Appendix C

Air Quality Technical Report

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COSTCO COMMERCIAL CENTER AIR QUALITY TECHNICAL REPORT

FRESNO, CALIFORNIA

RAMBOLL

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AB	Assembly Bill
ACC	Advanced Clean Cars
AEI	annual emissions inventory
AERMOD	American Meteorological Society/Environmental Protection Agency regulatory air dispersion model
AP-42	United States Environmental Protection Agency's Compilation of Air Pollutant Emission Factors
APCDs	Air Pollution Control Districts
AQ	air quality
AQAP	Air Quality Attainment Plan
AQMDs	Air Quality Management Districts
ATCM	Airborne Toxic Control Measure
ASFs	age sensitivity factors
AvgHP	Maximum rated average horsepower
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod®	California Emission Estimator Model®
CAP	criteria air pollutant
CARB	California Air Resources Board
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO	carbon monoxide
CO_2	carbon dioxide
cREL	chronic reference exposure level
CUP	conditional use permit
CY	cubic yard
DPM	Diesel Particulate Matter
DTSC	Department of Toxic Substances Control
EF	emission factor
EIR	Environmental Impact Report
EMFAC	EMission FACtors model
EVR	Enhanced vapor recovery
FAH	Fraction of time at home
g/m^3	gram/cubic meter
GDF	gasoline dispensing facility
GHG	greenhouse gas
HARP	Hot Spots Analysis and Reporting Program
HIA	acute hazard index
HIC	chronic hazard index
HIs	hazard indices
HQ	hazard quotient
HRA	health risk assessment
LDR	Land Disposal Restrictions
LLC	Limited Liability Company

Acronym	Definition
LOS	level of service
MDO	market delivery operation
MSW	municipal solid waste
MT	metric tonnes
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Datasets
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NHTSA	National Highway Traffic Safety Administration
NO	Nitric oxide
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
O_3	ozone
OEHHA	California Office of Environmental Health Hazard Assessment
OFFROAD	Off-road Emissions Inventory Program model
Pb	Lead
PM	particulate matter
PM10	particulate matter less than 10 microns in diameter
PM2.5	particulate matter less than 2.5 microns in diameter
ppm	parts per million by volume
Ramboll	Ramboll US Consulting, Inc.
RCRA	Resource Conservation and Recovery Act
REL	reference exposure level
ROG	reactive organic gases
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SAFE	Safer Affordable Fuel-Efficient
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO2	Sulfur Dioxide
SOx	sulfur oxide
TACs	Toxic Air Contaminant
TRUs	transportation refrigeration units
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Survey
VDECS	Verified Diesel Emission Control Strategies
VMT	Vehicle miles traveled
VOCs	Volatile Organic Compounds
ZEV	zero emission vehicle

1. INTRODUCTION

Ramboll US Consulting, Inc. (Ramboll) was retained to prepare an Air Quality (AQ) Technical Report for the proposed Costco warehouse and gasoline dispensing facility in Fresno, California (Project).

This AQ Technical Report analyzes the Project's impacts on air quality from construction and operations. In particular, this report describes the existing setting of the Project site, describes the relevant regulatory setting, discusses the methodology used to evaluate AQ emissions related to the Project, and evaluates potential impacts related to AQ that would be affected as a result of implementation of the Project.

1.1 Existing Conditions

The existing 22.4-acre site is currently undeveloped, located within the Bullard Community Plan Area, and designated by both the General Plan and zoning as Community Commercial. The location of the site is in Fresno, California at West Herndon Avenue and North Riverside Drive.

1.2 Project Analysis

The "Project" is defined as Project operation of the newly constructed Costco. Costco Wholesale Corporation (Costco) proposes to construct the Costco Commercial Center, which comprises a new Costco facility (including loading docks and internal space to provide last-mile home delivery of big and bulky items) with an attached tire center and a detached gas station and drive-through car wash in the City of Fresno.

The Project would develop a new Costco retail building; gas station; car wash; and associated parking areas, driveways, and other supporting infrastructure. Costco Wholesale is proposing to construct a wholesale retail facility with approximately 178,000 square feet (sq. ft.); of which approximately 57,000 sq. ft. would be reserved for storage and receiving at the northeast corner of W. Herndon Ave. and N. Riverside Dr (APN 50302012). The project involves the construction of a Costco retail facility that includes an attached tire center, as well as a detached gas station and a drive-through car wash. The project would include a Costco members-only gas station on the northern portion of the project site adjacent to West Spruce Avenue. The facility would include an approximately 11,500 square-foot canopy and a 125 square-foot controller enclosure. There would be four covered fueling islands, each with four two-sided fuel dispensers to provide for the fueling of eight cars at each island, for a total of 32 fueling positions. A Costco members-only automated carwash would be located at the northeastern corner of the project site, adjacent to the gas station. The car wash structure would be approximately 4,800 sq. ft. The project would have its main access points along North Riverside Drive and include approximately 889 parking stalls.

2. ENVIRONMENTAL AND REGULATORY BACKGROUND

2.1 Criteria Air Pollutants

Criteria air pollutants (CAPs) are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive people from illness or discomfort. Pollutants of concern include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and lead. In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants. These pollutants are discussed in the following paragraphs.

2.1.1 Ozone

O_3 is a colorless gas that is formed in the atmosphere when volatile organic compounds (VOCs), sometimes referred to as reactive organic gases, and NO_x react in the presence of ultraviolet sunlight. O_3 is not a primary pollutant; it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. The primary sources of VOCs and NO_X, the precursors of O_3, are automobile exhaust and industrial sources. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in the San Joaquin Valley can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes.

2.1.2 Nitrogen Dioxide

Most NO_2, like O_3, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_X and are major contributors to O_3 formation. The primary sources of NO, the precursor to NO_2, include automobile exhaust and industrial sources. High concentrations of NO_2 can cause breathing difficulties and result in a brownish-red cast to the atmosphere, causing reduced visibility. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis, and some increase in bronchitis in children (2 and 3 years old) has also been observed at concentrations below 0.3 parts per million by volume (ppm).

2.1.3 Carbon Monoxide

Carbon Monoxide (CO) is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the Project location, automobile exhaust accounts for the majority of CO emissions. CO is a non-reactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when

surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February. The highest levels of CO typically occur during the colder months of the year when inversion conditions, where a layer of warm air sits atop cool air, are more frequent and can trap pollutants close to the ground. In terms of health, CO competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can be dizziness, fatigue, and impairment of central nervous system functions.

2.1.4 Sulfur Dioxide

Sulfur Dioxide (SO_2) is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits placed on the sulfur content of fuels. SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 can also yellow plant leaves and erode iron and steel.

2.1.5 Particulate Matter

Particulate matter (PM) pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Fine particulate matter, or $PM_{2.5}$, is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., motor vehicles, power generation, and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_X), NO_X, and VOCs. Inhalable or coarse particulate matter, or PM_{10}, is about one- seventh the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the bloodstream, causing damage elsewhere in the body. Additionally, these substances can transport absorbed gases, such as chlorides or ammonium, into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility.

2.1.6 Lead

Lead (Pb) in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline, the manufacturing of batteries, paint, ink, ceramics, ammunition, and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead.

Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emission sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth.

2.1.7 Sulfates

Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere. Sulfates can result in respiratory impairment, as well as reduced visibility.

2.1.8 Vinyl Chloride

Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air can cause nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

2.1.9 Hydrogen Sulfide

Hydrogen sulfide is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of hydrogen sulfide include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to hydrogen sulfide can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

2.1.10 Visibility-Reducing Particles

Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the view shed of natural scenery, reduced airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for $PM_{2.5}$ described above.

2.2 Non-Criteria Air Pollutants

2.2.1 Toxic Air Contaminants

A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a toxic air contaminant (TAC). Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, waste processing facilities and laboratories; mobile sources such as automobiles; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and non-carcinogenic effects. Non-carcinogenic effects typically affect one or more target organ systems and may be experienced either on short-term (acute) or long-term (chronic) exposure to a given TAC.

2.2.2 Diesel Particulate Matter

Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. CARB classified "particulate emissions from diesel-fueled engines" (DPM; 17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars, and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM.[1] To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000.

2.3 Regulatory Setting

2.3.1 Federal and State Ambient Air Quality Standards for Criteria Air Pollutants

The Federal Clean Air Act (CAA) requires the adoption of National Ambient Air Quality Standards (NAAQS), which are periodically updated, to protect the public health and welfare from the effects of air pollution. Current federal standards are set for SO_2, CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb.[2]

The State of California also has established additional standards, known as the California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. The current NAAQS and CAAQS are shown in **Table 2-1**.

Specific geographic areas are classified as either "attainment" or "non-attainment" areas for each pollutant based upon the comparison of measured data with the NAAQS and CAAQS. Those areas designated as "non-attainment" for purposes of NAAQS compliance are required to prepare regional air quality plans, which set forth a strategy for bringing an area into compliance with the standards. These regional air quality plans developed to meet federal requirements are included in an overall program referred to as the State Implementation Plan (SIP). If the SIP is deemed acceptable, the United States Environmental Protection Agency (USEPA) will delegate responsibility for implementation pursuant to the SIP to the State and/or its air districts therein.

Whenever the USEPA revises or establishes a new NAAQS, the State and the USEPA have specific obligations to ensure that the NAAQS is met.[3] These are listed below:

- The USEPA must designate areas as meeting (attainment areas) or not meeting (non-attainment areas) the NAAQS within two years after its promulgation.
- States must submit "infrastructure SIPs" to show that they have the basic air quality management program components in place to implement the NAAQS within three years after its promulgation.

[1] CARB. 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. Available at: https://ww2.arb.ca.gov/sites/default/files/classic//diesel/documents/rrpfinal.pdf. Accessed: February 2022.

[2] NAAQS. Available at: https://www.epa.gov/criteria-air-pollutants/naaqs-table. Accessed: February 2022.

[3] USEPA. NAAQS Implementation Process. Available at: https://www.epa.gov/criteria-air-pollutants/naaqs-implementation-process. Accessed: February 2022.

- States must submit non-attainment area SIPs that outline the strategies and emission control measures that will improve air quality and make the area meet the NAAQS within 18 to 36 months after designation.

The steps involved in the SIP process are described below.[4]

- SIPs must be developed with public input and be formally adopted by the State and submitted to the USEPA by the Governor's designee (CARB in California).
- The USEPA reviews each SIP and proposes to approve or disapprove all or part it. The public is then provided with an opportunity to comment on the USEPA's proposed action. The USEPA considers public input before taking final action on a State's plan.
- If the USEPA approves all or part of a SIP, those control measures are enforceable in federal court. In the event a State fails to submit an approvable SIP or if the USEPA disapproves a SIP, the USEPA is required to develop a Federal Implementation Plan.

Table 2-2 summarizes the attainment status of Fresno County (San Joaquin Valley Air Pollution Control District) for the pollutants regulated by the NAAQS and CAAQS.[5] As seen in **Table 2-2**, Fresno County is currently in attainment (including where unclassified) for: the federal PM_{10} standard, the federal and State CO standards, the federal and State NO_2 standards, the federal and State SO_2 standards, the federal and state lead standards, and the State visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride standards. However, as also shown in **Table 2-2**, Fresno County is currently designated as nonattainment for the State 1-hour O_3 standard, the federal and State 8-hour O_3 standards, the State PM_{10} standards, and the federal and State $PM_{2.5}$ standards.[6, 7, 8]

2.3.2 Federal Heavy-duty Engines and Vehicles Fuel Efficiency Standards

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

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the USEPA and NHTSA announced fuel economy and GHG standards for medium- and

[4] USEPA. State Implementation Plan Development Process. Available at: https://www.epa.gov/criteria-air-pollutants/naaqs-implementation-process. Accessed: February 2022.

[5] USEPA. Non-attainment Areas for Criteria Pollutants (Green Book). Available at: https://www.epa.gov/green-book. Accessed: February 2022.

[6] Ibid.

[7] California standard attainment status based on CARB website. Available at: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed: February 2022.

[8] SJVAPCD Attainment status. Available at: https://www.valleyair.org/aqinfo/attainment.htm. Accessed: February 2022.

heavy-duty trucks for model years 2014–2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles.

In August 2016, the USEPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types of sizes of buses and work trucks. The final standards are expected to lower carbon dioxide emissions by approximately 1.1 billion metric tons (MT) and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles sold under the program.[9]

In August 2017, the USEPA asked for additional information and data relevant to assessing whether the GHG emissions standards for model years 2022-2025 remain appropriate. In early 2018, the USEPA Administrator announced that the midterm evaluation for the GHG emissions standards for cars and light-duty trucks for model years 2022-2025 was completed and stated his determination that the current standards should be revised in light of recent data. Subsequently, in April 2018, the USEPA and NHTSA proposed to amend certain existing Corporate Average Fuel Economy (CAFE) standards for passenger cars and light trucks and establish new standards, covering model years 2022-2025. Compared to maintaining the post-2020 standards now in place, the pending proposal would increase U.S. fuel consumption.[10] California and other states have announced their intent to challenge federal actions that would delay or eliminate GHG reductions. In April 2020, NHTSA and EPA amended the CAFE and GHG emissions standards for passenger cars and light trucks and established new less stringent standards, covering model years 2021 through 2026.

On September 27, 2019, the USEPA and NHTSA published the SAFE Rule (Part One).[11] The SAFE Rule (Part One) went into effect in November 2019, and revoked California's authority to set its own GHGs standards and set zero emission vehicle mandates in California. The SAFE Rule (Part One) freezes new zero emission vehicles (ZEV) sales at model year 2020 levels for year 2021 and beyond, and will likely result in a lower number of future ZEVs and a corresponding greater number of future gasoline internal combustion engine vehicles. In response to the USEPA's adoption of the SAFE Rule (Part One), CARB has issued guidance regarding the adjustment of vehicle emissions factors to account for the rule's implications

[9] USEPA and NHTSA. 2016. Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium and Heavy-Duty Engines and Vehicles – Phase 2. Available at: https://www.gpo.gov/fdsys/pkg/FR-2016-10-25/pdf/2016-21203.pdf. Accessed: February 2022.

[10] NHTSA. 2018. Federal Register, Vol. 83, No. 72, Rules & Regulations, Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light Duty Vehicles. April 13. Available at: https://www.federalregister.gov/documents/2018/04/13/2018-07364/mid-term-evaluation-of-greenhouse-gas-emissions-standards-for-model-year-2022-2025-light-duty. Accessed: February 2022.

[11] USEPA and NHTSA. 2019. Federal Register, Vol. 84, No. 188, The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program. September 27. Available at: https://www.govinfo.gov/content/pkg/FR-2019-09-27/pdf/2019-20672.pdf. Accessed: February 2022.

on criteria air pollutant and greenhouse gas emissions.[12,13] The SAFE Rule is subject to ongoing litigation and on February 8, 2021, the D.C. Circuit Court of Appeals granted the Biden Administration's motion to stay litigation over Part 1 of the SAFE Rule. On April 22 and April 28, 2021, respectively, NHTSA and USEPA formally announced their intent to reconsider the Safe Rule (Part One).[14] In August 2021, USEPA proposed to revise existing national greenhouse gas (GHG) emissions standards for passenger cars and light trucks for Model Years 2023- 2026 to make the standards more stringent. The NHTSA finalized the Corporate Average Fuel Economy Pre-emption rulemaking to withdraw its portions of the SAFE I Rule on December 21, 2021.[15] On March 9, 2022, USEPA reinstated California's authority under the Clean Air Act to implement its own GHG emission standards and ZEV sales mandate and entirely rescinded the SAFE Rule (Part One).

In December 2021, the USEPA finalized federal GHG emissions standards for passenger cars and light trucks for Model Years 2023 through 2026. These standards are the strongest vehicle emissions standards ever established for the light-duty vehicle sector and are based on sound science and grounded in a rigorous assessment of current and future technologies. The updated standards will result in avoiding more than 3 billion tons of GHG emissions through 2050.[16]

2.3.3 Federal Hazardous Air Pollutants Program

The 1977 CAA Amendments required the USEPA to identify National Emissions Standards for Hazardous Air Pollutants (NESHAPs) to protect the public health and welfare. Hazardous air pollutants include certain VOCs, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 CAA Amendments, which expanded the control program for hazardous air pollutants, 189 substances and chemical families were identified as hazardous air pollutants.

2.3.4 California's Air Toxics Program

The state Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and non-carcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) hazardous air pollutants.

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[12] CARB. 2019. EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicle Rule Part One. November 20. Available at: https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf. Accessed: February 2022.

[13] CARB. 2020. EMFAC Off-Model Adjustment Factors for Carbon Dioxide Emissions to Account for the SAFE Vehicles Rule Part One and the Final SAFE Rule. June 26. Available at: https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf. Accessed: February 2022.

[14] USEPA. 2021. Federal Register, Vol. 86, No. 80, California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a previous Withdrawal of a Waiver of Preemption; Opportunity for Public Hearing and Public Comment. April 28. Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/notice-reconsideration-previous-withdrawal-waiver. Accessed: February 2022.

[15] NHTSA. Available at: https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy. Accessed: May 2022.

[16] USEPA. 2021. Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026. Available at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions. Accessed: January 2022.

The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not reduce the quantity of air toxics emissions. Instead, under AB 2588, TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. The plan is anticipated to result in an 85% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. All of these regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. There also are several Airborne Toxic Control Measures that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

2.3.5 California Health and Safety Code Section 41700

This section of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

2.3.6 California's Pavley Standards

AB 1493 ("the Pavley Standard" or AB 1493) required CARB to adopt regulations by January 1, 2005, to reduce GHG emissions from non-commercial passenger vehicles and light-duty trucks of model year 2009 through 2016.

CARB's approach to passenger vehicles (cars and light trucks), under AB 1493, combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards. This new approach also includes efforts to support and accelerate the numbers of plug-in hybrids and zero-emission vehicles in California. These standards will apply to all passenger and light-duty trucks used by customers, employees of and deliveries to the Project. While AB 1493 focuses on the reduction of GHG emissions, it is anticipated that this regulation would also help reduce criteria air pollutants.

2.3.7 California's Advanced Clean Cars

In January 2012, CARB approved the Advanced Clean Cars (ACC) program,[17] a new emissions-control program for model year 2017 through 2025. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emission vehicles. By 2025, when the rules will be fully implemented, the new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions. While ACC focuses on the reduction of GHG emissions, it is anticipated that this regulation would

[17] Advanced Clean Cars Program. Available at: https://ww2.arb.ca.gov/index.php/our-work/programs/advanced-clean-cars-program. Accessed: February 2022.

also help reduce criteria air pollutants. At the time of this writing, CARB has adopted the Advanced Clean Cars II (ACC II) regulations which "will seek to reduce criteria and greenhouse gas emissions from new light- and medium-duty vehicles beyond the 2025 model year and increase the number of zero emission vehicles (ZEV) for sale".[18]

2.3.8 California's Advanced Clean Trucks

In June 2020, CARB approved the Advanced Clean Trucks regulation, which has requirements for manufacturer ZEV sales and a one-time reporting requirement for large entities and fleets.[19] The Advanced Clean Truck Regulation is part of a holistic approach to accelerate a large-scale transition of zero-emission medium-and heavy-duty vehicles from Class 2b to Class 8. Manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines are required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 straight truck sales, and 40% of truck tractor sales. Large employers including retailers, manufacturers, brokers and others are required to report information about shipments and shuttle services. Fleet owners, with 50 or more trucks, are required to report about their existing fleet operations. This information helps to identify future strategies to ensure that fleets purchase available zero-emission trucks and place them in service where suitable to meet their needs.

2.3.9 California's Diesel Emissions Control Measures

CARB has adopted a number of Airborne Toxic Control Measures (ATCMs) to control diesel particulate emissions and emissions from in-use on- and off-road diesel-fueled vehicles. With the assistance of the Advisory Committee and its subcommittees, CARB developed and approved the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*[20] and the *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines*.[21] Various control measures adopted by CARB to reduce diesel emissions are summarized below.

2.3.9.1 ATCM: Diesel-Fueled Commercial Motor Vehicle Idling

This ATCM applies to diesel-fueled commercial motor vehicles with gross vehicular weight ratings of greater than 10,000 pounds that are or must be licensed for operation on highways. The measure limits idling of trucks to a maximum of 5 minutes, except when the vehicle is queuing.[22] While this ATCM focuses on the reduction of diesel particulate emissions as a toxic, this regulation would also help reduce criteria air pollutants.

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[18] Advanced Clean Cars II Program. Available at: https://ww2.arb.ca.gov/advanced-clean-cars-ii-meetings-workshops. Accessed: February 2022.

[19] CARB. 2020. Advanced Clean Trucks. Available at: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks. Accessed: February 2022.

[20] CARB. 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. Available at: https://www.arb.ca.gov/diesel/documents/rrpfinal.pdf. Accessed: February 2022.

[21] CARB. 2008. California's Diesel Risk Reduction Plan: Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines. Available at: https://www.arb.ca.gov/diesel/documents/rmg.htm. Accessed: February 2022.

[22] 13 CCR 2485: Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling. Available at: https://ww2.arb.ca.gov/sites/default/files/classic/msprog/truck-idling/13ccr2485_09022016.pdf. Accessed: February 2022.

2.3.9.2 ATCM: Stationary Compression Ignition Engines

This ATCM establishes emission standards and fuel use requirements for new and in-use stationary engines used in prime and emergency back-up applications (non-agricultural) and for new stationary engines used in agricultural applications.[23] While this ATCM focuses on the reduction of diesel particulate emissions as a toxic, this regulation would also help reduce criteria air pollutants.

2.3.9.3 In-Use Off-Road Diesel-Fueled Fleets

These regulations reduce diesel PM and NO_x emissions from in-use, off-road heavy-duty diesel vehicles in California. Such vehicles typically are used in construction, mining, and industrial operations. The regulations, among other requirements, impose limits on idling; require all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; restrict the adding of older vehicles into fleets; and require fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (VDECS) (i.e., exhaust retrofits).

The requirements and compliance dates of the regulations vary by fleet size. Large fleets have compliance deadlines each year from 2014 through 2023, medium fleets each year from 2017 through 2023, and small fleets each year from 2019 through 2028.[24] At the time of writing, CARB is in the process of developing a rule amendment. The target of the amendment aligns with the targets set out by the Draft 2020 Mobile Source Strategy, which sets a goal of reducing statewide NOx emissions from the construction and earth moving sector by 7.5 tpd by 2031.

2.3.9.4 Truck and Bus Regulation

The Truck and Bus Regulation (13 CCR 2025) requires diesel trucks and buses to be upgraded to reduce emissions; newer heavier trucks and buses must meet PM filter requirements; lighter and older heavier trucks must be replaced; and, by January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent to reduce PM and NOx emissions.

The regulation applies to nearly all privately- and federally-owned diesel-fueled trucks and buses, and to privately- and publicly-owned school buses with a gross vehicle weight rating greater than 14,000 pounds. The regulation provides a variety of flexibility options tailored to fleets operating low use vehicles, fleets operating in selected vocations like agricultural and construction, and small fleets of three or fewer trucks.

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[23] 17 CCR 93115: Airborne Toxic Control Measure for Stationary Compression Ignition (CI) Engines. Available at: https://govt.westlaw.com/calregs/Document/I32577B50D60811DE88AEDDE29ED1DC0A?originationContext=Search+Result&listSource=Search&viewType=FullText&navigationPath=Search%2fv3%2fsearch%2fresults%2fnavigation%2fi0ad62d2e00000160511f23fc18257bb0%3fstartIndex%3d1%26Nav%3dREGULATION_PUBLICVIEW%26contextData%3d(sc.Default)&rank=1&list=REGULATION_PUBLICVIEW&transitionType=SearchItem&contextData=(sc.Search)&t_T1=17&t_T2=93115&t_S1=CA+ADC+s. Accessed: February 2022.

[24] 13 CCR 2449: General Requirements for In-Use Off-Road Diesel-Fueled Fleets. Available at: https://govt.westlaw.com/calregs/Document/ID1C693E02DDD11E197D9B83B68A61150?originationContext=Search+Result&listSource=Search&viewType=FullText&navigationPath=Search%2fv3%2fsearch%2fresults%2fnavigation%2fi0ad62d2e000001605120fcc918257bd2%3fstartIndex%3d1%26Nav%3dREGULATION_PUBLICVIEW%26contextData%3d(sc.Default)&rank=1&list=REGULATION_PUBLICVIEW&transitionType=SearchItem&contextData=(sc.Search)&t_T1=13&t_T2=2449&t_S1=CA+ADC+s. Accessed: February 2022.

