0.0000	0.6567	0.0994	0.0000	0.0994			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715	0.0000	2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.6567**	**1.0409**	**1.6976**	**0.0994**	**0.9715**	**1.0709**	**0.0000**	**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

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	0.0560	1.9043	0.3933	5.4500e-003	0.1182	6.0600e-003	0.1243	0.0326	5.8000e-003	0.0384		579.4990	579.4990	0.0265		580.1625
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	0.0443	0.0311	0.3048	9.5000e-004	0.1012	6.7000e-004	0.1019	0.0270	6.2000e-004	0.0276		94.9852	94.9852	2.1800e-003		95.0397
Total	**0.1002**	**1.9354**	**0.6981**	**6.4000e-003**	**0.2195**	**6.7300e-003**	**0.2262**	**0.0595**	**6.4200e-003**	**0.0659**		**674.4843**	**674.4843**	**0.0287**		**675.2022**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457		2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**1.5908**	**0.7019**	**2.2926**	**0.1718**	**0.6457**	**0.8175**		**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

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	0.0612	2.0834	0.4303	5.9600e-003	0.1355	6.6300e-003	0.1421	0.0371	6.3400e-003	0.0435		633.9819	633.9819	0.0290		634.7077
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	0.0272	0.0191	0.1876	5.9000e-004	0.0657	4.1000e-004	0.0661	0.0174	3.8000e-004	0.0178		58.4524	58.4524	1.3400e-003		58.4860
Total	**0.0885**	**2.1025**	**0.6179**	**6.5500e-003**	**0.2012**	**7.0400e-003**	**0.2083**	**0.0546**	**6.7200e-003**	**0.0613**		**692.4343**	**692.4343**	**0.0304**		**693.1936**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6801	0.0000	0.6801	0.0734	0.0000	0.0734			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457	0.0000	2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**0.6801**	**0.7019**	**1.3819**	**0.0734**	**0.6457**	**0.7192**	**0.0000**	**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

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	0.0612	2.0834	0.4303	5.9600e-003	0.1294	6.6300e-003	0.1360	0.0356	6.3400e-003	0.0420		633.9819	633.9819	0.0290		634.7077
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	0.0272	0.0191	0.1876	5.9000e-004	0.0623	4.1000e-004	0.0627	0.0166	3.8000e-004	0.0170		58.4524	58.4524	1.3400e-003		58.4860
Total	**0.0885**	**2.1025**	**0.6179**	**6.5500e-003**	**0.1916**	**7.0400e-003**	**0.1987**	**0.0522**	**6.7200e-003**	**0.0589**		**692.4343**	**692.4343**	**0.0304**		**693.1936**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425		1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**6.5523**	**0.9158**	**7.4681**	**3.3675**	**0.8425**	**4.2100**		**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

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	0.0341	0.0239	0.2345	7.3000e-004	0.0822	5.2000e-004	0.0827	0.0218	4.7000e-004	0.0223		73.0656	73.0656	1.6800e-003		73.1075
Total	**0.0341**	**0.0239**	**0.2345**	**7.3000e-004**	**0.0822**	**5.2000e-004**	**0.0827**	**0.0218**	**4.7000e-004**	**0.0223**		**73.0656**	**73.0656**	**1.6800e-003**		**73.1075**

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					2.8011	0.0000	2.8011	1.4396	0.0000	1.4396			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425	0.0000	1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**2.8011**	**0.9158**	**3.7169**	**1.4396**	**0.8425**	**2.2821**	**0.0000**	**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

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	0.0341	0.0239	0.2345	7.3000e-004	0.0779	5.2000e-004	0.0784	0.0207	4.7000e-004	0.0212		73.0656	73.0656	1.6800e-003		73.1075
Total	**0.0341**	**0.0239**	**0.2345**	**7.3000e-004**	**0.0779**	**5.2000e-004**	**0.0784**	**0.0207**	**4.7000e-004**	**0.0212**		**73.0656**	**73.0656**	**1.6800e-003**		**73.1075**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	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	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	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	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0633	10.6478	11.7756	0.0178		0.5826	0.5826		0.5371	0.5371		1,709.1107	1,709.1107	0.5417		1,722.6524

Paving	0.0721					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1354**	**10.6478**	**11.7756**	**0.0178**		**0.5826**	**0.5826**		**0.5371**	**0.5371**		**1,709.1107**	**1,709.1107**	**0.5417**		**1,722.6524**