2.3.10 Local Regulations and Guidance

Air pollution often does not conform to city and/or county jurisdictional boundaries, and the State has been divided into air basins based on geographical and meteorological conditions. Air pollution within each air basin is regulated by the regional air pollution control districts/air quality management districts, in a manner that is consistent with and in furtherance of standards adopted by the USEPA and CARB. The Project site is located within the San Joaquin Valley Air Basin (SJVAB) and the jurisdictional boundaries of the San Joaquin Valley Air Pollution Control District (SJVAPCD).

2.3.10.1 San Joaquin Valley Air Pollution Control District

District Plans

While CARB is responsible for the regulation of mobile emission sources within the state, local Air Quality Management Districts (AQMDs) and Air Pollution Control Districts (APCDs) are responsible for enforcing standards and regulating stationary sources. The Project site is located within the SJVAB and is subject to the guidelines and regulations of the SJVAPCD.

The SJVAPCD is responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SJVAB. The SJVAPCD's air quality plans include emissions inventories to measure the sources of air pollutants, to evaluate how well different control methods have worked, and to show how air pollution will be reduced. The plans also use computer modelling to estimate future levels of pollution and to demonstrate that the Valley will meet air quality goals. The most recent plans are summarized below.

2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards

In November 2018, SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards.[25] This plan addresses the USEPA federal 1997 annual $PM_{2.5}$ standard and 24-hour $PM_{2.5}$ standard; the 2006 24-hour $PM_{2.5}$ standard; and the 2012 annual $PM_{2.5}$ standard. In the report, SJVAPCD included mobile source measures and a comprehensive suite of fiscally responsible local measures for stationary and area sources, including measures to further reduce emissions from industrial sources, residential wood burning and commercial charbroiling.

2016 Plan for the 2008 8-Hour Ozone Standard

In June 2016, SJVAPCD adopted the 2016 Plan for the 2008 8-hour Ozone Standard. [26] Through the comprehensive stationary and mobile source control strategies that previously have been adopted and that are now proposed in this plan, NO_x emissions in the SJVAB are expected to be reduced by over 60% between 2012 and 2031. As a result, the ambient ozone concentrations are projected to decrease dramatically in all areas of the Valley, such that future 8-hour ozone concentrations are expected to demonstrate attainment.

[25] SJVAPCD. 2018. 2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards. Available at: http://www.valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf. Accessed: February 2022.

[26] SJVAPCD (June 2016), "2016 Plan for the 2008 8-Hour Ozone Standard." Available at: https://www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016/Adopted-Plan.pdf. Accessed: February 2022.

District Rules and Regulations

The SJVAPCD is responsible for planning, implementing, and enforcing federal and state ambient standards in the SJVAB. Below is a list of SJVAPCD rules relevant to the Project:

Regulation II: Permits

Regulation II (Rules 2010-2550) contains a series of rules covering permitting requirements within the SJVAB. SJVAPCD regulations require any person constructing, altering, replacing or operating any source which emits, may emit, or may reduce emissions to obtain an Authority to Construct or a Permit to Operate.

Rule 3135: Dust Control Plan Fee

This rule requires the applicant to submit a fee in addition to a Dust Control Plan. The purpose of this fee is to recover the SJVAPCD's cost for reviewing these plans and conducting compliance inspections.[27]

Rule 4101: Visible Emissions

This rule applies to any source operation that emits or may emit air contaminants. The purpose of this rule is to prohibit the emissions of visible air contaminants to the atmosphere.[28]

Rule 4102: Nuisance

This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the Project or construction of the Project creates a public nuisance, it could be in violation and be subject to SJVAPCD enforcement action.[29]

Rule 4601: Architectural Coating

This rule limits VOC content in architectural coatings. This rule also contains requirements for architectural coatings storage, clean up and labeling.[30]

Rule 4622: Gasoline Transfer into Motor Vehicle Fuel Tanks

This rule applies to any gasoline storage and dispensing operation or mobile fueler from which gasoline is transferred into motor vehicle fuel tanks. The purpose of this rule is to limit emissions to gasoline vapors.[31]

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[27] SJVAPCD (October 2005), "Dust Control Plan Fee," Rule 3135. Available at: https://www.valleyair.org/rules/currntrules/2018/R3135-a2.pdf. Accessed: February 2022.

[28] SJVAPCD (February 2005), "Visible Emissions," Rule 4101. Available at: https://www.valleyair.org/rules/currntrules/r4101.pdf. Accessed: February 2022.

[29] SJVAPCD (May 1992), "Nuisance," Rule 4102. Available at: http://www.valleyair.org/rules/currntrules/r4102.pdf. Accessed: February 2022.

[30] SJVAPCD (April 1991), "Architectural Coatings," Rule 4601. Available at: http://www.valleyair.org/rules/currntrules/r4601.pdf. Accessed: February 2022.

[31] SJVAPCD (December 2013), "Gasoline Transfer into Motor Vehicle Fuel Tanks," Rule 4622. Available at: https://www.valleyair.org/rules/currntrules/Rule4622.pdf. Accessed: February 2022.

Rule 4641: Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations

Rule 4641 applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations. Asphalt paving operations associated with the Project will be subject to Rule 4641.[32]

Regulation VIII: Fugitive PM_{10} Prohibitions

Regulation VIII (Rules 8011-8081) contains a series of rules designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track out, etc. If a construction Project is 10 or more acres in area or will include moving, depositing or relocating more than 2,500 cubic yards (CY) per day of bulk materials on at least three days, then a Dust Control Plan must be submitted as specified in Section 6.3.1 of Rule 8021 (Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities). Construction activities shall not commence until the SJVAPCD has approved the Dust Control Plan. The Project may also be subject to additional provisions within Rule 8021, as well as Rule 8031 (Bulk Materials), Rule 8041 (Carryout and Track Out), Rule 8051 (Open Areas), Rule 8061 (Paved and Unpaved Roads), and Rule 8071 (Unpaved Vehicle/Equipment Traffic Areas). For example, Rule 8061 places thresholds and requirements on limiting Visible Dust Emissions from unpaved road segments to 20% opacity.[33]

Rule 9510: Indirect Source Rule

This rule requires the applicants of certain development projects which equal or exceed established applicability thresholds to apply to the SJVAPCD when applying for the development's last discretionary approval.[34] The rule is applicable for a development project which upon full buildout would include 2,000 square feet of commercial space as well as a large development project which upon full buildout would include 10,000 square feet of commercial space. This Project includes a commercial space (warehouse) greater than 10,000 square feet. Projects subject to the rule are required to quantify indirect emissions (mobile source emissions), area source emissions and construction exhaust emissions and to mitigate a portion of these emissions. The Indirect Source Rule was adopted December 2005 and last amended December 2017. Rule 9510 was adopted to reduce the impacts of growth in emissions from all new development in the San Joaquin Valley. Developers of projects subject to Rule 9510 must reduce emissions occurring during construction and operational phases through on-site measures or pay off-site mitigation fees. The reductions for construction equipment exhaust emissions (for equipment greater than 50 horsepower) are 20% of the total NOx emissions and 45% of the total PM_{10} exhaust emissions. For operation, the operational baseline NOx emissions must be reduced by 33.3% and operational baseline PM_{10} emissions by 50% over a period of ten years. One hundred percent of all off-site mitigation fees are used by the SJVAPCD to fund emission reduction projects through its Incentives Programs, achieving emission reductions on behalf of the project. The emission

[32] SJVAPCD (April 1991), "Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations," Rule 4641. Available at: http://www.valleyair.org/rules/currntrules/r4641.pdf. Accessed: February 2022.

[33] SJVAPCD (November 2001), "Paved and Unpaved Roads," Rule 8061. Available at: https://www.valleyair.org/rules/currntrules/r8061.pdf. Accessed: February 2022.

[34] SJVAPCD Rule 9510 (Indirect Source Review). Available online at: https://www.valleyair.org/rules/currntrules/r9510-a.pdf. Accessed: February 2022.

reductions expected from the rule allow the SJVAPCD to achieve attainment of the federal air quality standards for ozone by 2031.[35]

2.3.10.2 City of Fresno General Plan

The City of Fresno's General Plan was adopted in December 2014.[36] The General Plan includes a Resource Conservation and Resilience section which addresses both air quality and greenhouse gas emissions. The City acknowledges its role in improving air quality by supporting and leading, where appropriate, regional, State and federal programs and actions for the improvement of air quality, especially the SJVAPCD's efforts to monitor and control air pollutants from both stationary and mobile sources, which is summarized in Policy RC-4-a. Other implementing policies under the overall RC-4 objective in the General Plan seek to take necessary actions to achieve and maintain compliance with State and federal air quality standards for criteria pollutants.

The City of Fresno's General Plan and Development Code Update Master Environmental Impact Report[37] outlines the local air quality and assesses carbon monoxide hotspot impacts. The report states that no CO hotspot modeling should be required for new projects during General Plan Buildout unless intersection volumes exceed 36,000 peak hour trips.

2.4 Environmental Setting

2.4.1 Local Air Quality Monitoring Data

The Project is located within the SJVAB. The SJVAB consists of eight counties: Fresno, Kern (western and central), Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Cumulatively, these counties make up about 16% of California's geographic area, making the SJVAB the second largest air quality basin in the State.

The SJVAB has 37 monitoring stations to measure air quality; 24 operated by the SJVAPCD, 2 by the National Park Service, 2 by tribal groups, 9 by CARB, and 1 jointly operated by the SJVAPCD and CARB. The location of these monitoring stations can be viewed on the SJVAPCD air monitoring webpage map of air monitoring sites in operation.[38]

The monitoring stations closest to the Project site are Fresno – Sierra Skypark #2; Fresno – Garland; and Fresno – First Street. Only one monitoring station in the SJVAPCD measures SO_2, so the Fresno station at First Street was used for this data. The most recent four years of published data at these monitoring stations are provided in **Table 2-3**. The frequency with which the ozone and PM standards have been exceeded at the nearest monitoring sites is displayed in **Table 2-4**.

[35] SJVAPCD. 2016 Ozone Plan for 2008 8-Hour Ozone Standard. Available at: https://www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016/Adopted-Plan.pdf. Accessed: February 2022.

[36] City of Fresno. 2014. Fresno General Plan. Available at: https://www.fresno.gov/darm/wp-content/uploads/sites/10/2019/07/ConsolidatedGP6182020.pdf. Accessed: July 2022.

[37] City of Fresno. 2014. General Plan and Development Code Update. Available at: https://www.fresno.gov/darm/wp-content/uploads/sites/10/2016/11/Sec-05-03-Air-Quality-MEIR.pdf. Accessed: July 2022.

[38] SJVAPCD. Air Monitoring. Available at: https://valleyair.org/aqinfo/air-monitoring.htm. Accessed: February 2022.

3. SIGNIFICANCE THRESHOLDS

3.1 California Environmental Quality Act Guidelines

The analysis provided in this report evaluates the significance of the Project's criteria air pollutant emissions by reference to the following questions from Section III, Air Quality, of Appendix G of the California Environmental Quality Act (CEQA) Guidelines[39]:

Threshold 1. Would the Project conflict with or obstruct implementation of the applicable air quality plan?

Threshold 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?

Threshold 3. Would the Project expose sensitive receptors to substantial pollutant concentrations?

Threshold 4. Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

An evaluation of the Project based on the significance thresholds discussed below is provided in subsequent sections.

3.2 San Joaquin Valley Air Pollution Control District Thresholds

The SJVAPCD has established significance thresholds[40] to assess the impacts of project-related construction and operational emissions on regional and local ambient air quality. **Table 3-1** shows the mass annual thresholds for construction and operation as adopted by the SJVAPCD for CAP and TAC emissions. As shown in **Table 3-1**, the SJVAPCD has separate operational emissions thresholds for permitted equipment and activities and non-permitted equipment and activities. Permitted equipment and activities are those which require a permit through SJVAPCD. Non-permitted equipment and activities do not require a permit and include area, energy, and mobile sources. The analysis summarized in this report estimates project-related construction and operational mass emissions and compares the emissions to these significance thresholds.

The thresholds represent screening-level thresholds that can be used to evaluate whether project-related emissions would cause a significant impact on air quality. For pollutants in attainment, emissions below the screening-level thresholds would not cause a significant impact. When assessing the significance of project-related impacts on air quality, impacts may be significant when on-site emission increases from construction activities or operational activities exceed the 100 pounds per day screening level of any criteria pollutant after implementation of all enforceable mitigation measures.[41] Under such circumstance, SJVAPCD recommends that an ambient air quality analysis be performed. In the event that emissions exceed these daily thresholds, modeling would be required to demonstrate that

[39] California Natural Resources Agency. 2018. Appendix G of the CEQA Guidelines. Available at: http://resources.ca.gov/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf. Accessed: February 2022.

[40] SJVAPCD. 2015. Air Quality Thresholds of Significance – Criteria Pollutants. March 19. Available at: http://www.valleyair.org/transportation/0714-gamaqi-criteria-pollutant-thresholds-of-significance.pdf. Accessed: February 2022.

[41] SJVAPCD. 2015. GAMAQI. Available at: http://www.valleyair.org/transportation/GAMAQI.pdf. Accessed: July 2022.

the project's total air quality impacts result in ground-level concentrations that are below the CAAQS and NAAQS, including appropriate background levels.

3.3 Project Approach to Significance

This report, relative to threshold 1, evaluates the Project for consistency with applicable plans related to emissions, including the regional air quality attainment plans. This report, relative to threshold 2, quantifies the Project's emissions during construction and operations and compares those results to the applicable SJVAPCD thresholds. Relative to threshold 3, this report includes a CO hotspots analysis and summarizes results of the Health Risk Assessment Technical Report which assesses the potential health risk impacts to sensitive receptors. This report, relative to threshold 4, evaluates the potential for odor-generating activities from the Project.

4. AIR QUALITY EMISSIONS INVENTORY

This section describes the methodology that Ramboll used to develop the criteria air pollutant emission inventories associated with the Project, which include one-time emissions associated with construction of the Project, and annual emissions associated with operation of the Project. Construction is expected to occur in mid- to late-2023. Emissions due to operation of the Project are therefore quantified for 2023. This is a conservative assumption for on-road and off-road mobile sources as vehicular emissions are expected to decrease in future years due to anticipated Statewide improvements and fleet turnover to newer equipment and vehicles. Sub-categories of operational emissions include the following: area, energy, mobile, and gasoline dispensing facility (GDF) sources. The emissions inventory reflects the reasonably foreseeable change based on the discontinued operation of the Costco Warehouse located at 4500 W Shaw Avenue. For purposes of this analysis, 4500 W Shaw Avenue is assumed to be backfilled by a shopping center use.

4.1 Resources

4.1.1 California Emission Estimator Model®

Ramboll primarily utilized the California Emissions Estimator Model (CalEEMod®) version 2020.4.0[42] methodology to assist in quantifying the criteria air pollutant emissions in the inventories presented in this report for the proposed project. CalEEMod® provides methodologies to calculate both construction emissions and operational emissions from a land use development project. It calculates daily or annual criteria air pollutant emissions. Specifically, the model methodology aids the user in the following calculations:

- One-time short-term construction emissions associated with site preparation, grading, building, and paving from off-road construction equipment, and on-road mobile equipment associated with workers, vendors, and hauling.
- Operational emissions associated with the fully built out project, such as on-road mobile vehicle traffic generated by the land uses, emissions from architectural coating, and emissions from consumer products.

CalEEMod® is a statewide program designed to calculate both criteria pollutant and GHG emissions from development projects in California developed under the auspices of the SCAQMD, with input from other California air districts, and is currently supported by numerous lead agencies for use in quantifying the emissions associated with development projects undergoing environmental review. CalEEMod® utilizes widely accepted models for emission estimates combined with appropriate default data that can be used if site-specific information is not available. These models and default estimates use sources such as the USEPA AP-42 emission factors,[43] CARB's on-road and off-road equipment emission models such as the EMission FACtor model (EMFAC) and the Emissions Inventory Program model

[42] SCAQMD. 2020. California Emissions Estimator Model®. Available at: https://www.aqmd.gov/caleemod. Accessed: February 2022.

[43] The USEPA maintains a compilation of Air Pollutant Emission Factors and process information for several air pollution source categories. The data is based on source test data, material balance studies, and engineering estimates. Available at: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors. Accessed: February 2022.

(OFFROAD), and studies commissioned by California agencies such as the California Energy Commission (CEC) and CalRecycle.

As mentioned above, CalEEMod® is based upon the CARB-approved OFFROAD and EMFAC models. OFFROAD[44] is an emission factor model used to calculate emission rates from off-road mobile sources (e.g., construction equipment, agricultural equipment). The off-road diesel emission factors used by CalEEMod® are based on the CARB OFFROAD2011 program. EMFAC2017[45] is the emission factor model used in CalEEMod® to calculate emissions rates from on-road vehicles (e.g., passenger vehicles). EMFAC2017 has been superseded by EMFAC2021. In order to allow for a more accurate representation of mobile source operational emissions associated with the Project, operational mobile source emission factors were estimated using EMFAC2021. These emissions factors were then used to estimate mobile source operational emissions based on CalEEMod® methodology and defaults along with Project specific values where available.

In addition, CalEEMod® contains default values and existing regulation methodologies to use in each specific local air district region. Appropriate statewide default values can be utilized if regional default values are not defined. Ramboll used default factors for the Fresno County area for the emissions inventory, unless otherwise noted in the methodology descriptions below.

4.2 Construction Emissions

This section describes the calculation of criteria air pollutant emissions from construction activities at the Project site. While the exact construction schedule and equipment mix may vary from the current analysis, the emissions are not expected to be higher than that calculated given the conservative assumptions included in the analysis.

The major construction phases included in this analysis are:

- Demolition: involves removing buildings or structures.
- Site Preparation: involves clearing vegetation (grubbing and tree/stump removal) and removing stones and other unwanted material or debris prior to grading.
- Grading: involves the cut and fill of land to ensure the proper base and slope for the construction foundation.
- Paving: involves the laying of concrete or asphalt such as in parking lots or roads.
- Building Construction: involves the construction of structures and buildings.
- Architectural Coating: involves parking and lane striping

The proposed schedule for constructing the Project is shown in **Table 4-1**. Construction-related emissions of ROGs, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$ were estimated using CalEEMod®. PM emissions are composed of exhaust emissions and fugitive emissions. Exhaust emissions are typically given out by a combustion engine of on-road vehicles and/or off-road equipment. Fugitive emissions are PM dust suspended in the air by wind action and

[44] CARB. 2011. Off Road Mobile Source Emission factors. Available at: https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory. Accessed: February 2022.

[45] CARB. 2015. Mobile Source Emissions Inventory. Available at: https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-modeling-tools. Accessed: February 2022.

construction related activities. Default on-site equipment lists in CalEEMod® supplemented with Project-specific material movement inputs were used for the various construction phases.

4.2.1 Emissions from Construction Equipment

The emission calculations associated with construction equipment are from off-road equipment engine use based on the equipment list and phase length, and on-road vehicle trips and phase length.

Since the majority of the off-road construction equipment used for construction projects are diesel fueled, CalEEMod® methodology assumes all of the equipment operates on diesel fuel. The calculations include the running exhaust emissions from off-road equipment. Since the equipment is assumed to be diesel, there are no starting emissions associated with the equipment, as these are *de minimis* for diesel-fueled equipment. CalEEMod® calculates the exhaust emissions based on default values for horsepower and load factor from CARB's OFFROAD2011.[46]

Project construction would include on-site equipment during grading/excavation and site preparation that generates fugitive dust. The construction-related equipment mix assumptions are project-specific. See **Table 4-2** for the construction equipment by construction phase. The combustion emissions from this equipment were calculated using CalEEMod®; the fugitive dust emissions from this equipment were calculated using the quantity of material moved and AP-42 emissions factors. PM_{10} and $PM_{2.5}$ emissions from fugitive dust will be controlled by watering consistent with Regulation VIII (Rules 8011 through 8081). For purposes of this analysis, CalEEMod® defaults assume watering the construction site twice a day reduces the fugitive dust emissions by 55%. Additionally, construction equipment greater than 50 hp used at the site shall meet USEPA Tier 3 emission standards for PM_{10} and $PM_{2.5}$ and include particulate matter emissions control equivalent to CARB Level 3 verifiable diesel emission control devices.

4.2.2 Emissions from On-Road Construction Trips

Construction generates on-road vehicle criteria air pollutant emissions from personal vehicles for worker and vendor commuting.

These emissions are calculated in CalEEMod® based on the number of trips and vehicle miles traveled (VMT) along with emission factors from EMFAC2017. The numbers of worker and vendor trips represent defaults from CalEEMod® based on the construction equipment to be used. The number of haul trips was estimated based on the volume of soil to be imported/exported (**Table 4-3**) and the square footage to be demolished (**Table 4-4**).

4.2.3 Fugitive Dust

Fugitive dust contributes to PM_{10} and $PM_{2.5}$ emissions and is generated by the various construction activities occurring at the Project site including entrained road dust, grading, demolition, and truck loading.

Entrained road dust is generated by vehicle travel on paved and unpaved roads. Emission factors for entrained road dust are on a "per mile" basis. In CalEEMod®, entrained road dust emission factors are based on the equations presented in the Paved Roads and Unpaved

[46] SCAQMD. 2020. California Emissions Estimator Model® User's Guide, Appendix A. Available at: https://www.aqmd.gov/caleemod. Accessed: February 2022.

Roads chapters of USEPA's AP-42 and are then multiplied by the total VMT for Project-related trips. Emissions from entrained road dust were estimated using CalEEMod® and are presented in **Appendix A**.

Fugitive dust emissions from bulldozing equipment (i.e., rubber-tired dozers), grading equipment (i.e., graders, rubber-tired dozers, and scrapers), and demolition activity occur during the Project construction. In addition, truck loading activities would generate fugitive dust emissions. The construction material movement and demolition assumptions are presented in **Table 4-3** and **Table 4-4**, respectively. Emissions from these sources were estimated using CalEEMod® and are presented in **Appendix A**.

4.2.4 Architectural Coating

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings. CalEEMod® was used to estimate VOC evaporative emissions from application of surface coatings and these emissions are presented in **Appendix A**.

4.2.5 Paving

CalEEMod® was used to estimate the VOC off-gassing emissions associated with asphalt paving. The emissions associated with paving are presented in **Appendix A**.

4.2.6 Total Construction Emissions

The annual and daily criteria air pollutant emissions associated with construction are shown in **Table 4-5**. As shown in **Table 4-5**, annual and daily criteria air pollutant emissions from construction of the Project are below the SJVAPCD significance thresholds.

4.3 Operational Emissions

This section describes the calculation of criteria air pollutant emissions from Project operational activities. Operational emissions are evaluated for the first year of Project operation in 2023.

4.3.1 Area Sources

Area sources are those emissions that are generally too small to be uniquely identified as point sources and are thus generally aggregated as a group. CalEEMod® estimates emissions for the following sources, which are included under the category of "area" sources: landscaping equipment (e.g., lawn mowers), consumer products, and architectural coatings. Criteria air pollutant emissions due to natural gas combustion in buildings, could also be considered area sources, but are reported by CalEEMod® in the emissions associated with building energy use (described below).

The criteria air pollutant emissions generated by the Project were calculated using CalEEMod® defaults and can be viewed in **Appendix A**.

4.3.2 Energy Sources

Criteria air pollutant emissions are emitted from buildings as a result of activities for which natural gas is typically used as an energy source. Combustion of fossil fuels, such as natural gas, emits criteria air pollutants directly into the atmosphere. Climate Zone 11 was selected based on the CEC forecast climate zone map shown in the CalEEMod® User's Guide. The analysis assumes that the Project's land uses accord to the 2019 Title 24 Standards, as that code cycle became effective on January 1, 2020. To calculate the total building natural gas input for the Project, Ramboll utilized default values provided in CalEEMod®, which are based on the Commercial End-Use Survey (CEUS).

Criteria air pollutant emissions from the natural gas consumption were estimated in CalEEMod® and can be viewed in **Appendix A**.

4.3.3 Operational Gasoline Transfer and Dispensing

Emissions from gasoline transfer and dispensing mainly occur during loading, breathing, refueling, spillage, and from hose permeation. Emission factors were obtained from SJVAPCD staff for EVR Phase I and EVR Phase II installed underground tank. These emissions which are permitted through the SJVAPCD are presented in **Table 4-6**.