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	0.0511	0.0358	0.3517	1.1000e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334		109.5983	109.5983	2.5200e-003		109.6612
Total	**0.0511**	**0.0358**	**0.3517**	**1.1000e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**		**109.5983**	**109.5983**	**2.5200e-003**		**109.6612**

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	1.0633	10.6478	11.7756	0.0178		0.5826	0.5826		0.5371	0.5371	0.0000	1,709.1107	1,709.1107	0.5417		1,722.6524
Paving	0.0721					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1354**	**10.6478**	**11.7756**	**0.0178**		**0.5826**	**0.5826**		**0.5371**	**0.5371**	**0.0000**	**1,709.1107**	**1,709.1107**	**0.5417**		**1,722.6524**

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	0.0511	0.0358	0.3517	1.1000e-003	0.1168	7.7000e-004	0.1176	0.0311	7.1000e-004	0.0318		109.5983	109.5983	2.5200e-003		109.6612
Total	**0.0511**	**0.0358**	**0.3517**	**1.1000e-003**	**0.1168**	**7.7000e-004**	**0.1176**	**0.0311**	**7.1000e-004**	**0.0318**		**109.5983**	**109.5983**	**2.5200e-003**		**109.6612**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500		1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	0.0721					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0132**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**		**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

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	0.0475	0.0321	0.3226	1.0600e-003	0.1232	7.5000e-004	0.1240	0.0327	7.0000e-004	0.0334		105.5296	105.5296	2.2500e-003		105.5859
Total	**0.0475**	**0.0321**	**0.3226**	**1.0600e-003**	**0.1232**	**7.5000e-004**	**0.1240**	**0.0327**	**7.0000e-004**	**0.0334**		**105.5296**	**105.5296**	**2.2500e-003**		**105.5859**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500	0.0000	1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	0.0721					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0132**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**	**0.0000**	**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

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	0.0475	0.0321	0.3226	1.0600e-003	0.1168	7.5000e-004	0.1176	0.0311	7.0000e-004	0.0318		105.5296	105.5296	2.2500e-003		105.5859
Total	**0.0475**	**0.0321**	**0.3226**	**1.0600e-003**	**0.1168**	**7.5000e-004**	**0.1176**	**0.0311**	**7.0000e-004**	**0.0318**		**105.5296**	**105.5296**	**2.2500e-003**		**105.5859**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	1.1105					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**1.3150**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	0.0253	0.0171	0.1721	5.6000e-004	0.0657	4.0000e-004	0.0661	0.0174	3.7000e-004	0.0178		56.2825	56.2825	1.2000e-003		56.3125
Total	**0.0253**	**0.0171**	**0.1721**	**5.6000e-004**	**0.0657**	**4.0000e-004**	**0.0661**	**0.0174**	**3.7000e-004**	**0.0178**		**56.2825**	**56.2825**	**1.2000e-003**		**56.3125**

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	1.1105					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**1.3150**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	0.0253	0.0171	0.1721	5.6000e-004	0.0623	4.0000e-004	0.0627	0.0166	3.7000e-004	0.0170		56.2825	56.2825	1.2000e-003		56.3125
Total	**0.0253**	**0.0171**	**0.1721**	**5.6000e-004**	**0.0623**	**4.0000e-004**	**0.0627**	**0.0166**	**3.7000e-004**	**0.0170**		**56.2825**	**56.2825**	**1.2000e-003**		**56.3125**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.586711	0.038259	0.185486	0.120728	0.016377	0.005053	0.010699	0.024311	0.001622	0.001773	0.005406	0.002738	0.000835

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

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

Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.0449	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Unmitigated	0.0449	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004

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	0.0110					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Consumer Products	0.0339					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-005	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Total	**0.0449**	**0.0000**	**2.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**4.8000e-004**	**4.8000e-004**	**0.0000**		**5.1000e-004**

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	0.0110					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0339					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-005	0.0000	2.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		4.8000e-004	4.8000e-004	0.0000		5.1000e-004
Total	**0.0449**	**0.0000**	**2.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**4.8000e-004**	**4.8000e-004**	**0.0000**		**5.1000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

AERSCREEN 16216 / AERMOD 18081 08/26/19
21:17:18

TITLE: "STMARYSCONSTPM10.OUT"

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

SOURCE EMISSION RATE:	0.188E-02 g/s	0.149E-01 lb/hr	
VOLUME HEIGHT:	5.00 meters	16.40 feet	
INITIAL LATERAL DIMENSION:	142.00 meters	465.88 feet	
INITIAL VERTICAL DIMENSION:	1.00 meters	3.28 feet	
RURAL OR URBAN:	URBAN		
POPULATION:	1147000		

INITIAL PROBE DISTANCE = 5000. meters 16404. feet

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

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

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

25 meter receptor spacing: 216. meters - 5000. meters

Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	0.4745E-01	325.0	ANN

* = worst case flow sector

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

MIN/MAX TEMPERATURE: 275.0 / 301.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

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 ADUSTED

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
-1.28	0.043	-9.000	0.020	-999.	21.	5.9	1.000	1.63	0.21	0.50

HT	REF TA	HT
10.0	301.0	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
-1.28	0.043	-9.000	0.020	-999.	21.	5.9	1.000	1.63	0.21	0.50

HT	REF TA	HT
10.0	301.0	2.0

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

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
216.00	0.000	2625.00	0.2524E-02
225.00	0.000	2650.00	0.2503E-02
250.00	0.000	2675.00	0.2483E-02
275.00	0.000	2700.00	0.2463E-02
300.00	0.000	2725.00	0.2443E-02
325.00	0.4745E-01	2750.00	0.2424E-02
350.00	0.4189E-01	2775.00	0.2406E-02
375.00	0.3730E-01	2800.00	0.2388E-02
400.00	0.3354E-01	2825.00	0.2370E-02
425.00	0.3080E-01	2850.00	0.2353E-02
450.00	0.2837E-01	2875.00	0.2336E-02
475.00	0.2622E-01	2900.00	0.2320E-02
500.00	0.2429E-01	2925.00	0.2304E-02
525.00	0.2256E-01	2950.00	0.2288E-02
550.00	0.2099E-01	2975.00	0.2273E-02
575.00	0.1958E-01	3000.00	0.2257E-02
600.00	0.1841E-01	3025.00	0.2243E-02
625.00	0.1736E-01	3050.00	0.2228E-02
650.00	0.1640E-01	3075.00	0.2214E-02
675.00	0.1553E-01	3100.00	0.2200E-02
700.00	0.1473E-01	3125.00	0.2186E-02
725.00	0.1401E-01	3150.00	0.2172E-02
750.00	0.1333E-01	3175.00	0.2158E-02
775.00	0.1272E-01	3200.00	0.2145E-02
800.00	0.1214E-01	3225.00	0.2132E-02
825.00	0.1161E-01	3250.00	0.2119E-02
850.00	0.1112E-01	3275.00	0.2107E-02
875.00	0.1066E-01	3300.00	0.2095E-02
900.00	0.1023E-01	3325.00	0.2083E-02
925.00	0.9830E-02	3350.00	0.2071E-02
950.00	0.9454E-02	3375.00	0.2059E-02
975.00	0.9102E-02	3400.00	0.2048E-02
1000.00	0.8770E-02	3425.00	0.2037E-02
1025.00	0.8459E-02	3450.00	0.2025E-02
1050.00	0.8165E-02	3475.00	0.2015E-02
1075.00	0.7888E-02	3500.00	0.2004E-02
1100.00	0.7626E-02	3525.00	0.1993E-02
1125.00	0.7379E-02	3550.00	0.1983E-02
1150.00	0.7145E-02	3575.00	0.1972E-02
1175.00	0.6923E-02	3600.00	0.1962E-02
1200.00	0.6713E-02	3625.00	0.1952E-02