4.3.4 Mobile Sources

The criteria air pollutant emissions associated with on-road mobile sources are generated from customers and delivery trucks travelling to and from the Project site. The emissions associated with on-road mobile sources include running, idling and starting exhaust emissions, evaporative emissions, tire wear, brake wear, and entrained road dust. Running emissions are dependent on VMT. Starting and evaporative emissions are associated with the number of starts or time between vehicle uses and the assumptions used in determining these values are described below. In addition, a portion of warehouse delivery trucks will be equipped with transportation refrigeration units (TRUs), which result in emissions when the warehouse delivery truck is docked at the site. Ramboll calculated mobile source emissions using the trip rates and trip length information based on analyses conducted by Kittelson & Associates, Inc (Kittelson).

The analysis includes the reductions from adopted regulatory programs, which are accounted for within the EMFAC2021 model:

- AB 1493 ("the Pavley Standard") required CARB to adopt regulations by January 1, 2005, to reduce GHG emissions from non-commercial passenger vehicles and light-duty trucks of model year 2009 and thereafter. CalEEMod® and EMFAC2021 include emission reductions for non-commercial passenger vehicles and light-duty trucks of model year 2017 – 2025.
- The ACC program, introduced in 2012, combines the control of smog, soot causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2015 through 2025. CalEEMod® and EMFAC2021 include reductions associated with this regulation that are represented in this analysis. While ACC focuses on the reduction of GHG emissions, it is anticipated that this regulation would also help reduce criteria air pollutants.
- The USEPA/NHTSA advanced fuel economy and GHG standards (Phase 1) were adopted in 2011 for medium and heavy-duty trucks for model years 2014-2018.[47] This Heavy-Duty National Program is intended to reduce fuel use and GHG emissions from medium- and heavy-duty vehicles, semi-trucks, pickup trucks and vans, and all types and sizes of work trucks and buses in between. CalEEMod® and EMFAC2021 include reductions associated with this regulation that are represented in this analysis.

[47] USEPA, Office of Transportation and Air Quality. 2011. Available at: https://www.gpo.gov/fdsys/pkg/FR-2011-09-15/pdf/2011-20740.pdf. Accessed: February 2022.

- The USEPA/NHTSA advanced fuel economy and GHG standards (Phase 2) were adopted in 2016 for medium- and heavy-duty trucks for model years 2018 and beyond.[48] The Phase 2 program includes technology-advancing standards that substantially reduce GHG and criteria pollutant emissions and fuel consumption resulting in an ambitious, yet achievable, program that will allow manufacturers to meet the applicable standards over time, at reasonable cost, through a mix of different technologies. The Phase 2 program's standards will be phased in, beginning with model year 2021 and culminating with model year 2027. [49]

In November 2019, CARB released EMFAC off-model adjustment factors to account for the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One.[50] The SAFE Rule has been incorporated into EMFAC2021, which is used in this analysis.

4.3.4.1 Calculating Mobile Source Emissions

Mobile source emissions calculation requires trip rates and trip lengths for each different trip type in the Project (e.g., passenger vehicles and delivery trucks).

The following sections describe the methodology to derive the necessary inputs. The mobile source calculations were performed using Excel following CalEEMod® methodology in order to capture the Project's mobile emissions.

The Project emissions inventory accounts for the moving of the Costco Warehouse from 4500 W Shaw Avenue to the new Project location (i.e., W. Herndon Avenue and N. Riverside Drive). It is reasonably foreseeable that the 4500 W Shaw Avenue location will be backfilled with a shopping center use, which will have lower mobile emissions compared to the current Costco Warehouse operations. The reduction in mobile emissions from the removal of the Costco Warehouse at 4500 W Shaw Avenue is incorporated into the Project emissions inventory. The VMT and trip rate assumed for the change at 4500 W Shaw Avenue and Project location are detailed in **Appendix B**.

a) Trip Generation Rates

The trip generation rates for the Project were based on Kittelson data. The trips for the northeast corner of W. Herndon Ave. and N. Riverside Dr (Herndon/Riverside) and 4500 W Shaw Ave are shown in **Appendix B** in **Table B-1a** and **Table B-1b**, respectively.

b) Trip Lengths

Trip lengths for passenger vehicles, fuel delivery trucks, and warehouse delivery trucks were provided by Kittelson. The trip length for the MDO delivery trucks is based on the average routed round trip length for Fresno MDO deliveries. These trip lengths for Herndon/Riverside and 4500 W Shaw Ave are presented in **Appendix B, Table B-1a** and **Table B-1b**, respectively.

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[48] USEPA, Office of Transportation and Air Quality. 2016. Available at: https://www.gpo.gov/fdsys/pkg/FR-2016-10-25/pdf/2016-21203.pdf. Accessed: February 2022.

[49] The emission reductions attributable to Phase 2 of the regulations for medium- and heavy-duty trucks were not included in the Project's emissions inventory due to the difficulty in quantifying the reductions. Excluding these reductions results in a more conservative (i.e., higher) estimate of emissions for the Project.

[50] CARB. 2019. EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicles Rule Part One. Available at: https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf. Accessed: February 2022.

c) Fleet Mix

The fleet mixes derived based on CalEEMod® and EMFAC2021 were used to determine the mix of light-duty vehicles used for member vehicles and employee vehicles. The MDO delivery trucks, fuel delivery trucks, and warehouse delivery trucks were assumed to all be heavy-heavy-duty trucks. The fleet mixes were used to calculate the fleet-weighted average emission factor for each vehicle type. The fleet mixes for the operational mobile trips are shown in **Table B-2** of **Appendix B**.

d) Transportation Refrigeration Units

The Project includes Transport Refrigeration Units (TRUs), which are refrigeration systems powered by diesel internal combustion engines designed to refrigerate or heat perishable products that are transported in various containers, including truck vans, semi-truck trailers, shipping containers, and railcars. These TRUs account for approximately 15% of the warehouse delivery trucks. This analysis assumes that TRUs are plugged in at the loading dock. Emission factors for TRUs were obtained from OFFROAD2021 for TRU trailers in Fresno County and are presented in **Table 4-7**.

e) On-Road Mobile Source Emission Factors

Exhaust, evaporative, tire wear, and brake wear emission factors were obtained from EMFAC2021 for Fresno County and are presented in **Appendix B, Tables B-3 through B-5**. Emission factors for passenger vehicles were calculated as a fleet-weighted average. Entrained road dust emission factors were calculated following guidance in the CalEEMod® User's Guide, Appendix A, which is based on AP-42, Section 13.2.1 for vehicles traveling on paved roads. Entrained road dust emission factors for PM_{10} and $PM_{2.5}$ are shown in **Appendix B, Table B-6**.

4.3.4.2 Mobile Source Emissions

The emission factors for each vehicle type were calculated from EMFAC2021 model outputs. The fleet mixes from **Table B-2** were used to form member vehicle weighted emission factors and employee vehicle weighted emission factors. The emission factors used to estimate mobile emissions from running exhaust, running losses, tire wear, brake wear (**Table B-3**), and entrained road dust (**Table B-6**) are on a "per mile" basis and thus the emissions were calculated by multiplying these factors by the estimated VMT for each vehicle type. The emission factors for starting exhaust and non-running evaporative processes (**Table B-4**) are on a "per trip" basis and thus the emissions were calculated by multiplying these factors by the estimated number of trips for each vehicle type. The emission factors used to estimate criteria air pollutant emissions from idling (**Table B-5**) are on a "per minute of idling" basis and thus the emissions were calculated by multiplying these factors by the estimated idle duration for each vehicle type.

Member vehicles used the member vehicle weighted emission factors, while warehouse, fuel station, and car wash employees and MDO driver and warehouse employee vehicles used the employee vehicle weighted emission factors. The overall mobile source emissions are shown in **Appendix B, Table B-7a** and **B-7b.**

4.3.5 Total Operational Emissions

Table 4-8a summarizes the Project operational criteria air pollutant emissions from permitted and non-permitted sources on an annual basis. **Table 4-8b** summarizes the

Project operational on-site daily criteria air pollutant emissions from permitted and non-permitted sources.

5. HEALTH RISK ASSESSMENT

This HRA evaluates the estimated cancer risk, non-cancer chronic hazard index (HIC), and acute hazard index (HIA) associated with construction and operation of the Project to address the SJVACPD Significance Thresholds.

5.1 Estimated Air Concentrations

To evaluate the health risks and concentration of air toxics in the surrounding area, SJVAPCD recommends estimating concentrations using air pollution dispersion modeling. The methodologies used to evaluate emissions for the Project are based on the most recent SJVAPCD Modeling and Health Risk Assessment Guidelines and the most recent Air Toxics Hot Spots Program Risk Assessment Guidelines from Office of Environmental Health Hazard Assessment (OEHHA).[51,52,53]

Off-site air concentrations of TACs from Project emissions are estimated using the American Meteorological Society/Environmental Protection Agency regulatory air dispersion model (AERMOD). Details on the inputs and methodology used in the dispersion modeling are discussed further in the sections below.

5.1.1 Toxic Air Contaminant Emissions

Ramboll evaluated excess lifetime cancer risk and HIC for off-site receptors from Project construction emissions. In particular, the construction HRA assesses the lifetime cancer risk and HIC associated with DPM emissions from off-road diesel construction equipment and hauling and vendor trucks during construction of the Project. Diesel exhaust, a complex mixture that includes hundreds of individual constituents, is identified by the State of California as a known carcinogen.[54,55] Under California regulatory guidelines, DPM is used as a surrogate measure of exposure for the mixture of chemicals that make up diesel exhaust as a whole. We conservatively assumed that all PM_{10} from diesel fueled equipment and trucks is DPM. Gasoline vehicles were not included in the HRA per the direction from SJVAPCD.[56]

Additionally, Ramboll evaluated the lifetime cancer risk, HIC, and HIA analyses resulting from Project operation, which includes DPM emissions associated with Costco delivery trucks travel and idling, warehouse diesel delivery truck travel and idling, MDO diesel delivery truck travel and idling, and TAC emissions (e.g., benzene) from gasoline transfer and dispensing. Costco members' vehicles are assumed to be gasoline-fueled, hybrid, and electric vehicles. Therefore, TAC emissions associated with Costco members' vehicles are not included in the

[51] SJVAPCD. 2006. Guidance for Air Dispersion Modeling. August. Available at: https://www.valleyair.org/busind/pto/Tox_Resources/Modeling%20Guidance.pdf Accessed: February 2022.

[52] SJVAPCD. Health Risk Assessment Guidance Document for AB2588 and CEQA. Document provided by the SJVAPCD staff, Kyle Melching, via email dated August 4, 2021.

[53] Cal/EPA, OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. February. Available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed: February 2022.

[54] Cal/EPA, OEHHA. 1998. Findings of the Scientific Review Panel on The Report on Diesel Exhaust, as adopted at the Panel's April 22, 1998, meeting.

[55] Cal/EPA, OEHHA. 2018. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. May. Available at: https://www.arb.ca.gov/toxics/healthval/contable.pdf. Accessed: May 2021.

[56] Email communication with SJVAPCD staff, Diana Walker, on August 17, 2021.

operational HRA based on the direction from the District.[57] Detailed emission calculations for the construction and operational HRAs are presented in **Appendix C** and **Appendix D**.

5.1.2 Air Dispersion Modeling Methodology

Ramboll used AERMOD Version 21112 to estimate ambient air concentrations and evaluate the health risks of TACs at off-site receptors. [58,59] For each receptor location, the model generates air concentrations (or air dispersion factors if unit emissions [i.e., 1 g/s] were modeled) that result from emissions from multiple sources.

Air dispersion models such as AERMOD require a variety of inputs such as source parameters, meteorological data, topography information, and receptor parameters. When site-specific information was unknown, default parameter sets that are designed to produce conservative (i.e., overestimates of) air concentrations were used.

5.1.2.1 AERMOD

AERMOD has been approved for use by USEPA, CARB, and SJVAPCD, and incorporates multiple variables in its algorithms including:

- Meteorological data representative of surface and upper air conditions;
- Local terrain data to account for elevation changes; and
- Physical specification of emission sources including information such as:
  - Location;
  - Release height; and
  - Source dimensions.

Dispersion model averaging times are specified based on the averaging times of ambient air quality standards and the air quality significance thresholds established by the appropriate regulatory agencies. For the Project construction HRA, the PERIOD averaging time (average concentration for the 5-year meteorological data set) was used to calculate chronic (long-term) health effects. No acute non-cancer toxicity has been identified for DPM.[60] Thus, an acute HI from Project construction was not calculated.

For the Project operational HRA, the 1-hour averaging time was used to evaluate acute (short-term) effects and the PERIOD averaging time (average concentration for the 5-year meteorological data set) was used to calculate chronic (long-term) health effects.

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[57] Ibid.

[58] USEPA. 2021. User's Guide for the AMS/EPA Regulatory Model (AERMOD). August. Available at: https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_userguide.pdf. Accessed: February 2022.

[59] USEPA. 2017. Guideline on Air Quality Models (Revised). 40 Code of Federal Regulations, Part 51, Appendix W. Office of Air Quality Planning and Standards. January. Available at: https://www.epa.gov/scram/clean-air-act-permit-modeling-guidance. Accessed: February 2022.

[60] CARB. 2018. *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values*. August, https://www.arb.ca.gov/toxics/healthval/contable.pdf. Accessed: February 2022.

The following other options in AERMOD were selected for use in this analysis. The regulatory default option was selected based the SJVAPCD modeling recommendations,[61] which established the settings for variables such as rural modeling dispersion option, receptor heights, off-site receptor grid spacing, and emissions source parameters. The air dispersion model was run using a unit emission factor approach. The model output based on a unit emission factor approach was incorporated into a post-processing step with the calculated emission rates to estimate the air concentrations at each receptor.

5.1.2.2 Source Characterization

For the Project construction HRA, DPM emissions from haul trucks and vendor vehicles traveled on the roadway links within 0.25 miles of the site boundary were modeled using line-volume sources in the air dispersion model. Volume sources covering the planned construction areas were used to represent DPM exhaust emissions from the off-road equipment for the construction modeling. 20 meters-by-20 meters volume sources[62] are used to characterize construction off-road equipment with a release height of 5 meters, an initial lateral dimension of 2.3 (length of side/2.15), and an initial vertical dimension of 1.4 m. Modeled construction emission source locations are shown in **Figure 1**.

For the Project operational analysis, DPM emissions from mobile sources traveling on the roadway links within 0.25 miles of the site boundary were modeled as line-volume sources. Point sources were used to represent on-site idling for fuel delivery trucks, warehouse delivery trucks, and MDO delivery trucks, as well as transport refrigeration unit (TRU) emissions when in use by warehouse delivery trucks at the warehouse loading docks. The GDF emission sources were modeled as point sources (loading and breathing emissions) and volume sources (refueling, hose permeation, and spillage). Modeled operational emission source locations are shown in **Figure 2**. Detailed source parameters and their bases were provided in **Appendix E**.

5.1.2.3 Meteorology

SJVAPCD provides AERMOD model-ready meteorological data sets for use in air quality and risk impact analyses in the SJVAB. SJVAPCD's Fresno, CA (Station ID 93193) meteorological data set was selected based on that station's close geographic proximity to the Project. The SJVAPCD meteorological data set for January 1, 2013 to December 31, 2017 was used for the analysis.[63] The meteorological station location is presented in **Figure 3**.

5.1.2.4 Land Use

The land uses surrounding the Project alignment are primarily a mix of developed residential and commercial areas. AERMOD offers the option of using either rural or urban dispersion characteristics. Selection of rural or urban dispersion characteristics depends on the predominant land use within a three-kilometer radius of the site. SJVAPCD recommends that if 50% or more of the land use types within the three-kilometer radius is classified as heavy

[61] SJVAPCD. 2006. Guidance for Air Dispersion Modeling. Available at: http://www.valleyair.org/busind/pto/tox_resources/Modeling%20Guidance.pdf. Accessed: February 2022.

[62] The modeled volume is an approximate representation of the area where construction activity may occur. Slight changes to the exact boundary of the construction activity area are not anticipated to meaningfully alter the analysis findings.

[63] SJVAPCD. Meteorological Data. Available at: ftp://ftp2.valleyair.org/public/Modeling/Meteorological_Data. Accessed: February 2022.

industrial, light/moderate industrial, and/or commercial, then urban dispersion characteristics must be chosen for all Project emissions sources. Otherwise, the rural dispersion characteristics must be chosen.[64] Ramboll determined that less than 50% of the land use within the three-kilometer radius is classified as the urban land use types, and rural dispersion characteristics were therefore used for the Project.

Data specifying terrain elevations of sources and receptors are imported into the model. Elevations are based on National Elevation Datasets (NEDs) and consist of an array of regularly spaced points on a horizontal plane for which an elevation is specified. NED 1-arc second data used in this analysis were obtained from the United States Geologic Survey (USGS).[65]

5.1.2.5 Emission Rates

Emissions were modeled using the χ/Q ("chi over q") method, such that each source group has a unit emission rate (i.e., 1 gram per second [g/s]), and the model estimates dispersion factors (with units of [µg/m^3]/[g/s]). Actual emissions were multiplied by the dispersion factors to obtain concentrations.

For the Project construction analysis, emissions from all modeled construction sources including off-road construction equipment, off-site vendor vehicle travel, and off-site hauling vehicle travel – were assumed to occur between the hours of 7:00 AM and 10:00 PM and 6 days per week for the Project construction duration of one year.

For the Project operational analysis, warehouse delivery trucks and TRUs are expected to operate between 2AM and 1PM, 7 days per week. Emissions from gasoline refueling, hose permeation, and spillage were modeled from 6 AM to 10 PM based on the anticipated operating schedule of the gas station. Emissions from fuel delivery trucks, MDO delivery trucks, and gasoline tank loading and breathing loss were conservatively modeled 24 hours per day, 7 days per week.

5.1.2.6 Receptors

In order to evaluate health impacts to off-site receptors, nearby sensitive receptor populations were identified. SJVAPCD identifies the following as off-site sensitive receptors: schools, daycare facilities, hospitals, and adult/elderly care facilities.[66] The following receptors are included in the AERMOD modeling per SJVAPCD guidance:[67]

- 25 m x 25 m from the site boundary to 100 m from the site boundary;
- 50 m x 50 m from 100 m to 250 m from the site boundary;
- 100 m x 100 m from 250 m to 500 m from the site boundary;
- 250 m x 250 m from 500 m to 1,000 m from the site boundary;
- 500 m x 500 m from 1,000 m to 2,000 m from the site boundary;

[64] SJVAPCD. 2006. Guidance for Air Dispersion Modeling. Available at: http://www.valleyair.org/busind/pto/tox_resources/Modeling%20Guidance.pdf. Accessed: February 2022.

[65] USGS National Elevation Dataset. Available at: https://www.mrlc.gov/tools. Accessed: February 2022.

[66] SJVAPCD. 2006. Guidance for Air Dispersion Modeling. Available at: http://www.valleyair.org/busind/pto/tox_resources/Modeling%20Guidance.pdf. Accessed: February 2022.

[67] Ibid.

- Coarse Grid 100 m x 100 m from 200 m to ¼-mile from the Project;[68] and
- Discrete sensitive receptors.

Sensitive receptor locations within a 2,000 meter radius of the modeled site boundary[69] were procured from a third-party that identified these receptors.[70]

The locations of all receptors are illustrated on **Figure 4**. Receptor heights were assumed to be ground-level based on SJVAPCD guidance.[71]

5.2 Risk Characterization Methods

The Project construction and operational HRA's was conducted in accordance with SJVAPCD risk assessment guidelines.[72] These guidelines are based on OEHHA's 2015 Air Toxics Hot Spots Program Risk Assessment Guidelines.[73] The 2015 OEHHA Guidelines include various updates that are protective of human health, particularly related to estimating potential risks in infants, children, and other sensitive receptors. Lifetime cancer risk, HIC, and HIA were calculated at each receptor. TAC emissions and air dispersion results were input into HARP, version 21081, the OEHHA-recommended program for completing an HRA. Specific steps taken to complete the HRA, such as exposure assessment, dose-response, and risk characterization are described in more detail below.

5.3 Exposure Assessment

To calculate health impacts for comparison to SJVAPCD thresholds, this report assesses risk to residential, worker, and sensitive receptors. The exposure rate for the residential scenario is more conservative than those for other sensitive receptor types (i.e., school child, daycare child, and patients) as residents have the highest exposure frequency, exposure time, and exposure duration, thus for this analysis, sensitive receptors were evaluated using residential exposure assumptions.

Exposure Assumptions: The exposure duration, pathways, exposure analysis methods (e.g., OEHHA 95th High End Method) evaluated in the HRA used to estimate excess lifetime cancer risks for exposed populations were selected in accordance with risk assessment guidelines from OEHHA and SJVAPCD.[74,75] A deposition rate of 0.05 m/s was used for multipathway analysis. For construction HRA, we conservatively assume that exposure begins at birth (age 0), rather than at the third trimester due to higher overall intake of DPM.

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[68] Ibid.

[69] Ibid.

[70] EDR. 2021. EDR Offsite Receptor Report.

[71] SJVAPCD. 2006. Guidance for Air Dispersion Modeling. Available at: http://www.valleyair.org/busind/pto/tox_resources/Modeling%20Guidance.pdf. Accessed: January 2022.

[72] SJVAPCD. Health Risk Assessment Guidance Document for AB2588 and CEQA. Document provided by the SJVAPCD staff, Kyle Melching, via email dated August 4, 2021.

[73] Cal/EPA, OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. February. Available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed: February 2022.

[74] Cal/EPA, OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. February. Available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed: February 2022.

[75] SJVAPCD. 2006. Guidance for Air Dispersion Modeling. Available at: http://www.valleyair.org/busind/pto/tox_resources/Modeling%20Guidance.pdf. Accessed: February 2022.

Calculation of Intake: The dose estimated for each exposure pathway is a function of the concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, can be calculated as follows:

$$IF_{inh} = \frac{DBR * FAH * EF * ED * CF}{AT}$$

Where:

IF_{inh} = Intake Factor for Inhalation (m^3/kg-day)

DBR = Daily Breathing Rate (L/kg-day)

FAH = Frequency of time at Home (unitless)

EF = Exposure Frequency (days/year)

ED = Exposure Duration (years)

CF = Conversion Factor, 0.001 (m^3/L)

AT = Averaging Time (days)

The chemical intake or dose is estimated by multiplying the inhalation intake factor, IF_{inh}, by the chemical concentration in air, C_i. When coupled with the chemical concentration, this calculation is mathematically equivalent to the dose algorithm given in the current OEHHA Hot Spots guidance.[76]

5.3.1 Age Sensitivity Factors

As a conservative and health-protective measure, the estimated excess lifetime cancer risks for a resident will be adjusted using age sensitivity factors (ASFs) that account for an "anticipated special sensitivity to carcinogens" of infants and children as recommended in the OEHHA 2009 Technical Support Document and OEHHA 2015 Air Toxics Hot Spots Program Risk Assessment Guidelines.[77,78] Cancer risk estimates were weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor (i.e., an ASF of one, which is equivalent to no adjustment) is applied to ages 16 and older.

5.3.2 Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. For purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories – cancer and non-cancer endpoints. Toxicity values that are used to estimate the likelihood of adverse effects occurring in humans at

[76] Cal/EPA, OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Appendix D. February. Available at: https://oehha.ca.gov/media/downloads/crnr/2015gmappendices.pdf. Accessed: September 2021.

[77] Cal/EPA, OEHHA. 2009. Technical Support Document for Cancer Potency Factors: Methodologies for Derivation, Listing of Available Values, and Adjustment to Allow for Early Life Stage Exposures. May. Available online at: https://oehha.ca.gov/air/crnr/technical-support-document-cancer-potency-factors-2009. Accessed: September 2021.

[78] Cal/EPA, OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Appendix D: February. Available at: https://oehha.ca.gov/media/downloads/crnr/2015gmappendices.pdf. Accessed: September 2021.

different exposure levels are identified as part of the toxicity assessment component of a risk assessment. Toxicity factors in the latest HARP Health Database,[79] integrated into the HARP program, were used in this HRA. The HARP program contains the most up-to-date listing of available inhalation and oral cancer potency factors (CPFs), chronic inhalation and oral RELs, and acute RELs approved by California Environmental Protection Agency (Cal/EPA) for use in health risk assessments.

5.4 Risk Characterization

This section describes the methods used to estimate potential adverse effects associated with off-site exposures to chemicals emitted from the Project. The results of the HRA are presented in Section 5.5. HARP was used to estimate carcinogenic risks and non-cancer HIs associated with potential exposures to potential emissions from the Project's construction and operational emissions.

5.4.1 Estimation of Cancer Risks

Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical-specific cancer potency factor (CPF). For carcinogenic chemicals, both inhalation and non-inhalation pathways must be considered, using the CPFs in HARP. Total risk is the sum of risks attributable to each chemical considered by each pathway.

The equation used to calculate the potential excess lifetime cancer risk for the inhalation pathway is as follows:

$$Riskinh = Ci \; x \; CF \; x \; IFinh \; x \; CPFi \; x \; ASF$$

Where:

Riskinh = Cancer risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unitless)

Ci = Annual average air concentration for chemical (µg/m^3)

CF = Conversion factor (mg/µg)

IFinh = Intake factor for inhalation (m^3/kg-day)

CPFi = Cancer potency factor for chemical (mg chemical/kg body weight-day)$^{-1}$

ASF = Age sensitivity factor (unitless)

A similar equation, using oral dose and the oral CPF, is used to calculate risks from oral exposure. Oral cancer risks include dermal absorption, incidental ingestion of soil, and mother's milk. HARP default exposure parameters were used, as described above.

[79] The latest HARP Health Database is available from ARB here: https://www.arb.ca.gov/toxics/harp/harp.htm. Accessed: February 2022.

5.4.1.1 Estimation of Chronic Non-Cancer Hazard Indices

The potential for exposure to result in adverse chronic non-cancer effects is evaluated by comparing the estimated annual average air concentration (which is equivalent to the average daily air concentration) to the non-cancer chronic reference exposure level (cREL) for each chemical. When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient (HQ). To evaluate the potential for adverse chronic non-cancer health effects from simultaneous exposure to multiple chemicals, the HQs for all chemicals are summed, yielding a HI:

$$HQi = Ci / cREL$$

$$HI = \sum HQ$$

Where:

HI	=	Hazard index
HQi	=	Chronic hazard quotient for chemical i
Ci	=	Annual average concentration of chemical i (µg/m^3)
cRELi	=	Chronic noncancer reference exposure level for chemical i (µg/m^3)

Estimation of non-inhalation chronic health effects uses a similar method, but the annual average air concentration is replaced by the dose calculated by HARP using the exposure parameters mentioned above, and the appropriate non-inhalation REL is used.

Estimation of an HI for each target organ (also referred to as a segregation of HI by target organ analysis) is recommended by OEHHA because the non-cancer effects of chemicals with different target organs are generally not additive.

5.5 Health Risk Results

Using the health risk assessment options for HARP detailed in **Table 5-1** and **Table 5-2** for the construction HRA and operational HRA, respectively, the potential health impacts during the construction and operation of the Project were estimated at the maximally impacted residential, worker, and sensitive receptors. The cancer risk, HIC, and HIA results of the construction and operational health risk assessment are presented in **Table 5-3**.

6. CO HOTSPOTS

Mobile-source impacts occur on two basic scales of motion. Regionally, Project-related travel will add to regional trip generation and increase the VMT within the local airshed and the SJVAB. Locally, Project traffic will be added to the City's roadway system. There is a potential for the formation of microscale CO "hotspots" in the area immediately around points of congested traffic. Because of continued improvement in mobile emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the basin is steadily decreasing.

Projects contributing to adverse traffic impacts may result in the formation of CO hotspots. To verify that the Project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO hotspots was conducted. The Fresno Costco Relocation Transportation Impact Analysis prepared by Kittelson evaluated the level of service (LOS) (i.e., increased congestion) impacts at intersections affected by the Project. The potential for CO hotspots was evaluated based on the results of the traffic analysis.

6.1 Regulatory Background

The City of Fresno's General Plan and Development Code Update was reviewed to determine if the Project would require a site-specific hotspot analysis. The localized impacts to ambient CO concentrations from peak traffic volumes within the City were modeled using the CALINE4 CO Hotspots model. It was determined that tripling the maximum traffic volume within the City during the peak hour – 12,000 trips – resulted in an 8-hour CO concentration of 6 ppm, which falls below the 8-hour CAAQS of 9.0 ppm.[80] Because that volume of traffic is very unlikely to occur, it was determined that CO hotspot modeling is not required for new projects unless roadway intersection traffic volumes exceed 36,000 peak hour trips.

Further, SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts indicates that the project would result in no potential to create a violation of the CO standard if neither of the following SJVAPCD screening criteria are met at any of the intersections affected by the project:[81]

- A traffic study for the project indicates that the LOS on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F.
- A traffic study indicates that the project will substantially worsen an already existing LOS F on one or more streets or at more or more intersections in the project vicinity.

[80] City of Fresno. 2014. General Plan and Development Code Update. Available at: https://www.fresno.gov/darm/wp-content/uploads/sites/10/2016/11/Sec-05-03-Air-Quality-MEIR.pdf. Accessed: February 2022.

[81] SJVAPCD. 2015. Guidance for Assessing and Mitigating Air Quality Impacts. Available at: http://www.valleyair.org/transportation/GAMAQI.pdf. Accessed: February 2022.

6.2 Traffic Study Findings

The Traffic Study[82] prepared for this project evaluated the LOS impacts at six existing intersections and three proposed intersections resulting from new roadways for site access. Kittelson evaluated eight scenarios, which are summarized in **Appendix G**:

- Scenario 1: Existing Conditions (2021),
- Scenario 2: Existing Plus Project Conditions (2021)
- Scenario 3: Existing Plus Project Conditions with Off-Site Improvements (2021)
- Scenario 4: Future Conditions (2042),
- Scenario 5: Future Plus Project Conditions (2042),
- Scenario 6: Future Plus Project with Reclassification Conditions with Off-Site Improvements (2042)
- Scenario 7: Future Plus Project Conditions without Reclassification of W. Herndon Ave. (2042), and
- Scenario 8: Future Plus Project Conditions without Reclassification of W. Herndon Ave. with Off-Site Improvements (2042).

Scenarios 3, 6, and 8 would not result in a reduction of LOS on one or more streets or at one or more intersections in the project vicinity to LOS E or F.

Based on the analysis performed by Kittelson, the LOS impacts show that the following intersections have the potential to reduce to LOS E or F with the Project:

- Scenario 2: Existing Plus Project Conditions (2021)
  - Intersection No. 2 (N Riverside Dr/W Fir Ave): PM and Saturday peak hours
  - Intersection No. 3 (N Riverside Dr/W Herndon Ave): AM, PM, and Saturday peak hours
  - Intersection No. 4 (N Golden State Blvd/W Herndon Ave): PM and Saturday peak hours
- Scenario 5: Future Plus Project Conditions (2042):
  - Intersection No. 2 (N Riverside Dr/W Fir Ave): PM and Saturday peak hours
  - Intersection No. 3 (N Riverside Dr/W Herndon Ave): AM, PM, and Saturday peak hours
  - Intersection No. 4 (N Golden State Blvd/W Herndon Ave): PM and Saturday peak hours
- Scenario 7: Future Plus Project Conditions without Reclassification of W. Herndon Ave. (2042)
  - Intersection No. 2 (N Riverside Dr/W Fir Ave): PM and Saturday peak hours
  - Intersection No. 3 (N Riverside Dr/W Herndon Ave): AM, PM, and Saturday peak hour
  - Intersection No. 4 (N Golden State Blvd/W Herndon Ave): PM and Saturday peak hours

For these intersections listed above, the total traffic volumes are less than the 36,000 vehicles per hour threshold determined in the General Plan. Further, the Project satisfies the remaining SJVAPCD screening criterion because there are no existing LOS F on any of the

[82] Kittelson & Associates, Inc. 2023. Fresno Costco Relocation Transportation Impact Analysis. May.

studied intersections. Therefore, the Project would not result in the potential to create a violation of the CO standard.

7. PROJECT INVENTORY IN CONTEXT

This section assesses the significance of the Project's emissions for purposes of CEQA.

7.1 Threshold 1

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

CARB has developed a three-step approach to determine project conformity with the applicable Air Quality Attainment Plan (AQAP):

1. *Determination that an AQAP is being implemented in the area where the project is being proposed.* SJVAPCD has implemented the current, modified 2016 8-hour AQAP as approved by CARB and approved by USEPA for the 2008 8-hour O3 standard.
2. *The proposed project must be consistent with the growth assumptions of the applicable AQAP.* The Fresno County 2050 growth Projections[83] for the 2018 Public Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)[84,85] provides for future employment/population factors.
3. *The project must contain in its design all reasonably available and feasible air quality control measures.* The Project incorporates various policy and rule-required implementation measures that would reduce related emissions.

As discussed in **Section 2.3**, SJVAPCD's air quality plans rely on information from CARB and Fresno Council of Governments (Fresno COG) to project future emissions and determine the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and Fresno COG growth projections are based on population, vehicle trends, and land use plans developed by the cities and Fresno County as part of the development of their general plans. As such, projects that propose development that is consistent with the growth anticipated by the general plan(s) would be consistent with the growth projections of the SIP because associated emissions of criteria pollutants in a designated non-attainment area would be accounted for in these air quality plans. If a project proposes development that is greater than anticipated in Fresno COG's growth projections, the project would be in conflict with the regional air quality attainment plans and SIP and could potentially result in a significant air quality impact.

The Project is expected to serve the existing population of the area by providing more convenient access to Costco services, and thus it is not expected to lead to population growth. Therefore, it is consistent with the growth projections developed by Fresno COG for the area. The Project also does not involve a change in land use type that would conflict with that established in the City of Fresno General Plan.

The Project shows conformity with CARB's three step approach and the Project growth was anticipated by the Fresno COG RTP/SCS and incorporated into the AQAP. Implementation of

[83] Fresno County Council of Governments, 2017. Fresno County 2050 Growth Projections. Available at: https://2ave3l244ex63mgdyc1u2mfp-wpengine.netdna-ssl.com/wp-content/uploads/publications/RTP/2018_RTP/Fresno_COG_2050_Projections_Final_Report_050417.pdf. Accessed: February 2022.

[84] Fresno County Council of Governments, 2018. Fresno County 2018 Regional Transportation. Available at: https://www.fresnocog.org/project/regional-transportation-plan-rtp/. Accessed: February 2022.

[85] The 2022 RTP/SCS is in development and 70% complete, but the final adoption is not planned until June 2022.

rule-required measures would ensure that the Project would not obstruct an air quality plan during construction or operation.

7.2 Threshold 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?

Per **Table 2-2**, the Project region is a designated non-attainment area for ozone (the State 1-hour O_3; federal and State 8-hour O_3) and particulate matter (State PM_{10}; federal and State $PM_{2.5}$). Ozone precursors include VOC and NO_X. As discussed in **Section 4**, estimated emissions for the Project show that the annual emissions for construction (**Table 4-5**) and on-site operations (**Table 4-8a** and **Table 4-8b**) are less than the SJVAPCD significance thresholds for all criteria pollutants. For annual operational criteria air pollutant emissions, the NOx and PM_{10} are above the SJVAPCD significance thresholds prior to compliance with Rule 9510. Through compliance with Rule 9510, the operational PM_{10} and NOx emissions would be below the significance thresholds.

7.3 Threshold 3

Would the Project expose sensitive receptors to substantial pollutant concentrations?

7.3.1 Health Risk Thresholds

The construction-related and operational health risk assessment results were used to assess if the Project would expose off-site receptors to substantial pollutant concentrations. As discussed in **Section 5**, the construction analysis evaluates the health risk resulting from off-road equipment DPM emissions during construction of the Project, as well as the DPM emissions from hauling and vendor trucks. The operational analysis evaluates the health risk resulting from DPM emissions from TRU usage, travel and idling for fuel delivery trucks, warehouse delivery trucks, and MDO delivery trucks, as well as TAC emissions from gasoline transfer and dispensing.

The results of the analyses show that the lifetime cancer risk, HIC, and acute hazard index of the Project-related construction and operational emissions are less than the SJVAPCD significance thresholds (**Table 5-3**).

7.3.2 CO Hotspots

Per **Section 6**, the Project would not result in a CO "hot spot" and a CO "hot spots" analysis is not needed to determine whether the change in the level of service (LOS) of an intersection in the Project area would have the potential to result in exceedances of the CAAQS or NAAQS or expose sensitive receptors to substantial pollutant concentrations.

7.3.3 Health Effects of Criteria Air Pollutants

Significant project criteria air pollutant emissions could potentially lead to increased concentrations of pollutants in the atmosphere and could result in health effects due to the increased emissions. The following section describes the mechanism by which project-related emissions could increase the concentrations of criteria air pollutants in the atmosphere and qualitatively describes the potential health effects.

The ambient concentration of criteria pollutants is a result of complex atmospheric chemistry and emissions of pollutant precursors and direct emissions. NO_X and VOC are precursors to ozone and, and NOx, VOC, and SO_X are precursors to secondarily formed $PM_{2.5}$. Chemical and

physical processes transform some of these precursors to the criteria pollutant concentrations in the atmosphere. The calculation of ozone and secondary $PM_{2.5}$ concentrations resulting from precursors is dependent on the spatial location of the criteria air pollutant emissions and how the emissions are dispersed in the atmosphere. Source apportionment, or the practice of deriving information about pollution sources and the amount they contribute to ambient air pollution levels, is also influenced by the meteorological conditions of the project location.

There are several variables which determine whether emissions of air pollutants from the project move and disperse in the atmosphere in a manner in which concentrations of criteria pollutants would become elevated and result in health impacts. A specific mass of precursor emissions does not equate to an equivalent concentration of the resultant ozone or secondary particulate matter in that area. The resulting concentration of criteria pollutants is influenced by sunlight, other pollutants in the air, complex reactions, and transport. The dispersion is based on the meteorological conditions of the source (the project), local terrain (elevation profile), and the height and size of the source. The surrounding land use, wind direction and wind speed will influence the location where the project emissions disperse. Meteorology, the presence of sunlight, and other complex chemical factors all combine to determine the ultimate concentration and location of ozone or PM formed by emissions of precursors.

The resulting health effects are further based on a complex relationship of multiple variables and factors. The calculated health effects are dependent upon the concentrations of pollutants to which the receptors are exposed, the number and type of exposure pathways for a receptor, and the intake parameters for a receptor, which vary based upon age and sensitivity (i.e. presence of pre-existing conditions). Health effects would be more likely for individuals with greater susceptibility to exposures, and also dependent on the location of receptors relative to the project site impacts whether receptors are exposed to project-related pollutants.

The following is a summary of the health effects from ozone, $PM_{2.5}$ and PM_{10}. Meteorology and terrain play major roles in ozone formation, and ideal conditions occur on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. Short-term exposures (lasting for a few hours) to ozone at levels typically observed in California can result in health effects. When inhaled, $PM_{2.5}$ and PM_{10} can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks and cause or aggravate bronchitis and other lung diseases. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissues. Health effects of $PM_{2.5}$ include mortality (all causes), hospital admissions (respiratory, asthma, cardiovascular), emergency room visits (asthma), and acute myocardial infarction (non-fatal). For ozone, the endpoints are mortality, emergency room visits (respiratory) and hospital admissions (respiratory).

For this project, mass emissions for construction are below significance levels. For operation, emissions are also below significance levels for on-site daily emissions. Annual operational emissions are above the significance thresholds for NOx and PM_{10} prior to rule compliance and reduced to below the annual thresholds after rule compliance. The health effects from these emissions have been addressed by the analyses included herein.

The SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts establishes thresholds which are based upon scientific data that demonstrate the level of criteria air pollutant emissions that can be accommodated in the San Joaquin Valley without affecting the attainment of the CAAQS and NAAQS. As discussed in **Section 2.3.1**, the CAAQS and NAAQS are set to protect the public health and welfare from the effects of air pollution. Thus, the analyses relative to the SJVAPCD significance thresholds are an indicator for the potential health effects. The District has also adopted health risk thresholds that provide a threshold regarding the potential health effects for air pollutants. The GAMAQI states that "the District has established thresholds of significance for TACs that are extremely conservative and protective of health impacts on sensitive receptors." The CO hotspots analysis further evaluates for health effects based on the CAAQS for CO. The evaluation of the air emissions, which is a measure of potential health effects, are highlighted in **Section 7.1** through **7.3.2**.

7.4 Threshold 4

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

7.4.1 Odors

According to SJVAPCD's *Guidance for Assessing and Mitigating Air Quality Impacts*, each project that will generate odors should be evaluated to determine the likelihood that it would result in nuisance odors. SJVAPCD recognizes the subjective nature of odor impacts and recommends that each project should be assessed on a "case-by-case" basis, taking into consideration all available pertinent information to qualitatively determine if a significant impact is likely to occur, such as information regarding the characteristics of the buffer zone between the sensitive receptor(s) and the odor source(s), local meteorological conditions, and the nature of the odor source. To facilitate the evaluation of odors, SJVAPCD has produced a list of common types of facilities, along with the distance from the source within which odors could possibly be significant. The list provides a qualitative assessment of a project's potential to adversely affect off-site receptors. The table below presents the list of common facilities and the minimum distance from the source below which the odor impacts may be significant. The Project does not include any uses identified by the SJVAPCD as being associated with odors, and thus the Project would not result in odors adversely affecting a substantial number of people.

SJVAPCD Screening Levels for Potential Odor Sources	
Type of Facility	**Distance**
Wastewater Treatment Facility	2 Miles
Sanitary Landfill	1 Mile
Transfer Station	1 Mile
Composting Facility	1 Mile
Petroleum Refinery	2 Miles
Asphalt Batch Plant	1 Mile
Chemical Manufacturing	1 Mile
Fiberglass Manufacturing	1 Mile

SJVAPCD Screening Levels for Potential Odor Sources	
Type of Facility	**Distance**
Painting/Coating Operations	1 Mile
Food Processing Facility	1 Mile
Feed Lot/Dairy	1 Mile
Rendering Plant	1 Mile

7.4.2 Valley Fever

7.4.2.1 Background

Valley Fever or *coccidioidomycosis* is one of the most studied and oldest known fungal infections. *Coccidioidomycosis* was first discovered in the early 1890s in Domingo Ezcurra, an Argentinean soldier, and in 1900 was established as a fungal disease. After an outbreak in the 1930s in the San Joaquin Valley of California, this disease was given its nickname "San Joaquin Valley Fever," often shortened further to "Valley Fever".[86]

Valley Fever is primarily a disease of the lungs caused by inhalation of spores of the *Coccidioides immitis* fungus. The *Coccidioides* fungus resides in the soil in southwestern United States, northern Mexico, and parts of Central and South America. When weather and moisture conditions are favorable, the fungus "blooms" and forms many tiny spores that lie dormant in the soil. The spores are found in the top few inches of soil, become airborne when the soil is disturbed by wind, vehicles, excavation, or other ground-moving activities, and are subsequently inhaled into the lungs. After the fungal spores have settled in the lungs, they change into a multicellular structure called a spherule. Fungal growth in the lungs occurs as the spherule grows and bursts, releasing endospores, which then develop into more spherules.

Infection occurs when the spores of the fungus become airborne and are inhaled. The fungal spores become airborne when contaminated soil is disturbed by human activities, such as construction and agricultural activities, and natural phenomenon, such as windstorms, dust storms, and earthquakes.

Valley Fever symptoms generally occur within 2-3 weeks of exposure. Approximately 60% of Valley Fever cases are mild and display flu-like symptoms or no symptoms. The remainder developed flu-like symptoms (fatigue, cough, chest pain, fever, rash, headache, and joint aches) that can last for a month and tiredness that can sometimes last for longer than a few weeks. In some cases, painful red bumps may develop. A small percentage of infected persons (<1%) can develop disseminated disease that spreads outside the lungs to the brain, bone, and skin. Without proper treatment, Valley Fever can lead to severe pneumonia, meningitis, and even death. Symptoms may appear 1 to 4 weeks after exposure.

[86] Los Angeles County Department of Health Services. 2004. Coccidioidomycosis: Cases of Valley Fever on the Rise in Southern California. The Public's Health Newsletter for Medical Professionals in Los Angeles County, Volume 4, Number 3. April. Available at: http://www.publichealth.lacounty.gov/media/tph/TPHApril2004.pdf. Accessed: February 2022.

These symptoms are not unique to Valley Fever and may be caused by other illnesses as well. Identifying and confirming this disease requires specific laboratory tests such as: (1) microscopic identification of the fungal spherules in the infected tissue, sputum, or body fluid sample; (2) growing a culture of *Coccidioides immitis* from a tissue specimen, sputum, or body fluid; (3) detection of antibodies (serological tests specifically for Valley Fever) against the fungus in blood serum or other body fluids; and (4) administering the Valley Fever skin test (called coccidioidin or spherulin), which indicates prior exposure to the fungus

Valley Fever is not contagious, and thus cannot be passed from person to person. Most individuals who are infected will recover without treatment within 6 months and will have a life-long immunity to the fungal spores. In severe cases, such as patients with rapid and extensive primary illness, those who are at risk for dissemination of disease, and those who have disseminated disease, antifungal drug therapy is used. Only 1-2% of those exposed who seek medical attention will develop a disease that spreads to other parts of the body other than the lungs. The table below presents infection classifications and normal diagnostic spread as noted in recent research.

Range of Valley Fever Cases[87,88]

Infection Classification	Percent of Total Diagnosed Cases
Asymptomatic infections	60
Infections that resolve spontaneously (with lifelong immunity)	35
Chronic disease or disease disseminated throughout the body	Up to 5
Meningeal infection (affecting brain and/or spinal cord and requiring lifetime treatment)	0.15–0.75

Factors that affect the susceptibility to coccidioidal dissemination are race, sex, pregnancy, age, and immunosuppression. In 2019, there were 9,004 reported Valley Fever cases in California.[89] Consistent with previous years, the highest incidence of Valley fever in 2019 was reported in counties in the Central Valley and Central Coast regions of California, including Kern, Kings, San Luis Obispo, Fresno, Tulare, Madera, and Monterey counties. Of the 9,004 reported cases, 621 were reported for Fresno County.[90] Within Fresno County, elevated

[87] Hector RF, Laniado-Laborin R. 2005. Coccidioidomycosis—A Fungal Disease of the Americas. *PLoS Medicine*. 2005;2(1):e2. doi:10.1371/journal.pmed.0020002. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC545195. Accessed: February 2022.

[88] Saubolle, Michael A., Peter P. McKellar, and Den Sussland. 2007. Epidemiologic, clinical, and diagnostic aspects of coccidioidomycosis. *Journal of clinical microbiology* 45.1: 26-30. Available at: http://jcm.asm.org/content/45/1/26.short. Accessed: February 2022.

[89] California Department of Public Health. 2020. Valley Fever Cases Reach Record High in California in 2019. Available at: https://www.cdph.ca.gov/Programs/OPA/Pages/NR20-321.aspx. Accessed: February 2022.

[90] California Department of Public Health. 2020. Epidemiologic Summary of Valley Fever in California, 2019. https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary2019.pdf. Accessed: February 2022.

areas of Valley Fever activity are known in the western portion, which does not include the City of Fresno.[91]

7.4.2.2 Assessment of Valley Fever Risks

The *Coccidioides immitis* fungus spores found in soil, which are responsible for transmitting the Valley Fever, can disperse in the air when the soil is disturbed during construction activities, and then can be inhaled into the lungs. On-site construction workers potentially could be exposed to Valley Fever from fugitive dust generated during construction of the Project, notably during grading and other earthmoving activities. Construction activities are subject to SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibition). Regulation VIII is intended to reduce ambient concentrations of PM_{10} by requiring actions to prevent, reduce or mitigate anthropogenic fugitive dust emissions. By reducing fugitive dust emissions, Regulation VIII reduces potential exposure to Valley Fever. Since current long-term residents typically already have been exposed to and have developed immunity to Valley Fever, construction activities are not expected to add significantly to exposure of off-site residents to the fungus.

Operation of the Project is not expected to produce significant amounts of fugitive dust. Therefore, operational activities are not expected to add significantly to exposure of off-site residents to the fungus.

[91] Fresno County. Valley Fever in Fresno County. Available at: https://www.co.fresno.ca.us/home/showpublisheddocument/20584/636482356859800000. Accessed: February 2022.