1225.00	0.6514E-02	3650.00	0.1942E-02
1250.00	0.6325E-02	3675.00	0.1933E-02
1275.00	0.6145E-02	3700.00	0.1923E-02
1300.00	0.5974E-02	3725.00	0.1914E-02
1325.00	0.5811E-02	3750.00	0.1904E-02
1350.00	0.5656E-02	3775.00	0.1895E-02
1375.00	0.5509E-02	3800.00	0.1886E-02
1400.00	0.5368E-02	3825.00	0.1877E-02
1425.00	0.5234E-02	3850.00	0.1868E-02
1450.00	0.5106E-02	3875.00	0.1859E-02
1475.00	0.4984E-02	3900.00	0.1850E-02
1500.00	0.4868E-02	3925.00	0.1842E-02
1525.00	0.4756E-02	3950.00	0.1833E-02
1550.00	0.4650E-02	3975.00	0.1825E-02
1575.00	0.4548E-02	4000.00	0.1816E-02
1600.00	0.4451E-02	4025.00	0.1808E-02
1625.00	0.4357E-02	4050.00	0.1800E-02
1650.00	0.4268E-02	4075.00	0.1792E-02
1675.00	0.4183E-02	4100.00	0.1784E-02
1700.00	0.4101E-02	4125.00	0.1776E-02
1725.00	0.4023E-02	4150.00	0.1768E-02
1750.00	0.3947E-02	4175.00	0.1760E-02
1775.00	0.3875E-02	4200.00	0.1752E-02
1800.00	0.3806E-02	4225.00	0.1745E-02
1825.00	0.3740E-02	4250.00	0.1737E-02
1850.00	0.3676E-02	4275.00	0.1730E-02
1875.00	0.3615E-02	4300.00	0.1722E-02
1900.00	0.3556E-02	4325.00	0.1715E-02
1925.00	0.3499E-02	4350.00	0.1708E-02
1950.00	0.3445E-02	4375.00	0.1700E-02
1975.00	0.3393E-02	4400.00	0.1693E-02
2000.00	0.3343E-02	4425.00	0.1686E-02
2025.00	0.3294E-02	4450.00	0.1679E-02
2050.00	0.3248E-02	4475.00	0.1672E-02
2075.00	0.3203E-02	4500.00	0.1665E-02
2100.00	0.3159E-02	4525.00	0.1659E-02
2125.00	0.3118E-02	4550.00	0.1652E-02
2150.00	0.3078E-02	4575.00	0.1645E-02
2175.00	0.3039E-02	4600.00	0.1638E-02
2200.00	0.3002E-02	4625.00	0.1632E-02
2225.00	0.2966E-02	4650.00	0.1625E-02
2250.00	0.2931E-02	4675.00	0.1619E-02
2275.00	0.2897E-02	4700.00	0.1612E-02
2300.00	0.2865E-02	4725.00	0.1606E-02
2325.00	0.2833E-02	4750.00	0.1600E-02
2350.00	0.2803E-02	4775.00	0.1593E-02
2375.00	0.2773E-02	4800.00	0.1587E-02
2400.00	0.2745E-02	4825.00	0.1581E-02

2425.00	0.2717E-02	4850.00	0.1575E-02
2450.00	0.2691E-02	4875.00	0.1569E-02
2475.00	0.2665E-02	4900.00	0.1563E-02
2500.00	0.2639E-02	4925.00	0.1557E-02
2525.00	0.2615E-02	4950.00	0.1551E-02
2550.00	0.2591E-02	4975.00	0.1545E-02
2575.00	0.2568E-02	5000.00	0.1539E-02
2600.00	0.2546E-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	0.5222E-01	0.5222E-01	0.4700E-01	0.3133E-01	0.5222E-02

DISTANCE FROM SOURCE 307.00 meters

IMPACT AT THE AMBIENT BOUNDARY	0.000	0.000	0.000	0.000	0.000

DISTANCE FROM SOURCE 216.00 meters

AERSCREEN 16216 / AERMOD 18081 08/26/19
21:25:50

TITLE: "STMARYSCONSTPM25.OUT"

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

SOURCE EMISSION RATE:	0.397E-02	g/s	0.315E-01	lb/hr
VOLUME HEIGHT:	5.00	meters	16.40	feet
INITIAL LATERAL DIMENSION:	142.00	meters	465.88	feet
INITIAL VERTICAL DIMENSION:	1.00	meters	3.28	feet
RURAL OR URBAN:	URBAN			
POPULATION:	1147000			

INITIAL PROBE DISTANCE = 5000. meters 16404. feet

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

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

********** PROBE ANALYSIS **********
25 meter receptor spacing: 306. meters - 5000. meters

SECTOR	Zo ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	0.1107	306.3	ANN

* = worst case flow sector

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

MIN/MAX TEMPERATURE: 275.0 / 301.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

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 ADUSTED

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
-1.28	0.043	-9.000	0.020	-999.	21.	5.9	1.000	1.63	0.21	0.50

HT	REF TA	HT
10.0	301.0	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
-1.28	0.043	-9.000	0.020	-999.	21.	5.9	1.000	1.63	0.21	0.50