TABLES

Table 2-1. Summary of NAAQS and CAAQS
Costco Commercial Center
Fresno, California

Pollutant	Averaging Time	California Standards[1]		National Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM_{10})[9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		-		
Fine Particulate Matter ($PM_{2.5}$)[9]	24 Hour	-	-	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15.0 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	-	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	-	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		-	-	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	-	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)		Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	-		-	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[11]	-	
	Annual Arithmetic Mean	-		0.030 ppm (for certain areas)[11]	-	
Lead (Pb)[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	-	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Calendar Quarter	-		1.5 µg/m^3 (for certain areas)[12]		
	Rolling 3-Month Average	-		0.15 µg/m^3		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Notes:

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

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

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Methods specified by the ARB or any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[7] Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

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

Table 2-1. Summary of NAAQS and CAAQS
Costco Commercial Center
Fresno, California

[9] On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM10 standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[10] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[11] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[12] The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[13] The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[14] In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Abbreviations:

ARB - Air Resources Board
CAAQS - California Ambient Air Quality Standards
CO - carbon monoxide
lbs - pounds
mg/m^3 - milligrams per cubic meter
NAAQS - National Ambient Air Quality Standards
NO_x - nitrogen oxide compounds (NO + NO_2)
ppm - parts per million
PM_{10} - particulate matter less than 10 microns in diameter
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
ROG - reactive organic gases
SO_x - sulfur oxide compounds
U.S. EPA - United States Environmental Protection Agency
µg/m^3 - micrograms per cubic meter
VOC - volatile organic compounds

Table 2-2. SJVAPCD NAAQS and CAAQS Attainment Status
Costco Commercial Center
Fresno, California

Pollutant	Designation/Classification[1]	
	Federal Standards[2]	California Standards[3]
Ozone (1 Hour)	No Federal Standard[4]	Nonattainment/Severe
Ozone (8 Hour)	Nonattainment/Extreme[5]	Nonattainment
Respirable Particulate Matter (PM_{10})	Attainment[6]	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment[7]	Nonattainment
Carbon Monoxide (CO)	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO_2)	Attainment/Unclassified	Attainment
Sulfur Dioxide (SO_2)	Attainment/Unclassified	Attainment
Lead (Particulate)	No Designation/Classification	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

Notes:

[1] See SJVAPCD Attainment Status. Available at: https://www.valleyair.org/aqinfo/attainment.htm. Accessed: September 2021.

[2] See 40 CFR Part 81.

[3] See CCR Title 17 Sections 60200-60210.

[4] Effective June 15, 2005, the U.S. Environmental Protection Agency (EPA) revoked the federal 1-hour ozone standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

[5] Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

[6] On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM_{10} National Ambient Air Quality Standard (NAAQS) and approved the PM_{10} Maintenance Plan.

[7] The Valley is designated nonattainment for the 1997 $PM_{2.5}$ NAAQS. EPA designated the Valley as nonattainment for the 2006 $PM_{2.5}$ NAAQS on November 13, 2009 (effective December 14, 2009).

Abbreviations:

CAAQS - California Ambient Air Quality Standards
CCR - California Code of Regulations
CFR - Code of Federal Regulations
CO - carbon monoxide
EPA - U.S. Environmental Protection Agency
NAAQS - National Ambient Air Quality Standards
NO_2 - nitrogen dioxide
PM_{10} - particulate matter less than 10 microns in diameter
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
ROG - reactive organic gases
SJVAPCD - San Joaquin Valley Air Pollution Control District
SJVAB - San Joaquin Valley Air Basin
SO_x - sulfur oxide compounds

Table 2-3. Local Ambient Air Quality Data (Fresno County)
Costco Commercial Center
Fresno, California

Pollutant[1,2]	Averaging Time	2017	2018	2019	2020	Most Stringent Ambient Air Quality Standard[3]	Monitoring Station
Ozone	1 hour	0.128 ppm	0.100 ppm	0.097 ppm	0.116 ppm	0.09 ppm (State)	Fresno - Sierra Skypark #2
	8 hours	0.107 ppm	0.087 ppm	0.084 ppm	0.096 ppm	0.070 ppm (State/National)	
PM_{10}	24 hours	153.6 µg/m^3	136.2 µg/m^3	334.9 µg/m^3	283.7 µg/m^3	50 µg/m^3 (State)	Fresno - Garland
	Annual	39.4 µg/m^3	40.6 µg/m^3	35.9 µg/m^3	48.4 µg/m^3	20 µg/m^3 (State)	
$PM_{2.5}$	24 hours	86 µg/m^3	95.7 µg/m^3	51.3 µg/m^3	163.2 µg/m^3	35 µg/m^3 (National)	Fresno - Garland
	Annual	14.8 µg/m^3	16.2 µg/m^3	11.1 µg/m^3	163.2 µg/m^3	12 µg/m^3 (National)	
SO_2	1 hour	7.7 ppb	7.2 ppb	8.9 ppb	16.2 ppb	75 ppb (National)	Fresno - First Street
	24 hours	2.3 ppb	2.6 ppb	2.1 ppb	2.2 ppb	140 ppb (National)	
NO_2	1 hour	51 ppb	43 ppb	41 ppb	43 ppb	100 ppb (National)	Fresno - Sierra Skypark #2
	Annual	7.21 ppb	7.93 ppb	6.98 ppb	7.5 ppb	30 ppb (State)	
CO	1 hour	2.3 ppb	2.1 ppb	1.9 ppb	5 ppb	20 (State)	Fresno - First Street
	8 hours	1.9 ppb	2 ppb	1.5 ppb	2.5 ppb	9.0 (State)	

Notes:

[1] Ozone, PM_{10}, $PM_{2.5}$ data obtained from CARB iDAM: Air Quality Data Statistics. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. Available at: https://www.arb.ca.gov/adam/select8/sc8start.php.

[2] SO_2, NO_2, and CO data obtained from EPA AirData. Available at: https://www.epa.gov/outdoor-air-quality-data/monitor-values-report. Accessed: September 2021.

[3] Most Stringent Ambient Air Quality Standard obtained from the table of ambient air quality standards available at: https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf. Accessed: September 2021.

Abbreviations:

CARB - California Air Resources Board
CO - carbon monoxide
EPA - Environmental Protection Agency
NO_2 - nitrogen dioxide
ppb - parts per billion
ppm - parts per million
PM_{10} - particulate matter less than 10 microns in diameter
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
SO_2 - sulfur dioxide
µg/m^3 - micrograms per cubic meter

Table 2-4. Frequency of Air Quality Standard Violations
Costco Commercial Center
Fresno, California

Monitoring Site	Year	Number of Days Exceeding Standard[1,2]					
		National 24-Hour PM_{10}	State 24-Hour PM_{10}	National 24-Hour $PM_{2.5}$	State 1-Hour O_3	State 8-Hour O_3	National 8-Hour O_3
Fresno-Sierra Skypark #2 (O3); Fresno-Garland (PM2.5, PM10)	2017	1	97	31	6	46	44
	2018	0	103	36	4	30	27
	2019	3	73	10	2	9	9
	2020	14	100	45	8	19	18

Notes:

[1] * = There was insufficient (or no) data available to determine the value.

[2] Ozone, PM_{10}, $PM_{2.5}$ data obtained from CARB iDAM: Air Quality Data Statistics. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. Available at: https://arb.ca.gov/adam/select8/sc8start.php. Accessed: September 2021.

Abbreviations:

CARB - California Air Resources Board

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

Table 3-1. SJVAPCD Air Quality Significance Thresholds
Costco Commercial Center
Fresno, California

Criteria Air Pollutant Annual Thresholds (tons/year)[1]			
		Operation	
Pollutant	Construction	Permitted Equipment and Activities	Non-Permitted Equipment and Activities
NO_X	10	10	10
VOC	10	10	10
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15
SO_X	27	27	27
CO	100	100	100
Toxic Air Contaminants (TACs) Thresholds[2]			
Carcinogens	Maximum Exposed Individual Cancer Risk ≥ 20 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)		
Non-Carcinogens	Acute: Hazard Index equals or exceeds 1 for the Maximally Exposed Individual		
	Chronic: Hazard Index equals or exceeds 1 for the Maximally Exposed Individual		

Source:

[1] SJVAPCD. San Joaquin Valley Air Pollution Control District Air Quality Thresholds of Significance - Criteria Pollutants. Available at: http://www.valleyair.org/transportation/0714-GAMAQI-Criteria-Pollutant-Thresholds-of-Significance.pdf. Accessed: January 2022.

[2] SJVAPCD. San Joaquin Valley Air Pollution Control District Air Quality Thresholds of Significance - Toxic Air Contaminants. Available at: http://www.valleyair.org/transportation/0714-GAMAQI-TACs-Thresholds-of-Significance.pdf. Accessed: January 2022.

Abbreviations:

$\mu g/m^3$ - micrograms per cubic meter
CO - carbon monoxide
CO_2e - carbon dioxide equivalents
GHG - greenhouse gases
lbs - pounds
MT - metric ton
NO_2 - nitrogen dioxide
NOx - nitrogen oxides
PM_{10} - respirable particulate matter
$PM_{2.5}$ - fine particulate matter
ppm - parts per million
SJVAPCD - San Joaquin Valley Air Pollution Control District
SO_2 - sulfur dioxide
SO_x - sulfur oxides
TACs - toxic air contaminants
VOC - volatile organic compounds
yr - year

Table 4-1. Construction Schedule
Costco Commercial Center
Fresno, California

CalEEMod® Phase Type[1]	Start Date[1]	End Date[1]	Phase Duration[2] (days)
Demolition	5/1/2023	5/8/2023	7
Site Preparation	5/1/2023	5/8/2023	7
Grading	5/9/2023	6/12/2023	30
Grading/BC Overlap	6/13/2023	7/5/2023	20
Building Construction	7/6/2023	11/10/2023	110
Paving	7/29/2023	9/13/2023	40
Architectural Coating	9/14/2023	11/10/2023	50

Notes:
[1] Construction phases and duration are based on Project-specific estimates.
[2] The construction work week was assumed to be 6 days per week.

Abbreviations:
CalEEMod® - California Emissions Estimator Model

Table 4-2. Construction Equipment
Costco Commercial Center
Fresno, California

Phase Name	Offroad Equipment Type[1]	Number of Equipment[1]	Usage Hours[2] (hours/day)	Equipment Horsepower[2] (hp)	Equipment Load Factor[2]
Demolition	Concrete/Industrial Saws	1	8	81	0.73
	Excavators	3	8	158	0.38
	Rubber Tired Dozers	2	8	247	0.4
Site Preparation	Tractors/Loaders/Backhoes	4	8	97	0.37
Grading	Graders	3	8	187	0.41
	Other Construction Equipment	2	8	401	0.42
	Paving Equipment	1	8	132	0.36
	Rubber Tired Dozers	4	8	247	0.4
	Scrapers	2	8	367	0.48
	Surfacing Equipment	1	8	263	0.3
	Tractors/Loaders/Backhoes	2	8	97	0.37
Grading/BC Overlap	Excavators	3	8	158	0.38
	Rough Terrain Forklifts	2	8	100	0.4
	Rubber Tired Dozers	3	8	247	0.4
	Tractors/Loaders/Backhoes	3	8	97	0.37
Building Construction	Excavators	3	8	158	0.38
	Rough Terrain Forklifts	2	8	100	0.4
	Rubber Tired Dozers	3	8	247	0.4
	Tractors/Loaders/Backhoes	3	7	97	0.37
Paving	Rough Terrain Forklifts	1	8	100	0.4
	Rubber Tired Dozers	2	8	247	0.4
	Tractors/Loaders/Backhoes	2	8	97	0.37
Architectural Coating	Air Compressors	1	6	78	0.48

Notes:

[1] Number and type of offroad equipment for the Grading, Grading/BC Overlap, Building Construction, and Paving phases based on Project-specific data. Equipment used in the Demolition and Architectural Coating phases are based on CalEEMod® default values.

[2] Equipment usage hours, horsepower, and load factor are based on CalEEMod® defaults, with the exception of the horsepower value for "Other Construction Equipment" during the Grading phase. The "Other Construction Equipment" represents soil compactors and is based is based on project-specific data.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

hp - horsepower

Table 4-3. Construction Material Movement
Costco Commercial Center
Fresno, California

Phase Name	Material Imported[1] (yd^3)	Material Exported[1] (yd^3)
Grading	60,000	0
Grading/BC Overlap	0	3,000

Notes:

[1] Soil import and export quantities based on project-specific data.

Abbreviations:

yd^3 - cubic yard

Table 4-4. Construction Demolition Assumptions
Costco Commercial Center
Fresno, California

Phase Name	Size Metric	Unit Amount[1]
Demolition/Site Prep	Tons of Debris	10

Notes:

[1] Square-footage quantity based on project-specific data.

Table 4-5. Annual and Daily Criteria Air Pollutant Emission Estimates for Project Construction
Costco Commercial Center
Fresno, California

Scenario	Annual Criteria Air Pollutant Emission Estimates[1] (tons/year)						Daily Criteria Air Pollutant Emission Estimates[1] (pounds/day)					
	VOC[2]	**NO_x**	**CO**	**SO_x[3]**	**PM_{10}**	**$PM_{2.5}$**	**VOC[2]**	**NO_x**	**CO**	**SO_x[3]**	**PM_{10}**	**$PM_{2.5}$**
Project Construction[4]	2.1	3.9	4.6	0.01	0.6	0.2	11.3	21.4	25.4	0.1	3.3	1.3
SJVAPCD Significance Thresholds[5]	**10**	**10**	**100**	**27**	**15**	**15**	100	100	100	100	100	100
Exceeds Threshold for any Year of Construction?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Notes:

[1] Total emissions for project construction were estimated using CalEEMod® (see Appendix A). Total construction emissions include construction of the fuel station, warehouse, car wash, and parking lot.

[2] For purposes of this analysis VOC emissions are assumed to be equal to ROG.

[3] For purposes of this analysis SO_X emissions are assumed to be equal to SO_2.

[4] Construction emissions assume watering control consistent with SJVAPCD Rule 8021. Construction equipment greater than 50 hp used at the site shall meet USEPA Tier 3 emission standards for PM_{10} and $PM_{2.5}$ and include particulate matter emissions control equivalent to CARB Level 3 verifiable diesel emission control devices.

[5] SJVAPCD Air Quality Significance Thresholds. Available at http://www.valleyair.org/transportation/0714-GAMAQI-Criteria-Pollutant-Thresholds-of-Significance.pdf. Accessed: January 2022.

Abbreviations:

CalEEMod® - CALifornia Emissions Estimator MODel
CARB - California Air Resources Board
CO - carbon monoxide
lbs - pounds
NO_x - nitrogen oxide compounds (NO + NO_2)
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
PM_{10} - particulate matter less than 10 microns in diameter
ROG - reactive organic gases
SJVAPCD - San Joaquin Valley Air Pollution Control District
SO_2 - sulfur dioxide
SO_x - sulfur oxide compounds
USEPA - United States Environmental Protection Agency
VOC - volatile organic compounds

Table 4-6. Gasoline Dispensing Facility Operational VOC Emissions
Costco Commercial Center
Fresno, California

Scenario	VOC Emission Factor[1] (lb/1,000 gallons)						Emissions[2] (tons/year)
	Loading	Breathing	Refueling	Hose Permeation	Spillage	Total	
Herndon/Riverside	0.15	0.024	0.356	0.009	0.24	**0.779**	**9.9**

Notes:

[1] Emission factors obtained from SJVAPCD staff via email on October 13, 2021 for EVR Phase I and EVR Phase II Installed Underground Tank.

[2] Herndon/Riverside emissions are estimated using a throughput of 25.5 million gallons/year.

Abbreviations:

EVR - enhanced vapor recovery

lb - pounds

SJVAPCD - San Joaquin Valley Air Pollution Control District

VOC - volatile organic compounds

Table 4-7. TRU Criteria Air Pollutant Emission Calculations
Costco Commercial Center
Fresno, California

Emission Factor[1,2] (g/bhp-hr)	VOC	NOx	CO	SO_x	PM_{10}	$PM_{2.5}$
	2.52	2.12	0.32	0.002	0.06	0.06

Scenario	Number of Round Trips with TRUs[3]	Annual Average TRU Emissions (tons/year)					
		VOC	NOx	CO	SO_x	PM_{10}	$PM_{2.5}$
Herndon/Riverside	712	0.39	0.33	0.05	0.000	0.009	0.009

Notes:

[1] Emission factors obtained from OFFROAD2021 emissions output for Calendar Year 2023, Transportation Refrigeration Unit - Instate Trailer and Transportation Refrigeration Unit - Out-Of-State Trailer in Fresno County.

[2] SO_X emission factors based on sulfur content of ultra-low sulfur diesel fuel (15 ppm) and fuel consumption from OFFROAD2021.

[3] Approximately 15% of warehouse delivery trucks are equipped with TRUs.

[4] Horsepower is based on SJVAPCD Guidance for Air Dispersion Modeling, section 2.3.1 Transportation Refrigeration unit (TRU), Modeling Parameters.

[5] Load factor obtained from CARB Draft 2019 Update to Emissions Inventory for Transport Refrigeration Units, for TRUs Over 25 hp, 2013 and newer. Available at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/cold-storage/documents/hra_emissioninventory2019.pdf. Accessed: January 2022.

[6] TRU Cycle Duration is based on 2 hours of off-site loading time plus the duration of the on-site and off-site transit. It is assumed that loading/unloading will occur while the TRU is plugged in, so no emissions are estimated for this time period. Assumptions based on Table II.G.1 of CARB Proposed Amendments to the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate. Available at: https://ww2.arb.ca.gov/sites/default/files/barcu/board/rulemaking/tru2021/appi.pdf. Accessed: May 2022.

Abbreviations:

CARB - California Air Resources Board
CO - carbon dioxide
NOx - oxides of nitrogen
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
SJVAPCD - San Joaquin Valley Air Pollution Control District
SOx - sulfur oxide compounds
TRU - transportation refrigeration unit
VOCs - Volatile Organic Compounds

Constants:

Horsepower [4]	50	bhp
Load Factor [5]	0.38	
TRU Cycle Duration [6]	622	minutes
Fuel Consumption[2]	0.040	gal/hp-hr
Fuel Sulfur Content[2]	15	ppm
Density of Diesel	3,221	g/gal

Conversion Factors:

453.592	g/lb
1000000	g/MT
60	min/hr
365	day/year
2000	lb/ton

Table 4-8a. Annual Criteria Air Pollutant Emission Estimates for Project Operation
Costco Commercial Center
Fresno, California

Emission Category	Annual Criteria Air Pollutant Emission Estimates[1] (tons/year)					
	VOC[2]	**NO_x**	**CO**	**SO_x[3]**	**PM_{10}**	**$PM_{2.5}$**
Permitted						
Gasoline Dispensing Facility	9.9	--	--	--	--	--
Permitted Total	**9.9**	--	--	--	--	--
SJVAPCD Significance Thresholds[4]	**10**	**10**	**100**	**27**	**15**	**15**
Exceeds Threshold?	NO	--	--	--	--	--
Non-permitted						
Area[5]	0.95	0.00	0.01	0.00	0.00	0.00
Energy[5]	0.01	0.13	0.11	0.00	0.01	0.01
Mobile[6]	8.6	11.8	81.3	0.2	18.1	4.6
Non-permitted Total	**9.5**	**11.9**	**81.4**	**0.2**	**18.1**	**4.6**
SJVAPCD Significance Thresholds[4]	**10**	**10**	**100**	**27**	**15**	**15**
Exceeds Threshold?	NO	YES	NO	NO	YES	NO
Annual Emissions Reduction from Rule 9510 Compliance[7]	--	-3.0	--	--	-9.1	--
Non-permitted Total with Rule Compliance[8]	**9.5**	**8.9**	**81.4**	**0.2**	**9.1**	**4.6**
Exceeds Threshold?	NO	NO	NO	NO	NO	NO

Notes:

[1] Emissions totals may not add up due to rounding. Emissions shown as zero may be non-zero values; however, they are below a meaningful reporting level for this analysis.

[2] For purposes of this analysis VOC emissions are assumed to be equal to ROG.

[3] For purposes of this analysis SO_x emissions are assumed to be equal to SO_2.

[4] SJVAPCD Air Quality Significance Thresholds. Available at http://www.valleyair.org/transportation/0714-GAMAQI-Criteria-Pollutant-Thresholds-of-Significance.pdf. Accessed: January 2022.

[5] Total area and energy emissions were estimated using CalEEMod® (see Appendix A).

[6] Total mobile emissions include emissions from on-road vehicles and TRUs. On-road mobile emissions were estimated using CalEEMod® default trip lengths, EMFAC2021 emission factors, and Project-specific vehicle trip rates provided by Kittelson & Associates, See Appendix B for details. TRU emissions were estimated using OFFROAD2021 emission factors.

[7] The annual emissions reductions from Rule 9510 compliance for NOx and PM_{10} are calculated using the SJVAPCD Indirect Source Rule Fee Estimator available at: https://ww2.valleyair.org/media/q2jdhwze/fee-estimator.xlsm. Accessed: February 2023.

Abbreviations:

CalEEMod® - CALifornia Emissions Estimator MODel
CO - carbon monoxide
EMFAC - EMission FACtors model
lbs - pounds
NO_x - nitrogen oxide compounds (NO + NO_2)
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
PM_{10} - particulate matter less than 10 microns in diameter
ROG - reactive organic gases
SJVAPCD - San Joaquin Valley Air Pollution Control District
SO_2 - sulfur dioxide
SO_x - sulfur oxide compounds
VOC - volatile organic compounds

Table 4-8b. On-Site Daily Criteria Air Pollutant Emission Estimates for Project Operation
Costco Commercial Center
Fresno, California

Emission Category	On-Site Daily Criteria Air Pollutant Emission Estimates[1]					
	VOC[2]	NO_x	CO	SO_x[3]	PM_{10}	$PM_{2.5}$
	(lbs/day)					
Permitted On-Site						
Gasoline Dispensing Facility[4]	54.4	--	--	--	--	--
Total Daily Permitted On-Site Emissions (lb/day)	**54.4**	--	--	--	--	--
SJVAPCD Significance Thresholds[5]	**100**	**100**	**100**	**100**	**100**	**100**
Exceeds Threshold?	NO	--	--	--	--	--
Non-permitted On-Site						
Area[6]	5.19	0.00	0.06	0.00	0.00	0.00
Energy[6]	0.08	0.74	0.62	0.00	0.06	0.06
Mobile on-road	12.0	9.1	97.6	0.1	0.2	0.1
Mobile TRU Emissions	0.01	0.01	0.00	0.00	0.00	0.00
Mobile[7]	12.0	9.1	97.6	0.1	0.2	0.1
Total Daily Non-permitted On-Site Emissions (lb/day)	**17.3**	**9.8**	**98.3**	**0.1**	**0.3**	**0.2**
SJVAPCD Significance Thresholds[5]	**100**	**100**	**100**	**100**	**100**	**100**
Exceeds Threshold?	NO	NO	NO	NO	NO	NO

Notes:

[1] Emissions totals may not add up due to rounding. Emissions shown as zero may be non-zero values; however, they are below a meaningful reporting level for this analysis.

[2] For purposes of this analysis VOC emissions are assumed to be equal to ROG.

[3] For purposes of this analysis SO_X emissions are assumed to be equal to SO_2.

[4] The gasoline dispensing facility VOC emissions are for the Herndon/Riverside facility.

[5] SJVAPCD Air Quality Significance Thresholds. Available at http://www.valleyair.org/transportation/0714-GAMAQI-Criteria-Pollutant-Thresholds-of-Significance.pdf. Accessed: January 2022.

[6] Total area and energy emissions were estimated using CalEEMod® (see Appendix A).

[7] Total mobile emissions include emissions from on-road vehicles and TRUs. On-road mobile emissions were estimated using CalEEMod® default trip lengths, EMFAC2021 emission factors, and Project-specific vehicle trip rates provided by Kittelson & Associates, See Appendix B for details. TRU emissions were estimated using OFFROAD2021 emission factors.