HT	REF TA	HT
10.0	301.0	2.0

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

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
306.30	0.1107	2675.00	0.5244E-02
325.00	0.1002	2700.00	0.5202E-02
350.00	0.8847E-01	2725.00	0.5160E-02
375.00	0.7879E-01	2750.00	0.5120E-02
400.00	0.7084E-01	2775.00	0.5081E-02
425.00	0.6505E-01	2800.00	0.5043E-02
450.00	0.5993E-01	2825.00	0.5006E-02
475.00	0.5538E-01	2850.00	0.4970E-02
500.00	0.5130E-01	2875.00	0.4934E-02
525.00	0.4764E-01	2900.00	0.4899E-02
550.00	0.4434E-01	2925.00	0.4865E-02
575.00	0.4135E-01	2950.00	0.4832E-02
600.00	0.3889E-01	2975.00	0.4800E-02
625.00	0.3666E-01	3000.00	0.4768E-02
650.00	0.3464E-01	3025.00	0.4737E-02
675.00	0.3280E-01	3050.00	0.4707E-02
700.00	0.3112E-01	3075.00	0.4677E-02
725.00	0.2958E-01	3100.00	0.4646E-02
750.00	0.2816E-01	3125.00	0.4617E-02
775.00	0.2686E-01	3150.00	0.4587E-02
800.00	0.2565E-01	3175.00	0.4559E-02
825.00	0.2453E-01	3200.00	0.4531E-02
850.00	0.2349E-01	3225.00	0.4504E-02
875.00	0.2252E-01	3250.00	0.4477E-02
900.00	0.2161E-01	3275.00	0.4450E-02
925.00	0.2076E-01	3300.00	0.4424E-02
950.00	0.1997E-01	3325.00	0.4399E-02
975.00	0.1922E-01	3350.00	0.4374E-02
1000.00	0.1852E-01	3375.00	0.4349E-02
1025.00	0.1787E-01	3400.00	0.4325E-02
1050.00	0.1725E-01	3425.00	0.4301E-02
1075.00	0.1666E-01	3450.00	0.4278E-02
1100.00	0.1611E-01	3475.00	0.4255E-02
1125.00	0.1559E-01	3500.00	0.4232E-02
1150.00	0.1509E-01	3525.00	0.4210E-02
1175.00	0.1462E-01	3550.00	0.4188E-02
1200.00	0.1418E-01	3575.00	0.4166E-02
1225.00	0.1376E-01	3600.00	0.4145E-02
1250.00	0.1336E-01	3625.00	0.4124E-02
1275.00	0.1298E-01	3650.00	0.4103E-02
1300.00	0.1262E-01	3675.00	0.4082E-02

1325.00	0.1227E-01	3700.00	0.4062E-02
1350.00	0.1195E-01	3725.00	0.4042E-02
1375.00	0.1164E-01	3750.00	0.4022E-02
1400.00	0.1134E-01	3775.00	0.4003E-02
1425.00	0.1106E-01	3800.00	0.3983E-02
1450.00	0.1079E-01	3825.00	0.3964E-02
1475.00	0.1053E-01	3850.00	0.3945E-02
1500.00	0.1028E-01	3875.00	0.3927E-02
1525.00	0.1005E-01	3900.00	0.3908E-02
1550.00	0.9821E-02	3925.00	0.3890E-02
1575.00	0.9606E-02	3950.00	0.3872E-02
1600.00	0.9400E-02	3975.00	0.3854E-02
1625.00	0.9204E-02	4000.00	0.3836E-02
1650.00	0.9015E-02	4025.00	0.3819E-02
1675.00	0.8835E-02	4050.00	0.3802E-02
1700.00	0.8662E-02	4075.00	0.3784E-02
1725.00	0.8496E-02	4100.00	0.3767E-02
1750.00	0.8338E-02	4125.00	0.3751E-02
1775.00	0.8185E-02	4150.00	0.3734E-02
1800.00	0.8039E-02	4175.00	0.3718E-02
1825.00	0.7899E-02	4200.00	0.3701E-02
1850.00	0.7764E-02	4225.00	0.3685E-02
1875.00	0.7635E-02	4250.00	0.3669E-02
1900.00	0.7511E-02	4275.00	0.3653E-02
1925.00	0.7391E-02	4300.00	0.3638E-02
1950.00	0.7277E-02	4325.00	0.3622E-02
1975.00	0.7166E-02	4350.00	0.3607E-02
2000.00	0.7060E-02	4375.00	0.3592E-02
2025.00	0.6958E-02	4400.00	0.3577E-02
2050.00	0.6859E-02	4425.00	0.3562E-02
2075.00	0.6765E-02	4450.00	0.3547E-02
2100.00	0.6673E-02	4475.00	0.3532E-02
2125.00	0.6585E-02	4500.00	0.3518E-02
2150.00	0.6501E-02	4525.00	0.3503E-02
2175.00	0.6419E-02	4550.00	0.3489E-02
2200.00	0.6340E-02	4575.00	0.3475E-02
2225.00	0.6264E-02	4600.00	0.3461E-02
2250.00	0.6190E-02	4625.00	0.3447E-02
2275.00	0.6119E-02	4650.00	0.3433E-02
2300.00	0.6050E-02	4675.00	0.3419E-02
2325.00	0.5984E-02	4700.00	0.3406E-02
2350.00	0.5920E-02	4725.00	0.3392E-02
2375.00	0.5858E-02	4750.00	0.3379E-02
2400.00	0.5798E-02	4775.00	0.3366E-02
2425.00	0.5739E-02	4800.00	0.3352E-02
2450.00	0.5683E-02	4825.00	0.3339E-02
2475.00	0.5628E-02	4850.00	0.3327E-02
2500.00	0.5575E-02	4875.00	0.3314E-02