Abbreviations:

CalEEMod® - CALifornia Emissions Estimator MODel
CO - carbon monoxide
EMFAC - EMission FACtors model
lbs - pounds
NO_x - nitrogen oxide compounds (NO + NO_2)
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
PM_{10} - particulate matter less than 10 microns in diameter
ROG - reactive organic gases
SJVAPCD - San Joaquin Valley Air Pollution Control District
SO_2 - sulfur dioxide
SO_x - sulfur oxide compounds
VOC - volatile organic compounds

Table 5-1. HARP Health Risk Assessment Options for Construction HRA
Costco Commercial Center
Fresno, California

HARP2 Risk Analyses Screen/ Option Title		Options Chosen[1]				
		Residential Cancer Risk Run	**Residential Chronic Risk Run**	**Worker Cancer Risk Run**	**Worker Chronic Risk Run**	**Acute Risk Run**
Select Risk Scenario	Analysis Type	Cancer Risk	Chronic Risk (Non-cancer)	Cancer Risk	Chronic Risk (Non-cancer)	Acute Risk (Non-cancer)
	Receptor Type	Individual Resident		Worker		N/A
	Exposure Duration[2]	0.53-Year (0 start age)	N/A	0.53-Year (16 start age)	N/A	N/A
	Intake Rate Percentile	95th percentile (High End)	95th percentile (High End)	95th percentile (High End)		N/A
Select Pathways to Evaluate	Tab "Pathways to Evaluate"	User Defined		Select "Worker Pathways"		Default Inhalation Only Pathway
		Select deposition rate of 0.05 m/s		Select deposition rate of 0.05 m/s		
	Tab "Inh"	Uncheck "Apply fraction of time spent at home (FAH) to ages greater than or equal to 16 years"		Check box "Use Adjustment Factors" with WAF = 1.87[3]		Use Defaults (No Change)
	Tab "Soil"	Use Defaults (No Change)		Use Defaults (No Change)		N/A
	Tab "Derm"	Warm Climate		Warm Climate		N/A
	Tab "MMlk"	Use Defaults (No Change)		N/A	N/A	N/A
	Tab "HG Produce"	Use Defaults (No Change)		N/A	N/A	N/A
	Tab "Pig, Chicken, & Egg"	Use Defaults (No Change)		N/A	N/A	N/A

Notes:

[1] Options were chosen based on SJVAPCD's Draft HRA Guidance provided to Ramboll by Kyle Melching (SJVAPCD) on August 4, 2021.

[2] Exposure duration was set to 0.53 years to reflect the duration of construction activity (i.e. 193 days).

[3] Annual concentration adjustment factor for worker is set based on a construction schedule of 7:00 AM to 10:00 PM, 6 days a week.

Abbreviations:

ADMRT - Air Dispersion Modeling and Risk Tool
HARP - Hotspots Analysis and Reporting Program
N/A - not applicable
SJVAPCD - San Joaquin Valley Air Pollution Control District

Table 5-2. HARP Health Risk Assessment Options for Operational HRA
Costco Commercial Center
Fresno, California

HARP2 Risk Analyses Screen/ Option Title		Options Chosen[1]			
		Residential Cancer Risk Run	**Residential Chronic Risk Run**	**Worker Cancer Risk Run**	**Worker Chronic Risk Run**
Select Risk Scenario	Analysis Type	Cancer Risk	Chronic Risk (Non-cancer)	Cancer Risk	Chronic Risk (Non-cancer)
	Receptor Type	Individual Resident		Worker	
	Exposure Duration[2]	69.47-Year	N/A	39.47-Year (16.53 start age)	N/A
	Intake Rate Percentile	95th percentile (High End)		95th percentile (High End)	
Select Pathways to Evaluate	Tab "Pathways to Evaluate"	User Defined		Select "Worker Pathways"	
		Select deposition rate of 0.05 m/s		Select deposition rate of 0.05 m/s	
	Tab "Inh"	Uncheck "Apply fraction of time spent at home (FAH) to ages greater than or equal to 16 years"		Check box "Use Adjustment Factors" with worker adjustment factor (WAF) = 1.5[3]	
	Tab "Soil"	Use Defaults (No Change)		Use Defaults (No Change)	
	Tab "Derm"	Warm Climate		Warm Climate	
	Tab "MMlk"	Use Defaults (No Change)		N/A	N/A
	Tab "HG Produce"	Use Defaults (No Change)		N/A	N/A
	Tab "Pig, Chicken, & Egg"	Use Defaults (No Change)		N/A	N/A

Notes:

[1] Options were chosen based on SJVAPCD's Draft HRA Guidance provided to Ramboll by Kyle Melching (SJVAPCD) on August 4, 2021.

[2] Exposure duration reflects the start of Project operation after a 0.53-year construction duration.

[3] Annual concentration adjustment factor for workers is set based on Costco general operating hours of 16 hours per day and 7 days a week.

Abbreviations:

ADMRT - Air Dispersion Modeling and Risk Tool
HARP - Hotspots Analysis and Reporting Program
HRA - health risk assessment
N/A - not applicable
SJVAPCD - San Joaquin Valley Air Pollution Control District

Table 5-3. Health Risk Assessment Results
Costco Commercial Center
Fresno, California

Receptor Type	Maximum Estimated Cancer Risk (in a million)	Maximum Estimated Chronic Hazard Index	Maximum Estimated Acute Hazard Index
Project Construction			
Residential	1.3	0.00	0.00
Sensitive	0.2	0.00	0.00
Worker	0.0	0.00	0.00
Project Operational			
Residential	5.1	0.01	0.14
Sensitive	0.8	0.00	0.02
Worker	3.4	0.07	0.52
Total Health Risk[1,2]			
Residential	6.4	0.01	0.14
Sensitive	1.0	0.00	0.02
Worker	3.4	0.07	0.52
SJVAPCD Threshold[3]	20	1	1

Notes:

[1] Total cancer risk and chronic hazard index values are provided relative to the maximally impacted receptors from Project operation.

[2] Acute health hazard index is provided as a maximum of construction and operational values. These values are not additive due to the short-term risk impacts.

[3] SJVAPCD CEQA Thresholds of Significance. Available at: http://www.valleyair.org/transportation/0714-GAMAQI-TACs-Thresholds-of-Significance.pdf. Accessed: July 2022.

Abbreviations:

CEQA - California Environmental Quality Act

SJVAPCD - San Joaquin Valley Air Pollution Control District

FIGURES

Site Boundary
Construction Trucks
Construction Offroad Equipment

0 500 1,000 Feet

MODELED CONSTRUCTION EMISSION SOURCES

Costco Commercial Center
Fresno, California

FIGURE 1

RAMBOLL US Consulting
A RAMBOLL COMPANY

RAMBOLL

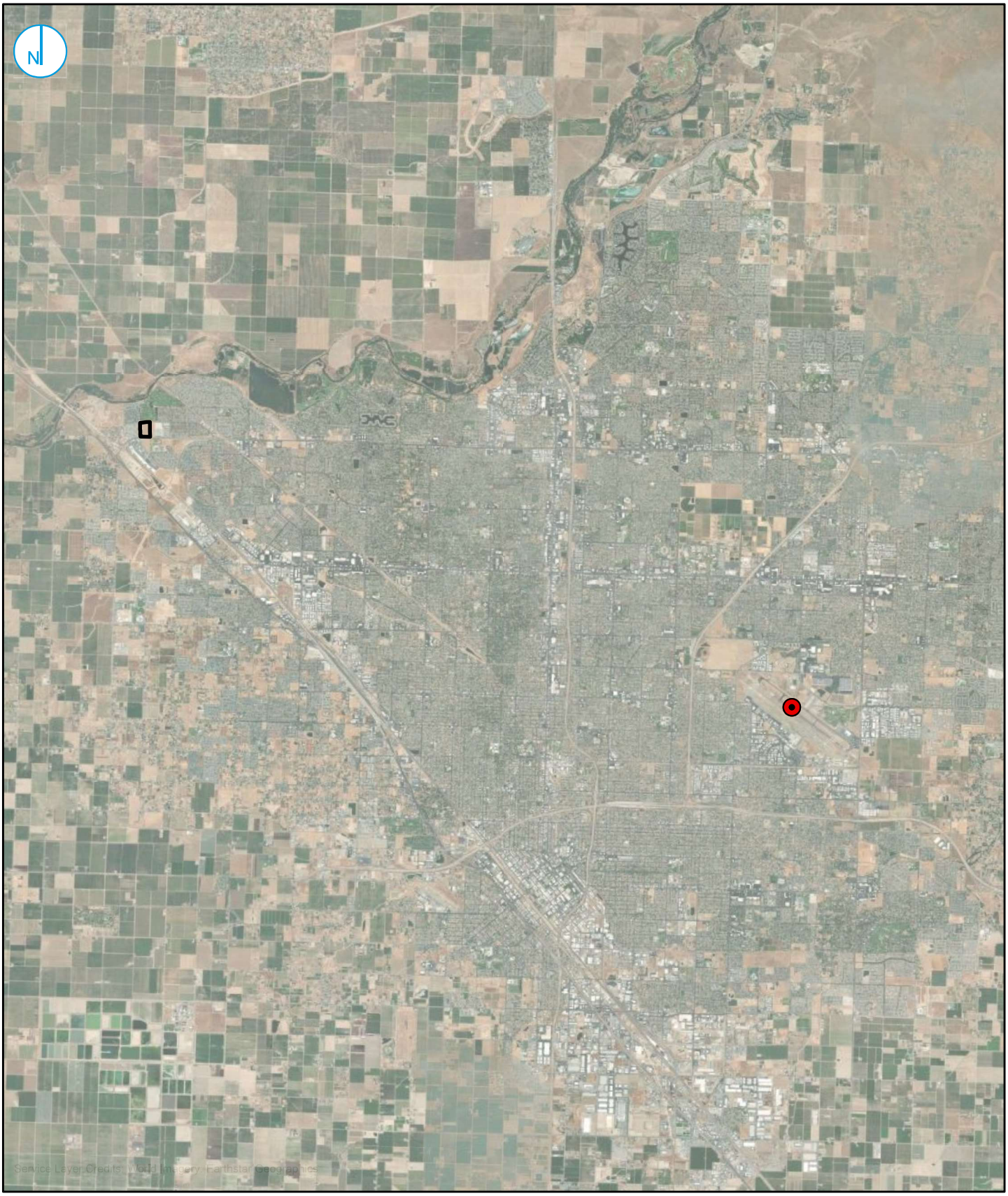
MODELED OPERATIONAL EMISSION SOURCES

Costco Commercial Center
Fresno, California

FIGURE 2

RAMBOLL US Consulting
A RAMBOLL COMPANY

RAMBOLL



Site Boundary

Meteorological Station

0 500 1,000 Feet

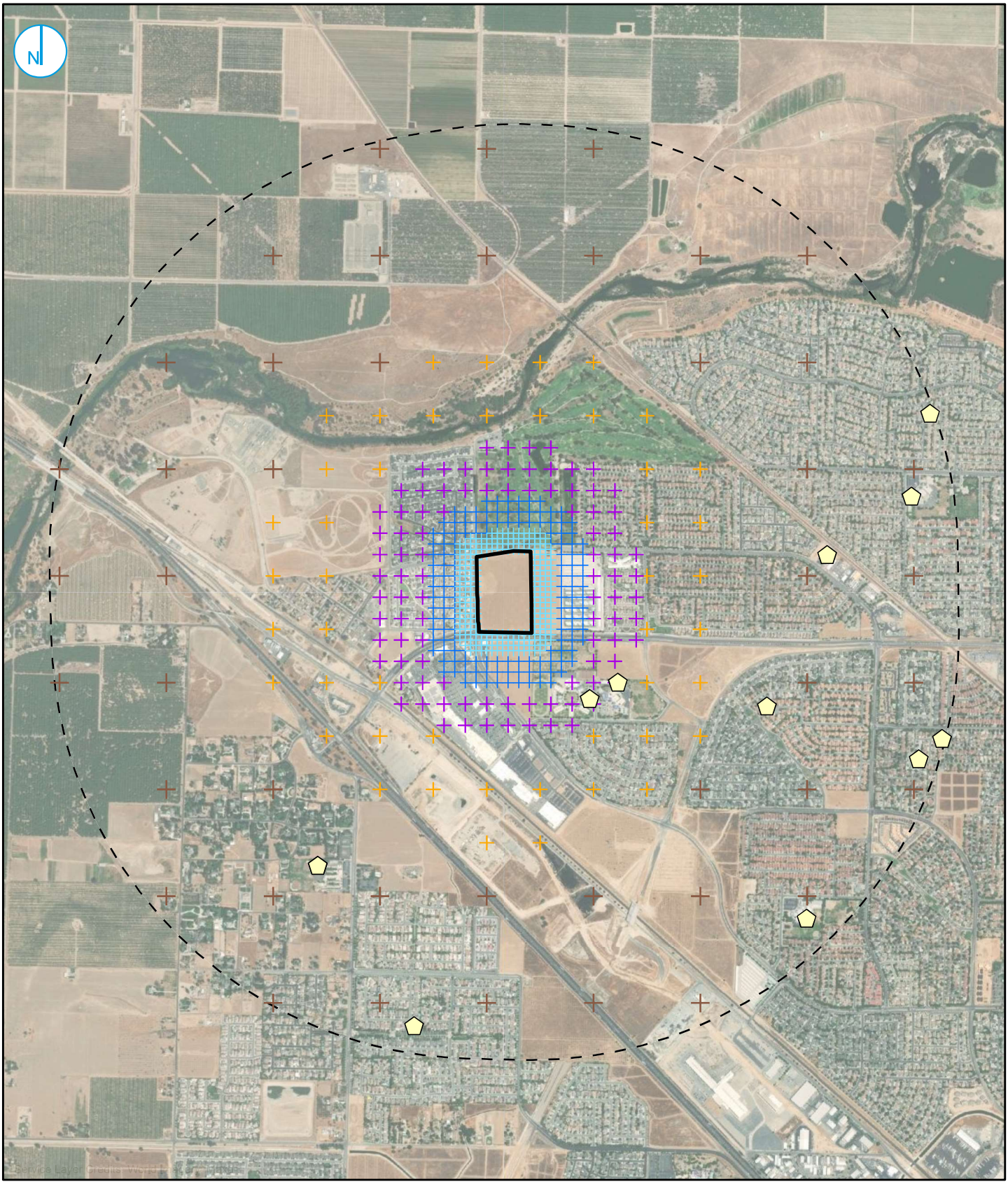
METEOROLOGICAL STATION LOCATION

FIGURE 3

Costco Commercial Center
Fresno, California

RAMBOLL US Consulting
A RAMBOLL COMPANY

RAMBOLL



MODELED GRID AND SENSITIVE RECEPTORS

Costco Commercial Center
Fresno, California

FIGURE 4

RAMBOLL US Consulting
A RAMBOLL COMPANY

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APPENDIX A
CALEEMOD® OUTPUT

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Costco Fresno Mitigated Construction Run

Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	889.00	Space	15.55	355,600.00	0
Automobile Care Center	4.80	1000sqft	0.11	4,800.00	0
Discount Club	241.34	1000sqft	5.54	241,340.00	0
Gasoline/Service Station	32.00	Pump	1.33	4,517.60	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	191.61	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project-specific information (RPS Emission Factor)

Land Use - Project-specific information

Construction Phase - Project-specific information

Off-road Equipment -

Off-road Equipment - Project-specific information

Off-road Equipment -

Off-road Equipment - Project-specific information

Off-road Equipment - Project-specific information

Off-road Equipment - Project-specific information

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment -

Trips and VMT - Project-specific information

Demolition - Project-specific information

Grading - Project-specific information

Vehicle Trips - Unmitigated Construction Run

Consumer Products - Unmitigated Construction Run

Area Coating - Unmitigated Construction Run

Landscape Equipment - Unmitigated Construction Run

Energy Use - Unmitigated Construction Run

Water And Wastewater - Unmitigated Construction Run

Solid Waste - Unmitigated Construction Run

Construction Off-road Equipment Mitigation - Water 2x/day to comply with SJVAPCD Rule 8021. All construction equipment >50 hp mitigated to Tier 3 + Level 3 DPF.

Vehicle Emission Factors -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	125329	0
tblAreaCoating	Area_Nonresidential_Interior	375986	0
tblAreaCoating	Area_Parking	21336	0
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	50.00
tblConstructionPhase	NumDays	370.00	110.00
tblConstructionPhase	NumDays	20.00	7.00
tblConstructionPhase	NumDays	35.00	30.00

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	35.00	20.00
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	10.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	4/11/2025	11/10/2023
tblConstructionPhase	PhaseEndDate	2/14/2025	11/10/2023
tblConstructionPhase	PhaseEndDate	5/26/2023	5/8/2023
tblConstructionPhase	PhaseEndDate	7/28/2023	6/12/2023
tblConstructionPhase	PhaseEndDate	9/15/2023	7/5/2023
tblConstructionPhase	PhaseEndDate	3/14/2025	9/13/2023
tblConstructionPhase	PhaseEndDate	6/9/2023	5/8/2023
tblConstructionPhase	PhaseStartDate	3/15/2025	9/14/2023
tblConstructionPhase	PhaseStartDate	9/16/2023	7/6/2023
tblConstructionPhase	PhaseStartDate	6/10/2023	5/9/2023
tblConstructionPhase	PhaseStartDate	7/29/2023	6/13/2023
tblConstructionPhase	PhaseStartDate	2/15/2025	7/29/2023
tblConstructionPhase	PhaseStartDate	5/27/2023	5/1/2023
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	LightingElect	2.70	0.00
tblEnergyUse	LightingElect	3.71	0.00
tblEnergyUse	LightingElect	2.70	0.00

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	4.16	0.00
tblEnergyUse	NT24E	2.30	0.00
tblEnergyUse	NT24E	4.16	0.00
tblEnergyUse	NT24NG	3.84	0.00
tblEnergyUse	NT24NG	2.08	0.00
tblEnergyUse	NT24NG	3.84	0.00
tblEnergyUse	T24E	1.75	0.00
tblEnergyUse	T24E	1.91	0.00
tblEnergyUse	T24E	1.75	0.00
tblEnergyUse	T24NG	16.86	0.00
tblEnergyUse	T24NG	8.53	0.00
tblEnergyUse	T24NG	16.86	0.00
tblGrading	MaterialExported	0.00	3,000.00
tblGrading	MaterialImported	0.00	60,000.00
tblLandscapeEquipment	NumberSummerDays	180	0
tblLandUse	LotAcreage	8.00	15.55
tblLandUse	LotAcreage	0.10	1.33
tblOffRoadEquipment	HorsePower	172.00	401.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblProjectCharacteristics	CO2IntensityFactor	203.98	191.61
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	18.34	0.00
tblSolidWaste	SolidWasteGenerationRate	1,037.93	0.00
tblSolidWaste	SolidWasteGenerationRate	17.25	0.00

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	HaulingTripNumber	1.00	2.00
tblVehicleTrips	ST_TR	23.72	0.00
tblVehicleTrips	ST_TR	53.75	0.00
tblVehicleTrips	ST_TR	182.17	0.00
tblVehicleTrips	SU_TR	11.88	0.00
tblVehicleTrips	SU_TR	33.67	0.00
tblVehicleTrips	SU_TR	166.88	0.00
tblVehicleTrips	WD_TR	23.72	0.00
tblVehicleTrips	WD_TR	41.80	0.00
tblVehicleTrips	WD_TR	172.01	0.00
tblWater	IndoorWaterUseRate	451,589.32	0.00
tblWater	IndoorWaterUseRate	17,876,662.33	0.00
tblWater	IndoorWaterUseRate	425,020.45	0.00
tblWater	OutdoorWaterUseRate	276,780.55	0.00
tblWater	OutdoorWaterUseRate	10,956,664.01	0.00
tblWater	OutdoorWaterUseRate	260,496.40	0.00

2.0 Emissions Summary

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	2.2806	4.5511	3.7117	0.0113	0.9356	0.1729	1.1085	0.3872	0.1595	0.5467	0.0000	1,026.9395	1,026.9395	0.1854	0.0533	1,047.4410
Maximum	**2.2806**	**4.5511**	**3.7117**	**0.0113**	**0.9356**	**0.1729**	**1.1085**	**0.3872**	**0.1595**	**0.5467**	**0.0000**	**1,026.9395**	**1,026.9395**	**0.1854**	**0.0533**	**1,047.4410**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	2.0686	3.9074	4.6415	0.0113	0.5786	0.0294	0.6080	0.2169	0.0291	0.2459	0.0000	1,026.9388	1,026.9388	0.1854	0.0533	1,047.4403
Maximum	**2.0686**	**3.9074**	**4.6415**	**0.0113**	**0.5786**	**0.0294**	**0.6080**	**0.2169**	**0.0291**	**0.2459**	**0.0000**	**1,026.9388**	**1,026.9388**	**0.1854**	**0.0533**	**1,047.4403**

	ROG	NOx	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	**9.30**	**14.14**	**-25.05**	**0.00**	**38.16**	**82.99**	**45.15**	**43.99**	**81.76**	**55.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	5-1-2023	7-31-2023	3.2883	2.7515
2	8-1-2023	9-30-2023	2.0410	1.7429
		Highest	3.2883	2.7515

2.2 Overall Operational

Unmitigated Operational

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

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

	ROG	NOx	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	5/1/2023	5/8/2023	6	7	
2	Site Preparation	Site Preparation	5/1/2023	5/8/2023	6	7	
3	Grading	Grading	5/9/2023	6/12/2023	6	30	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4	Grading/BC Overlap	Grading	6/13/2023	7/5/2023	6	20	
5	Building Construction	Building Construction	7/6/2023	11/10/2023	6	110	
6	Paving	Paving	7/29/2023	9/13/2023	6	40	
7	Architectural Coating	Architectural Coating	9/14/2023	11/10/2023	6	50	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 165

Acres of Paving: 15.55

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 375,986; Non-Residential Outdoor: 125,329; Striped Parking Area: 21,336 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Graders	3	8.00	187	0.41
Grading	Other Construction Equipment	2	8.00	401	0.42
Grading	Paving Equipment	1	8.00	132	0.36
Grading	Rubber Tired Dozers	4	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Surfacing Equipment	1	8.00	263	0.30
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading/BC Overlap	Excavators	3	8.00	158	0.38
Grading/BC Overlap	Rough Terrain Forklifts	2	8.00	100	0.40
Grading/BC Overlap	Rubber Tired Dozers	3	8.00	247	0.40
Grading/BC Overlap	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Excavators	3	8.00	158	0.38