2525.00	0.5524E-02	4900.00	0.3301E-02
2550.00	0.5474E-02	4925.00	0.3288E-02
2575.00	0.5425E-02	4950.00	0.3276E-02
2600.00	0.5378E-02	4975.00	0.3264E-02
2625.00	0.5332E-02	5000.00	0.3251E-02
2650.00	0.5287E-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	0.1107	0.1107	0.9965E-01	0.6643E-01	0.1107E-01

DISTANCE FROM SOURCE 306.30 meters

IMPACT AT THE AMBIENT BOUNDARY	0.1107	0.1107	0.9965E-01	0.6643E-01	0.1107E-01

DISTANCE FROM SOURCE 306.30 meters

MVTC Construction Risk Calculations

	$\mu g/m^3$
1 Hour Avg Concentration:	0.05222
Annual Avg Concentration:	0.00522

Cancer Risk

DOSEair = (Cair*(BR/BW)*A*EF*10^{-6})	3.49865E-06

Risk = DOSEair * CPF * ASF * ED/AT * FAH	1.09041E-06

		in one million
Cancer Risk:	Construction Exposure	1.09

Threshold: 10 in one million

	DOSEair		mg/kg-d	Dose through inhalation
	CPF	1.1	$(mg/kg/day)^{-1}$	Cancer Potency Factor for DPM
BR/BW*	BR/BW	944	L/kg	Daily Breathing rate normalized to body weight
	10^{-6}	1.00E-06		Micrograms to milligrams conversions, liters to cubic meters conversion
	Cair	0.00522	ug/m^3	Concentration in air (ug/m^3), modeled annual average concentration
	A	1		Inhalation absorption factor
	EF	0.71	days/year	Exposure frequency (days/year)
ED	ED	1	years	Exposure duration (years)
	AT	30	years	Averaging time period over which exposure is averaged
ASF**	ASF (3rd trimester - 2 years)	10		Age Sensitivity Factor
	ASF (2 - 16 years)	3		
	ASF (16 - 70 years)	1		
FAH	FAH (3rd trimester - 2 years)	0.85		Fraction of time spent at home (unitless)
	FAH (2 - 16 years)	0.72		
	FAH (16 - 70 years)	0.73		

* BR/BW is a weighted average of the 95th percentile (3 months at 361, 12 months at 1090 L/kg)

** ASF conservatively uses 10 for construction period.

Chronic Noncancer Hazard

Hazard Quotient = C_i/REL_i

C_i	5.22E-03	Concentration (annual average)
REL_i	5	Reference Exposure Level
HQ =	0.0010	
Threshold:	1	

Acute NonCancer Hazard

Acute HQ = Maximum Hourly Concentration/Acute REL

Max Hourly	5.22E-03
Acute REL (Acrolein)	2.5
Acute HQ =	0.0021
Threshold:	1