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Building Construction	Rough Terrain Forklifts	2	8.00	100	0.40
Building Construction	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Paving	Rough Terrain Forklifts	1	8.00	100	0.40
Paving	Rubber Tired Dozers	2	8.00	247	0.40
Paving	Tractors/Loaders/Backhoes	2	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	6	15.00	0.00	2.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	15	38.00	0.00	7,500.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading/BC Overlap	11	28.00	0.00	375.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	11	230.00	99.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	46.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1000e-004	0.0000	1.1000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9400e-003	0.0752	0.0688	1.4000e-004		3.4900e-003	3.4900e-003		3.2500e-003	3.2500e-003	0.0000	11.8972	11.8972	3.3300e-003	0.0000	11.9805
Total	**7.9400e-003**	**0.0752**	**0.0688**	**1.4000e-004**	**1.1000e-004**	**3.4900e-003**	**3.6000e-003**	**2.0000e-005**	**3.2500e-003**	**3.2700e-003**	**0.0000**	**11.8972**	**11.8972**	**3.3300e-003**	**0.0000**	**11.9805**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	1.3000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0567	0.0567	0.0000	1.0000e-005	0.0593
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.5000e-004	1.7700e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5083	0.5083	1.0000e-005	1.0000e-005	0.5126
Total	**2.1000e-004**	**2.8000e-004**	**1.8000e-003**	**1.0000e-005**	**6.7000e-004**	**0.0000**	**6.8000e-004**	**1.7000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5650**	**0.5650**	**1.0000e-005**	**2.0000e-005**	**0.5719**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2400e-003	0.0641	0.0864	1.4000e-004		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	11.8972	11.8972	3.3300e-003	0.0000	11.9805
Total	**3.2400e-003**	**0.0641**	**0.0864**	**1.4000e-004**	**5.0000e-005**	**4.5000e-004**	**5.0000e-004**	**1.0000e-005**	**4.5000e-004**	**4.6000e-004**	**0.0000**	**11.8972**	**11.8972**	**3.3300e-003**	**0.0000**	**11.9805**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	1.3000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0567	0.0567	0.0000	1.0000e-005	0.0593
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.5000e-004	1.7700e-003	1.0000e-005	6.5000e-004	0.0000	6.6000e-004	1.7000e-004	0.0000	1.8000e-004	0.0000	0.5083	0.5083	1.0000e-005	1.0000e-005	0.5126
Total	**2.1000e-004**	**2.8000e-004**	**1.8000e-003**	**1.0000e-005**	**6.7000e-004**	**0.0000**	**6.8000e-004**	**1.7000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5650**	**0.5650**	**1.0000e-005**	**2.0000e-005**	**0.5719**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1200e-003	0.0215	0.0312	4.0000e-005		1.0600e-003	1.0600e-003		9.8000e-004	9.8000e-004	0.0000	3.8302	3.8302	1.2400e-003	0.0000	3.8612
Total	**2.1200e-003**	**0.0215**	**0.0312**	**4.0000e-005**	**0.0000**	**1.0600e-003**	**1.0600e-003**	**0.0000**	**9.8000e-004**	**9.8000e-004**	**0.0000**	**3.8302**	**3.8302**	**1.2400e-003**	**0.0000**	**3.8612**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.0000e-004	1.1800e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3389	0.3389	1.0000e-005	1.0000e-005	0.3417
Total	**1.4000e-004**	**1.0000e-004**	**1.1800e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3389**	**0.3389**	**1.0000e-005**	**1.0000e-005**	**0.3417**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0600e-003	0.0243	0.0328	4.0000e-005		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004	0.0000	3.8302	3.8302	1.2400e-003	0.0000	3.8612
Total	**1.0600e-003**	**0.0243**	**0.0328**	**4.0000e-005**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**3.8302**	**3.8302**	**1.2400e-003**	**0.0000**	**3.8612**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.0000e-004	1.1800e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3389	0.3389	1.0000e-005	1.0000e-005	0.3417
Total	**1.4000e-004**	**1.0000e-004**	**1.1800e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3389**	**0.3389**	**1.0000e-005**	**1.0000e-005**	**0.3417**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4522	0.0000	0.4522	0.2086	0.0000	0.2086	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1079	1.1479	0.7006	1.9600e-003		0.0465	0.0465		0.0428	0.0428	0.0000	172.1647	172.1647	0.0557	0.0000	173.5567
Total	**0.1079**	**1.1479**	**0.7006**	**1.9600e-003**	**0.4522**	**0.0465**	**0.4987**	**0.2086**	**0.0428**	**0.2514**	**0.0000**	**172.1647**	**172.1647**	**0.0557**	**0.0000**	**173.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-003	0.4693	0.0990	2.2100e-003	0.0642	4.4300e-003	0.0686	0.0177	4.2400e-003	0.0219	0.0000	212.4374	212.4374	1.3900e-003	0.0334	222.4289
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-003	1.6100e-003	0.0192	6.0000e-005	7.0900e-003	3.0000e-005	7.1200e-003	1.8800e-003	3.0000e-005	1.9100e-003	0.0000	5.5190	5.5190	1.3000e-004	1.4000e-004	5.5650
Total	**0.0103**	**0.4709**	**0.1182**	**2.2700e-003**	**0.0713**	**4.4600e-003**	**0.0757**	**0.0195**	**4.2700e-003**	**0.0238**	**0.0000**	**217.9564**	**217.9564**	**1.5200e-003**	**0.0336**	**227.9939**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2035	0.0000	0.2035	0.0939	0.0000	0.0939	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0480	0.9363	1.0751	1.9600e-003		5.6200e-003	5.6200e-003		5.6200e-003	5.6200e-003	0.0000	172.1645	172.1645	0.0557	0.0000	173.5565
Total	**0.0480**	**0.9363**	**1.0751**	**1.9600e-003**	**0.2035**	**5.6200e-003**	**0.2091**	**0.0939**	**5.6200e-003**	**0.0995**	**0.0000**	**172.1645**	**172.1645**	**0.0557**	**0.0000**	**173.5565**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-003	0.4693	0.0990	2.2100e-003	0.0642	4.4300e-003	0.0686	0.0177	4.2400e-003	0.0219	0.0000	212.4374	212.4374	1.3900e-003	0.0334	222.4289
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-003	1.6100e-003	0.0192	6.0000e-005	7.0900e-003	3.0000e-005	7.1200e-003	1.8800e-003	3.0000e-005	1.9100e-003	0.0000	5.5190	5.5190	1.3000e-004	1.4000e-004	5.5650
Total	**0.0103**	**0.4709**	**0.1182**	**2.2700e-003**	**0.0713**	**4.4600e-003**	**0.0757**	**0.0195**	**4.2700e-003**	**0.0238**	**0.0000**	**217.9564**	**217.9564**	**1.5200e-003**	**0.0336**	**227.9939**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Grading/BC Overlap - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1967	0.0000	0.1967	0.1011	0.0000	0.1011	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0329	0.3343	0.3036	5.7000e-004		0.0151	0.0151		0.0139	0.0139	0.0000	50.3819	50.3819	0.0163	0.0000	50.7893
Total	**0.0329**	**0.3343**	**0.3036**	**5.7000e-004**	**0.1967**	**0.0151**	**0.2118**	**0.1011**	**0.0139**	**0.1149**	**0.0000**	**50.3819**	**50.3819**	**0.0163**	**0.0000**	**50.7893**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-004	0.0235	4.9500e-003	1.1000e-004	3.2100e-003	2.2000e-004	3.4300e-003	8.8000e-004	2.1000e-004	1.0900e-003	0.0000	10.6219	10.6219	7.0000e-005	1.6700e-003	11.1215
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1300e-003	7.9000e-004	9.4400e-003	3.0000e-005	3.4800e-003	2.0000e-005	3.5000e-003	9.2000e-004	1.0000e-005	9.4000e-004	0.0000	2.7111	2.7111	6.0000e-005	7.0000e-005	2.7337
Total	**1.5300e-003**	**0.0243**	**0.0144**	**1.4000e-004**	**6.6900e-003**	**2.4000e-004**	**6.9300e-003**	**1.8000e-003**	**2.2000e-004**	**2.0300e-003**	**0.0000**	**13.3329**	**13.3329**	**1.3000e-004**	**1.7400e-003**	**13.8551**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Grading/BC Overlap - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0885	0.0000	0.0885	0.0455	0.0000	0.0455	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0141	0.2857	0.3759	5.7000e-004		2.1800e-003	2.1800e-003		2.1800e-003	2.1800e-003	0.0000	50.3819	50.3819	0.0163	0.0000	50.7892
Total	**0.0141**	**0.2857**	**0.3759**	**5.7000e-004**	**0.0885**	**2.1800e-003**	**0.0907**	**0.0455**	**2.1800e-003**	**0.0477**	**0.0000**	**50.3819**	**50.3819**	**0.0163**	**0.0000**	**50.7892**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-004	0.0235	4.9500e-003	1.1000e-004	3.2100e-003	2.2000e-004	3.4300e-003	8.8000e-004	2.1000e-004	1.0900e-003	0.0000	10.6219	10.6219	7.0000e-005	1.6700e-003	11.1215
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1300e-003	7.9000e-004	9.4400e-003	3.0000e-005	3.4800e-003	2.0000e-005	3.5000e-003	9.2000e-004	1.0000e-005	9.4000e-004	0.0000	2.7111	2.7111	6.0000e-005	7.0000e-005	2.7337
Total	**1.5300e-003**	**0.0243**	**0.0144**	**1.4000e-004**	**6.6900e-003**	**2.4000e-004**	**6.9300e-003**	**1.8000e-003**	**2.2000e-004**	**2.0300e-003**	**0.0000**	**13.3329**	**13.3329**	**1.3000e-004**	**1.7400e-003**	**13.8551**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1776	1.8072	1.6238	3.0900e-003		0.0814	0.0814		0.0748	0.0748	0.0000	271.4578	271.4578	0.0878	0.0000	273.6527
Total	**0.1776**	**1.8072**	**1.6238**	**3.0900e-003**		**0.0814**	**0.0814**		**0.0748**	**0.0748**	**0.0000**	**271.4578**	**271.4578**	**0.0878**	**0.0000**	**273.6527**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.6200e-003	0.2227	0.0698	1.0000e-003	0.0327	1.3900e-003	0.0340	9.4400e-003	1.3300e-003	0.0108	0.0000	95.4877	95.4877	5.3000e-004	0.0144	99.7859
Worker	0.0511	0.0357	0.4263	1.3400e-003	0.1573	7.3000e-004	0.1580	0.0418	6.7000e-004	0.0425	0.0000	122.4820	122.4820	2.9000e-003	3.1900e-003	123.5038
Total	**0.0567**	**0.2584**	**0.4961**	**2.3400e-003**	**0.1899**	**2.1200e-003**	**0.1920**	**0.0512**	**2.0000e-003**	**0.0532**	**0.0000**	**217.9697**	**217.9697**	**3.4300e-003**	**0.0176**	**223.2896**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0758	1.5354	2.0193	3.0900e-003		0.0116	0.0116		0.0116	0.0116	0.0000	271.4575	271.4575	0.0878	0.0000	273.6524
Total	**0.0758**	**1.5354**	**2.0193**	**3.0900e-003**		**0.0116**	**0.0116**		**0.0116**	**0.0116**	**0.0000**	**271.4575**	**271.4575**	**0.0878**	**0.0000**	**273.6524**

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	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.6200e-003	0.2227	0.0698	1.0000e-003	0.0327	1.3900e-003	0.0340	9.4400e-003	1.3300e-003	0.0108	0.0000	95.4877	95.4877	5.3000e-004	0.0144	99.7859
Worker	0.0511	0.0357	0.4263	1.3400e-003	0.1573	7.3000e-004	0.1580	0.0418	6.7000e-004	0.0425	0.0000	122.4820	122.4820	2.9000e-003	3.1900e-003	123.5038
Total	**0.0567**	**0.2584**	**0.4961**	**2.3400e-003**	**0.1899**	**2.1200e-003**	**0.1920**	**0.0512**	**2.0000e-003**	**0.0532**	**0.0000**	**217.9697**	**217.9697**	**3.4300e-003**	**0.0176**	**223.2896**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0356	0.3745	0.2593	5.4000e-004		0.0168	0.0168		0.0154	0.0154	0.0000	47.0096	47.0096	0.0152	0.0000	47.3896
Paving	0.0204					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0559**	**0.3745**	**0.2593**	**5.4000e-004**		**0.0168**	**0.0168**		**0.0154**	**0.0154**	**0.0000**	**47.0096**	**47.0096**	**0.0152**	**0.0000**	**47.3896**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0500e-003	7.3000e-004	8.7600e-003	3.0000e-005	3.2300e-003	1.0000e-005	3.2500e-003	8.6000e-004	1.0000e-005	8.7000e-004	0.0000	2.5174	2.5174	6.0000e-005	7.0000e-005	2.5384
Total	**1.0500e-003**	**7.3000e-004**	**8.7600e-003**	**3.0000e-005**	**3.2300e-003**	**1.0000e-005**	**3.2500e-003**	**8.6000e-004**	**1.0000e-005**	**8.7000e-004**	**0.0000**	**2.5174**	**2.5174**	**6.0000e-005**	**7.0000e-005**	**2.5384**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0131	0.2697	0.3271	5.4000e-004		2.0600e-003	2.0600e-003		2.0600e-003	2.0600e-003	0.0000	47.0095	47.0095	0.0152	0.0000	47.3896
Paving	0.0204					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0335**	**0.2697**	**0.3271**	**5.4000e-004**		**2.0600e-003**	**2.0600e-003**		**2.0600e-003**	**2.0600e-003**	**0.0000**	**47.0095**	**47.0095**	**0.0152**	**0.0000**	**47.3896**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0500e-003	7.3000e-004	8.7600e-003	3.0000e-005	3.2300e-003	1.0000e-005	3.2500e-003	8.6000e-004	1.0000e-005	8.7000e-004	0.0000	2.5174	2.5174	6.0000e-005	7.0000e-005	2.5384
Total	**1.0500e-003**	**7.3000e-004**	**8.7600e-003**	**3.0000e-005**	**3.2300e-003**	**1.0000e-005**	**3.2500e-003**	**8.6000e-004**	**1.0000e-005**	**8.7000e-004**	**0.0000**	**2.5174**	**2.5174**	**6.0000e-005**	**7.0000e-005**	**2.5384**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.8169					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7900e-003	0.0326	0.0453	7.0000e-005		1.7700e-003	1.7700e-003		1.7700e-003	1.7700e-003	0.0000	6.3831	6.3831	3.8000e-004	0.0000	6.3927
Total	**1.8217**	**0.0326**	**0.0453**	**7.0000e-005**		**1.7700e-003**	**1.7700e-003**		**1.7700e-003**	**1.7700e-003**	**0.0000**	**6.3831**	**6.3831**	**3.8000e-004**	**0.0000**	**6.3927**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6500e-003	3.2500e-003	0.0388	1.2000e-004	0.0143	7.0000e-005	0.0144	3.8000e-003	6.0000e-005	3.8600e-003	0.0000	11.1347	11.1347	2.6000e-004	2.9000e-004	11.2276
Total	**4.6500e-003**	**3.2500e-003**	**0.0388**	**1.2000e-004**	**0.0143**	**7.0000e-005**	**0.0144**	**3.8000e-003**	**6.0000e-005**	**3.8600e-003**	**0.0000**	**11.1347**	**11.1347**	**2.6000e-004**	**2.9000e-004**	**11.2276**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.8169					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4900e-003	0.0339	0.0458	7.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004	0.0000	6.3831	6.3831	3.8000e-004	0.0000	6.3927
Total	**1.8184**	**0.0339**	**0.0458**	**7.0000e-005**		**3.6000e-004**	**3.6000e-004**		**3.6000e-004**	**3.6000e-004**	**0.0000**	**6.3831**	**6.3831**	**3.8000e-004**	**0.0000**	**6.3927**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6500e-003	3.2500e-003	0.0388	1.2000e-004	0.0143	7.0000e-005	0.0144	3.8000e-003	6.0000e-005	3.8600e-003	0.0000	11.1347	11.1347	2.6000e-004	2.9000e-004	11.2276
Total	**4.6500e-003**	**3.2500e-003**	**0.0388**	**1.2000e-004**	**0.0143**	**7.0000e-005**	**0.0144**	**3.8000e-003**	**6.0000e-005**	**3.8600e-003**	**0.0000**	**11.1347**	**11.1347**	**2.6000e-004**	**2.9000e-004**	**11.2276**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Automobile Care Center	0.00	0.00	0.00		
Discount Club	0.00	0.00	0.00		
Gasoline/Service Station	0.00	0.00	0.00		
Parking Lot	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
Automobile Care Center	14.70	6.60	6.60	33.00	48.00	19.00	21	51	28
Discount Club	14.70	6.60	6.60	16.70	64.30	19.00	45	40	15
Gasoline/Service Station	14.70	6.60	6.60	2.00	79.00	19.00	14	27	59

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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
Parking Lot	14.70	6.60	6.60	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
Automobile Care Center	0.510058	0.053037	0.175964	0.161396	0.026773	0.007006	0.013819	0.022114	0.000717	0.000291	0.024206	0.001529	0.003090
Discount Club	0.510058	0.053037	0.175964	0.161396	0.026773	0.007006	0.013819	0.022114	0.000717	0.000291	0.024206	0.001529	0.003090
Gasoline/Service Station	0.510058	0.053037	0.175964	0.161396	0.026773	0.007006	0.013819	0.022114	0.000717	0.000291	0.024206	0.001529	0.003090
Parking Lot	0.510058	0.053037	0.175964	0.161396	0.026773	0.007006	0.013819	0.022114	0.000717	0.000291	0.024206	0.001529	0.003090

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Automobile Care Center	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Discount Club	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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**

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Automobile Care Center	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Discount Club	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Automobile Care Center	0	0.0000	0.0000	0.0000	0.0000
Discount Club	0	0.0000	0.0000	0.0000	0.0000
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Automobile Care Center	0	0.0000	0.0000	0.0000	0.0000
Discount Club	0	0.0000	0.0000	0.0000	0.0000
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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

6.2 Area by SubCategory

Unmitigated

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

Costco Fresno Mitigated Construction Run - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

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

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Automobile Care Center	0 / 0	0.0000	0.0000	0.0000	0.0000
Discount Club	0 / 0	0.0000	0.0000	0.0000	0.0000
Gasoline/Service Station	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Automobile Care Center	0 / 0	0.0000	0.0000	0.0000	0.0000
Discount Club	0 / 0	0.0000	0.0000	0.0000	0.0000
Gasoline/Service Station	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Automobile Care Center	0	0.0000	0.0000	0.0000	0.0000
Discount Club	0	0.0000	0.0000	0.0000	0.0000
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Automobile Care Center	0	0.0000	0.0000	0.0000	0.0000
Discount Club	0	0.0000	0.0000	0.0000	0.0000
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Equipment Type	Number

11.0 Vegetation

Costco Fresno (Project) Operation - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Costco Fresno (Project) Operation

Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	889.00	Space	8.00	355,600.00	0
Automobile Care Center	4.80	1000sqft	0.11	4,800.00	0
Discount Club	241.34	1000sqft	5.54	241,340.00	0
Gasoline/Service Station	32.00	Pump	0.10	4,517.60	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	191.61	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project-specific values (RPS emission factor)

Land Use - Project-specific values

Construction Phase - Operational run

Off-road Equipment - Operational run

Vehicle Trips - Project-specific values, mobile emissions calculated seperately

Consumer Products - Updated emission factor for consumer products to refine the VOC emissions based on recent CARB regulations.

Table Name	Column Name	Default Value	New Value
tblConsumerProducts	ROG_EF	2.14E-05	1.62E-05

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	203.98	191.61
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	23.72	0.00
tblVehicleTrips	ST_TR	53.75	0.00
tblVehicleTrips	ST_TR	182.17	0.00
tblVehicleTrips	SU_TR	11.88	0.00
tblVehicleTrips	SU_TR	33.67	0.00
tblVehicleTrips	SU_TR	166.88	0.00
tblVehicleTrips	WD_TR	23.72	0.00
tblVehicleTrips	WD_TR	41.80	0.00
tblVehicleTrips	WD_TR	172.01	0.00

2.0 Emissions Summary

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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

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

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9467	1.0000e-004	0.0107	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0209	0.0209	5.0000e-005	0.0000	0.0222
Energy	0.0149	0.1350	0.1134	8.1000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	330.8528	330.8528	0.0345	6.5300e-003	333.6620
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	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	217.9149	0.0000	217.9149	12.8784	0.0000	539.8748
Water						0.0000	0.0000		0.0000	0.0000	5.9496	12.3158	18.2653	0.6132	0.0147	37.9717
Total	**0.9616**	**0.1351**	**0.1241**	**8.1000e-004**	**0.0000**	**0.0103**	**0.0103**	**0.0000**	**0.0103**	**0.0103**	**223.8644**	**343.1895**	**567.0539**	**13.5261**	**0.0212**	**911.5307**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9467	1.0000e-004	0.0107	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0209	0.0209	5.0000e-005	0.0000	0.0222
Energy	0.0149	0.1350	0.1134	8.1000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	330.8528	330.8528	0.0345	6.5300e-003	333.6620
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	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	217.9149	0.0000	217.9149	12.8784	0.0000	539.8748
Water						0.0000	0.0000		0.0000	0.0000	5.9496	12.3158	18.2653	0.6132	0.0147	37.9717
Total	**0.9616**	**0.1351**	**0.1241**	**8.1000e-004**	**0.0000**	**0.0103**	**0.0103**	**0.0000**	**0.0103**	**0.0103**	**223.8644**	**343.1895**	**567.0539**	**13.5261**	**0.0212**	**911.5307**

	ROG	NOx	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	4/1/2023	4/30/2023	5	20	

Acres of Grading (Site Preparation Phase): 0

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Acres of Grading (Grading Phase): 0

Acres of Paving: 8

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Excavators	0	8.00	158	0.38
Demolition	Rubber Tired Dozers	0	8.00	247	0.40

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	0	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2023

Unmitigated Construction On-Site

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

Unmitigated Construction Off-Site

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

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2023

Mitigated Construction On-Site

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

Mitigated Construction Off-Site

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

4.0 Operational Detail - Mobile

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Automobile Care Center	0.00	0.00	0.00		
Discount Club	0.00	0.00	0.00		
Gasoline/Service Station	0.00	0.00	0.00		
Parking Lot	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
Automobile Care Center	14.70	6.60	6.60	33.00	48.00	19.00	21	51	28
Discount Club	14.70	6.60	6.60	16.70	64.30	19.00	45	40	15
Gasoline/Service Station	14.70	6.60	6.60	2.00	79.00	19.00	14	27	59
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Automobile Care Center	0.510058	0.053037	0.175964	0.161396	0.026773	0.007006	0.013819	0.022114	0.000717	0.000291	0.024206	0.001529	0.003090
Discount Club	0.510058	0.053037	0.175964	0.161396	0.026773	0.007006	0.013819	0.022114	0.000717	0.000291	0.024206	0.001529	0.003090
Gasoline/Service Station	0.510058	0.053037	0.175964	0.161396	0.026773	0.007006	0.013819	0.022114	0.000717	0.000291	0.024206	0.001529	0.003090
Parking Lot	0.510058	0.053037	0.175964	0.161396	0.026773	0.007006	0.013819	0.022114	0.000717	0.000291	0.024206	0.001529	0.003090

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	183.9160	183.9160	0.0317	3.8400e-003	185.8520
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	183.9160	183.9160	0.0317	3.8400e-003	185.8520
NaturalGas Mitigated	0.0149	0.1350	0.1134	8.1000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	146.9368	146.9368	2.8200e-003	2.6900e-003	147.8100
NaturalGas Unmitigated	0.0149	0.1350	0.1134	8.1000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	146.9368	146.9368	2.8200e-003	2.6900e-003	147.8100

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Automobile Care Center	99360	5.4000e-004	4.8700e-003	4.0900e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3022	5.3022	1.0000e-004	1.0000e-004	5.3337
Discount Club	2.56062e+006	0.0138	0.1255	0.1054	7.5000e-004		9.5400e-003	9.5400e-003		9.5400e-003	9.5400e-003	0.0000	136.6443	136.6443	2.6200e-003	2.5100e-003	137.4563
Gasoline/Service Station	93514.3	5.0000e-004	4.5800e-003	3.8500e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9903	4.9903	1.0000e-004	9.0000e-005	5.0199
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0149**	**0.1350**	**0.1134**	**8.1000e-004**		**0.0103**	**0.0103**		**0.0103**	**0.0103**	**0.0000**	**146.9368**	**146.9368**	**2.8200e-003**	**2.7000e-003**	**147.8100**

Costco Fresno (Project) Operation - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Automobile Care Center	99360	5.4000e-004	4.8700e-003	4.0900e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3022	5.3022	1.0000e-004	1.0000e-004	5.3337
Discount Club	2.56062e+006	0.0138	0.1255	0.1054	7.5000e-004		9.5400e-003	9.5400e-003		9.5400e-003	9.5400e-003	0.0000	136.6443	136.6443	2.6200e-003	2.5100e-003	137.4563
Gasoline/Service Station	93514.3	5.0000e-004	4.5800e-003	3.8500e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9903	4.9903	1.0000e-004	9.0000e-005	5.0199
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0149**	**0.1350**	**0.1134**	**8.1000e-004**		**0.0103**	**0.0103**		**0.0103**	**0.0103**	**0.0000**	**146.9368**	**146.9368**	**2.8200e-003**	**2.7000e-003**	**147.8100**

Costco Fresno (Project) Operation - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Automobile Care Center	41328	3.5919	6.2000e-004	7.0000e-005	3.6297
Discount Club	1.91141e+006	166.1263	0.0286	3.4700e-003	167.8751
Gasoline/Service Station	38896.5	3.3806	5.8000e-004	7.0000e-005	3.4162
Parking Lot	124460	10.8172	1.8600e-003	2.3000e-004	10.9310
Total		**183.9160**	**0.0317**	**3.8400e-003**	**185.8520**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Automobile Care Center	41328	3.5919	6.2000e-004	7.0000e-005	3.6297
Discount Club	1.91141e+006	166.1263	0.0286	3.4700e-003	167.8751
Gasoline/Service Station	38896.5	3.3806	5.8000e-004	7.0000e-005	3.4162
Parking Lot	124460	10.8172	1.8600e-003	2.3000e-004	10.9310
Total		**183.9160**	**0.0317**	**3.8400e-003**	**185.8520**

6.0 Area Detail

6.1 Mitigation Measures Area

Costco Fresno (Project) Operation - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.9467	1.0000e-004	0.0107	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0209	0.0209	5.0000e-005	0.0000	0.0222
Unmitigated	0.9467	1.0000e-004	0.0107	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0209	0.0209	5.0000e-005	0.0000	0.0222

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1817					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7641					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	9.9000e-004	1.0000e-004	0.0107	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0209	0.0209	5.0000e-005	0.0000	0.0222
Total	**0.9467**	**1.0000e-004**	**0.0107**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.0209**	**0.0209**	**5.0000e-005**	**0.0000**	**0.0222**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1817					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7641					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	9.9000e-004	1.0000e-004	0.0107	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0209	0.0209	5.0000e-005	0.0000	0.0222
Total	**0.9467**	**1.0000e-004**	**0.0107**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.0209**	**0.0209**	**5.0000e-005**	**0.0000**	**0.0222**

7.0 Water Detail

7.1 Mitigation Measures Water

Costco Fresno (Project) Operation - Fresno County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	18.2653	0.6132	0.0147	37.9717
Unmitigated	18.2653	0.6132	0.0147	37.9717

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Automobile Care Center	0.451589 / 0.276781	0.4398	0.0148	3.5000e-004	0.9144
Discount Club	17.8767 / 10.9567	17.4115	0.5845	0.0140	36.1967
Gasoline/Service Station	0.42502 / 0.260496	0.4140	0.0139	3.3000e-004	0.8606
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**18.2653**	**0.6132**	**0.0147**	**37.9717**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Automobile Care Center	0.451589 / 0.276781	0.4398	0.0148	3.5000e-004	0.9144
Discount Club	17.8767 / 10.9567	17.4115	0.5845	0.0140	36.1967
Gasoline/Service Station	0.42502 / 0.260496	0.4140	0.0139	3.3000e-004	0.8606
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**18.2653**	**0.6132**	**0.0147**	**37.9717**

8.0 Waste Detail

8.1 Mitigation Measures Waste

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	217.9149	12.8784	0.0000	539.8748
Unmitigated	217.9149	12.8784	0.0000	539.8748

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Automobile Care Center	18.34	3.7229	0.2200	0.0000	9.2232
Discount Club	1037.93	210.6904	12.4515	0.0000	521.9766
Gasoline/Service Station	17.25	3.5016	0.2069	0.0000	8.6751
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**217.9149**	**12.8784**	**0.0000**	**539.8748**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Automobile Care Center	18.34	3.7229	0.2200	0.0000	9.2232
Discount Club	1037.93	210.6904	12.4515	0.0000	521.9766
Gasoline/Service Station	17.25	3.5016	0.2069	0.0000	8.6751
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**217.9149**	**12.8784**	**0.0000**	**539.8748**

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Equipment Type	Number

11.0 Vegetation

APPENDIX B
MOBILE SOURCE EMISSION CALCULATIONS

Table B-1a. Trip Lengths and Vehicle Miles Traveled by Operational Mobile Sources (Herndon/Riverside)
Costco Commercial Center
Fresno, California

Trip Type		Average One-Way Trip Length[1,2]	Peak Daily Trips (one-way trips/day)[3]	Peak Daily VMT[4]	Annual Average Trips (one-way trips/yr)	Annual Average VMT
Member Vehicles	Primary	17.3	10,046	173,528	3,666,790	63,337,720
	Diverted	1.0	4,038	4,119	1,473,870	1,503,435
	Pass-By	0.1	3,788	379	1,382,620	138,262
Warehouse, Fuel Station, and Car Wash Employee Vehicles	Primary	30.7	300	9,210	109,500	3,361,650
MDO Driver and Warehouse Employee Vehicles	Primary	30.7	136	4,175	49,640	1,523,875
MDO Delivery Trucks	Primary	81.5	20	1,630	7,300	594,950
Fuel Delivery Trucks	Primary	125.0	14	1,750	5,110	638,750
Warehouse Delivery Trucks	Primary	125.0	26	3,250	9,490	1,186,250

Notes:

[1] Average trip lengths for primary and diverted trip types are based on Project-specific data provided by Kittelson & Associates. Pass-by trip length for member vehicles is assumed to be equal to the CalEEMod® default trip length of 0.1 miles.

[2] Average trip length for MDO delivery trucks provided by Costco. The average routed round trip length for Fresno MDO delivery trucks is 163 miles.

[3] Peak daily trips are based on Project-specific data provided by Kittelson & Associates.

[4] Peak daily VMT based on Project-specific data provided by Kittelson & Associates or estimated as a product of average trip length and number of trips presented in this table.

Abbreviations:

CalEEMod® - CALifornia Emissions Estimator MODel

MDO - market delivery operation

VMT - vehicle miles traveled

Table B-1b. Trip Lengths and Vehicle Miles Traveled by Operational Mobile Sources (4500 W. Shaw Avenue)
Costco Commercial Center
Fresno, California

Trip Type		Peak Daily Trips (one-way trips/day)[1]	Peak Daily VMT[2]	Annual Average Trips (one-way trips/yr)	Annual Average VMT
Passenger Vehicles	Primary	1,363	58,264	497,495	21,266,360
	Pass-by	48	0	17,520	0
	Diverted	2,099	3,442	766,135	1,256,330

Notes:

[1] Peak daily trips are based on Project-specific data provided by Kittelson & Associates.

[2] Peak daily VMT based on Project-specific data provided by Kittelson & Associates or estimated as a product of average trip length and number of trips presented in this table.

Abbreviations:

CalEEMod® - CALifornia Emissions Estimator MODel

MDO - market delivery operation

VMT - vehicle miles traveled

Table B-2. Operational Mobile Source Fleet Mixes
Costco Commercial Center
Fresno, California

Vehicle Category	Fuel Type	Fleet Mix CalEEMod® Default[1]	EMFAC VMT Output[2] (miles/day)	Employee Vehicle Fleet Mix[3]	Member Vehicle Fleet Mix[4]
LDA	Gas	51.0%	12,057,533	52.8%	55.0%
	Phe		351,337	1.54%	1.6%
	Elec		514,390	2.25%	0%
	Dsl		22,675	0.10%	0%
LDT1	Gas	5.3%	1,013,826	5.88%	5.9%
	Phe		1,027	0.01%	0.0%
	Elec		1,049	0.01%	0%
	Dsl		250	0.00%	0%
LDT2	Gas	17.6%	5,488,159	19.29%	19.4%
	Phe		39,774	0.14%	0.1%
	Elec		17,710	0.06%	0%
	Dsl		14,595	0.05%	0%
MDV	Gas	16.1%	4,629,686	17.47%	17.8%
	Phe		29,118	0.11%	0.1%
	Elec		19,405	0.07%	0%
	Dsl		71,606	0.27%	0%
LHD1	All	2.7%	--	--	--
LHD2	All	0.7%	--	--	--
MHD	All	1.4%	--	--	--
HHDT	All	2.2%	--	--	--
OBUS	All	0.1%	--	--	--
UBUS	All	0.0%	--	--	--
MCY	All	2.4%	--	--	--
SBUS	All	0.2%	--	--	--
MH	All	0.3%	--	--	--

Notes:

[1] CalEEMod® default for Fresno County calendar year 2023.

[2] Data obtained from EMFAC2021 for default emissions activity.

[3] Fleet mix for employee vehicles estimated based on the ratio of the vehicle classes in CalEEMod® default fleet mix and the EMFAC2021 VMT output.

[4] Fleet mix for member vehicles visiting the Costco Gas Station are estimated based on the ratio of the vehicle classes in CalEEMod® default fleet mix and the EMFAC2021 VMT output. Vehicles are assumed to be gasoline or plug-in hybrid.

Abbreviations:

CalEEMod® - CALifornia Emissions Estimator MODel
EMFAC - EMission FACtors model
HHDT - Heavy heavy-duty truck
LDA - light duty automobiles
LDT - light-duty trucks
LHD - light heavy-duty trucks
MCY - motorcycles
MDV - medium-duty vehicle
MH - motor homes
MHD - medium heavy-duty trucks
OBUS - other buses
SBUS - school buses
UBUS - urban buses
VMT - vehicle miles traveled

Table B-3. Operational Mobile Source CAP Emission Factors - Running Exhaust, Running Loss, Tire Wear, and Brake Wear
Costco Commercial Center
Fresno, California

EMFAC Vehicle Class	Fuel	EMFAC VMT Output[1] (miles/day)	EMFAC Emissions Output[1,2] (tons/day)					
			VOC[3]	NO_x	CO	SO_x	PM_{10}[4]	$PM_{2.5}$[4]
Passenger Vehicles[5]								
LDA	Gas	12,057,533	0.51	0.58	10.53	0.04	0.20	0.07
LDA	Phe	351,337	0.00	0.00	0.09	0.00	0.00	0.00
LDA	Elec	514,390	0.00	0.00	0.00	0.00	0.01	0.00
LDA	Dsl	22,675	0.00	0.01	0.01	0.00	0.00	0.00
LDT1	Gas	1,013,826	0.16	0.21	2.25	0.00	0.02	0.01
LDT1	Phe	1,027	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Elec	1,049	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Dsl	250	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gas	5,488,159	0.28	0.52	6.01	0.02	0.10	0.03
LDT2	Phe	39,774	0.00	0.00	0.01	0.00	0.00	0.00
LDT2	Elec	17,710	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Dsl	14,595	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Gas	4,629,686	0.34	0.67	6.18	0.02	0.08	0.03
MDV	Phe	29,118	0.00	0.00	0.01	0.00	0.00	0.00
MDV	Elec	19,405	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Dsl	71,606	0.00	0.01	0.02	0.00	0.00	0.00
Delivery Trucks[5]								
HHDT	Dsl	2,030,441	0.03	3.94	0.16	0.03	0.32	0.14

EMFAC Vehicle Class	Fuel	Running Exhaust, Running Loss, Tire Wear and Brake Wear Emission Factors[6] (grams/mile)					
		VOC[3]	NO_x	CO	SO_x	PM_{10}[4]	$PM_{2.5}$[4]
Passenger Vehicles[5]							
LDA	Gas	0.038	0.044	0.793	0.003	0.015	0.005
LDA	Phe	0.005	0.003	0.221	0.001	0.012	0.004
LDA	Elec	0.000	0.000	0.000	0.000	0.012	0.004
LDA	Dsl	0.032	0.275	0.339	0.002	0.035	0.024
LDT1	Gas	0.141	0.192	2.013	0.003	0.017	0.007
LDT1	Phe	0.003	0.003	0.201	0.001	0.012	0.004
LDT1	Elec	0.000	0.000	0.000	0.000	0.012	0.004
LDT1	Dsl	0.268	1.602	1.824	0.004	0.247	0.226
LDT2	Gas	0.046	0.086	0.994	0.004	0.016	0.006
LDT2	Phe	0.003	0.003	0.209	0.001	0.012	0.004
LDT2	Elec	0.000	0.000	0.000	0.000	0.012	0.004
LDT2	Dsl	0.016	0.080	0.136	0.003	0.023	0.012
MDV	Gas	0.067	0.131	1.210	0.004	0.017	0.006
MDV	Phe	0.004	0.003	0.220	0.001	0.012	0.004
MDV	Elec	0.000	0.000	0.000	0.000	0.012	0.004
MDV	Dsl	0.013	0.103	0.209	0.004	0.023	0.012

Table B-3. Operational Mobile Source CAP Emission Factors - Running Exhaust, Running Loss, Tire Wear, and Brake Wear
Costco Commercial Center
Fresno, California

EMFAC Vehicle Class	Fuel	Running Exhaust, Running Loss, Tire Wear and Brake Wear Emission Factors[6] (grams/mile)					
		VOC[3]	NO_x	CO	SO_x	PM_{10}[4]	$PM_{2.5}$[4]
Member Vehicle Weighted Emission Factor[7]		**0.050**	**0.075**	**0.967**	**0.003**	**0.016**	**0.005**
Employee Vehicle Weighted Emission Factor[7]		**0.049**	**0.075**	**0.945**	**0.003**	**0.016**	**0.005**
Delivery Trucks[5]							
HHDT	Dsl	0.01	1.76	0.07	0.015	0.14	0.06

Notes:

[1] Data obtained from EMFAC2021 for default emissions activity.

[2] Sum of running exhaust, running loss, tire wear, and brake wear emissions obtained from EMFAC2021 for default emissions activity.

[3] For purposes of this analysis VOC is assumed to be equal to ROG.

[4] PM emissions are a sum of exhaust, tire wear, and brake wear.

[5] Delivery trucks are assumed to be diesel-fueled.

[6] Emission factors for EMFAC vehicle classes are estimated as a ratio of the EMFAC emissions output and EMFAC VMT output.

[7] Emission factors for EMFAC vehicle classes are weighted based on the project-specific fleet mix in Table B-2 to estimate trip-based emission factors for passenger vehicles.

Abbreviations:

CAP - criteria air pollutant
CO - carbon monoxide
Dsl - Diesel
EMFAC - EMission FACtors model
LDA - light-duty automobile
LDT - light-duty truck
HHDT - heavy heavy-duty truck
MDV - medium-duty vehicle
NO_x - nitrogen oxide compounds (NO + NO_2)
Phe - Plug-in hybrid
PM - particulate matter
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
PM_{10} - particulate matter less than 10 microns in diameter
ROG - reactive organic gases
SO_x - sulfur oxide compounds
VOC - volatile organic compounds
VMT - vehicle miles traveled

Conversion Factor:

907184.74 grams per ton

Table B-4. Operational Mobile Source CAP Emission Factors - Starting Exhaust, Hot Soak, Diurnal Loss, and Resting Loss
Costco Commercial Center
Fresno, California

EMFAC Vehicle Class	Fuel	EMFAC Vehicle Trips Output[1] (trips/day)	EMFAC Emissions Output[1] (tons/day)								
			VOC[2]				NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
			Starting Exhaust	Hot Soak	Diurnal	Resting Loss	Starting Exhaust				
Passenger Vehicle											
LDA	Gas	1,459,129	0.547	0.156	0.574	0.000	0.428	5.313	0.001	0.004	0.003
LDA	Phe	31,224	0.006	0.001	0.004	0.000	0.004	0.044	0.000	0.000	0.000
LDA	Elec	56,838	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDA	Dsl	3,207	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDT1	Gas	135,565	0.114	0.037	0.154	0.000	0.076	1.087	0.000	0.001	0.001
LDT1	Phe	83	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDT1	Elec	118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDT1	Dsl	62	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDT2	Gas	657,946	0.318	0.073	0.285	0.000	0.281	2.975	0.001	0.002	0.001
LDT2	Phe	3,337	0.001	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000
LDT2	Elec	2,516	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDT2	Dsl	1,661	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MDV	Gas	598,810	0.420	0.084	0.339	0.000	0.358	3.094	0.001	0.002	0.001
MDV	Phe	2,568	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000
MDV	Elec	2,761	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MDV	Dsl	8,640	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Delivery Trucks[3]											
HHDT	Dsl	237,288	0	0	0	0	0.7	0.0	0.0	0.0	0.0

Vehicle Class	Fuel	Starting Exhaust, Hot Soak, Diurnal, and Resting Loss Emission Factors[4] (grams/trip)								
		VOC[2]				NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
		Starting Exhaust	Hot Soak	Diurnal	Resting Loss	Starting Exhaust				
Passenger Vehicles										
LDA	Gas	0.340	0.097	0.357	0.000	0.266	3.303	0.001	0.002	0.002
LDA	Phe	0.167	0.043	0.130	0.000	0.113	1.285	0.001	0.002	0.002
LDA	Elec	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDA	Dsl	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDT1	Gas	0.763	0.251	1.029	0.000	0.512	7.275	0.001	0.004	0.003
LDT1	Phe	0.167	0.025	0.078	0.000	0.113	1.285	0.001	0.002	0.001
LDT1	Elec	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDT1	Dsl	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDT2	Gas	0.438	0.101	0.394	0.000	0.388	4.103	0.001	0.002	0.002
LDT2	Phe	0.167	0.027	0.088	0.000	0.113	1.285	0.001	0.002	0.002
LDT2	Elec	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LDT2	Dsl	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MDV	Gas	0.636	0.128	0.513	0.000	0.543	4.687	0.001	0.002	0.002
MDV	Phe	0.167	0.033	0.108	0.000	0.113	1.285	0.001	0.003	0.002
MDV	Elec	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MDV	Dsl	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Member Vehicle Weighted Emission Factor[5]		**0.433**	**0.111**	**0.427**	**0.000**	**0.351**	**3.901**	**0.001**	**0.002**	**0.002**
Employee Vehicle Emission Factor[5]		**0.423**	**0.108**	**0.417**	**0.000**	**0.342**	**3.804**	**0.001**	**0.002**	**0.002**
Delivery Trucks[3]										
HHDT	Dsl	0	0	0	0	2.8	0	0	0	0

Notes:

[1] Data obtained from EMFAC2021 for default emissions activity.

[2] For purposes of this analysis VOC is assumed to be equal to ROG.

[3] Delivery trucks are assumed to be diesel-fueled.

[4] Emission factors for EMFAC vehicle classes are estimated as a ratio of the EMFAC emissions output and EMFAC trip output.

[5] Emission factors for EMFAC vehicle classes are weighted based on the project-specific fleet mix in Table B-2 to estimate trip-based emission factors for passenger vehicles.

Abbreviations:

CAP - criteria air pollutant
CO - carbon monoxide
Dsl - Diesel
EMFAC - EMission FACtors model
LDA - light-duty automobile
LDT - light-duty truck
HHDT - heavy heavy-duty truck
MDV - medium-duty vehicle
NO_x - nitrogen oxide compounds (NO + NO_2)
Phe - Plug-in hybrid
PM - particulate matter
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
PM_{10} - particulate matter less than 10 microns in diameter
ROG - reactive organic gases
SO_x - sulfur oxide compounds
VOC - volatile organic compounds
VMT - vehicle miles traveled

Conversion Factor:

907184.74 grams per ton

Table B-5. Operational Mobile Source CAP Emission Factors - Idling Exhaust
Costco Commercial Center
Fresno, California

EMFAC Vehicle Class	Fuel	Idling Emission Factors[1] (grams/idle-minute)					
		VOC[2]	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Passenger Vehicles							
LDA	Gas	0.003	0.003	0.059	0.000	0.000	0.000
LDA	Phe	0.001	0.001	0.041	0.000	0.000	0.000
LDA	Elec	0.000	0.000	0.000	0.000	0.000	0.000
LDA	Dsl	0.012	0.012	0.177	0.000	0.004	0.003
LDT1	Gas	0.012	0.015	0.158	0.000	0.001	0.001
LDT1	Phe	0.001	0.000	0.037	0.000	0.000	0.000
LDT1	Elec	0.000	0.000	0.000	0.000	0.000	0.000
LDT1	Dsl	0.049	0.044	0.209	0.000	0.042	0.040
LDT2	Gas	0.004	0.007	0.074	0.000	0.000	0.000
LDT2	Phe	0.001	0.001	0.038	0.000	0.000	0.000
LDT2	Elec	0.000	0.000	0.000	0.000	0.000	0.000
LDT2	Dsl	0.012	0.008	0.104	0.000	0.001	0.001
MDV	Gas	0.006	0.010	0.091	0.000	0.000	0.000
MDV	Phe	0.001	0.001	0.040	0.000	0.000	0.000
MDV	Elec	0.000	0.000	0.000	0.000	0.000	0.000
MDV	Dsl	0.009	0.008	0.174	0.000	0.001	0.001
Member Vehicle Weighted Emission Factor[3]		0.0041	0.0059	0.0730	0.0003	0.0004	0.0004
Employee Vehicle Weighted Emission Factor[3]		0.0040	0.0058	0.0720	0.0003	0.0004	0.0004
Delivery Trucks[4]							
HHDT	Dsl	0.045	0.928	0.628	0.002	0.001	0.001

Notes:

[1] Data obtained from EMFAC2021 project-level output. Passenger vehicle emission rates are equivalent to the running exhaust emission rate in grams per mile at 5 mph, multiplied by the speed correction factor of 2.5 mph.

[2] For purposes of this analysis VOC is assumed to be equal to ROG.

[3] Emission factors for EMFAC vehicle classes are weighted based on the project-specific fleet mix in Table B-2 to estimate trip-based emission factors for passenger vehicles.

[4] Delivery trucks are assumed to be diesel-fueled.

Abbreviations:

CAP - criteria air pollutant
CO - carbon monoxide
EMFAC - EMission FACtors model
LDA - light-duty automobile
LDT - light-duty truck
HHDT - heavy heavy-duty truck
MDV - medium-duty vehicle
mph - miles per hour
NO_x - nitrogen oxide compounds (NO + NO_2)
PM - particulate matter
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
PM_{10} - particulate matter less than 10 microns in diameter
ROG - reactive organic gases
SO_x - sulfur oxide compounds
VOC - volatile organic compounds

Conversion Factor:

60 minutes per hour

Table B-6. Entrained Road Dust Emission Factors for Operational Mobile Sources
Costco Commercial Center
Fresno, California

Vehicle Type	Entrained Road Dust Emission Factor[1] (ton/VMT)	
	PM_{10}	$PM_{2.5}$
Member/Employee Vehicles	3.31E-07	8.11E-08
Delivery Trucks		

Notes:

[1] Emission factor calculated following guidance in the CalEEMod® User's Guide, Appendix A, which is based on AP-42, Section 13.2.1 for vehicles traveling on paved roads. The equation is:

$EF = k \times (sL)^{0.91} \times (W)^{1.02}$, where:

0.0022 = k_{PM10} (lb/VMT), PM_{10} particle size multiplier

0.00054 = $k_{PM2.5}$ (lb/VMT), $PM_{2.5}$ particle size multiplier

0.1 = sL (g/m^2), silt loading (CalEEMod Default)

2.4 = W (tons), mean vehicle weight (CalEEMod Default)

[3] Assumes 100% of on-road travel occurs on paved roads.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

EF - emission factor

lb - pounds

PM_{10} - particulate matter less than 10 microns in aerodynamic diameter

$PM_{2.5}$ - particulate matter less than 2.5 microns in aerodynamic diameter

VMT - vehicle miles traveled

Table B-7a. Annual Criteria Air Pollutant Emission Estimates for Operational Mobile Sources (Herndon/Riverside)
Costco Commercial Center
Fresno, California

Mobile Source Activity	Trip Type	Trip Distance[1] (miles)	Annual Average Trips[1] (one-way trips/year)	Annual Average VMT[1] (miles/year)	Idle Duration[2,3] (minutes/year)	Criteria Air Pollutant Emissions (tons/year)					
						VOC[4]	NO_x[5]	CO[5]	SO_x[5]	PM_{10}[6]	$PM_{2.5}$[6]
Member Vehicles	Primary[7]	17.3	3,666,790	63,337,720	--	7.44	6.69	83.29	0.23	22.04	5.53
	Diverted[8]	1.0	1,473,870	1,503,435	--	0.97	0.69	7.94	0.01	0.53	0.13
	Pass-By[8]	0.10	1,382,620	138,262	--	0.84	0.55	6.09	0.00	0.05	0.02
Warehouse, Fuel Station, and Car Wash Employee Vehicles	Primary[7]	30.7	109,500	3,361,650	--	0.30	0.32	3.96	0.01	1.17	0.29
MDO Driver and Warehouse Employee Vehicles	Primary[7]	30.70	49,640	1,523,875	--	0.13	0.14	1.79	0.01	0.53	0.13
MDO Delivery Trucks	Primary[7]	81.5	7,300	594,950	18,250	0.01	1.20	0.06	0.01	0.29	0.09
Fuel Delivery Trucks	Primary[7]	125.0	5,110	638,750	12,775	0.01	1.27	0.06	0.01	0.31	0.10
Warehouse Delivery Trucks	Primary[7]	125.0	9,490	1,186,250	23,725	0.02	2.36	0.11	0.02	0.58	0.18
GDF Vehicle Idling		--	--	--	33,638,400	0.15	0.22	2.71	0.01	0.02	0.01
					Total Emissions	9.9	13.4	106.0	0.3	25.5	6.5

Notes

[1] Data obtained from Table B-1a.

[2] Idle duration for passenger vehicles visiting the gas station is estimated using a maximum queue length of 3 vehicles per queue lane and a transaction time of 4 minutes per vehicle. The queue is assumed to stay constant while the gas station is open (6 AM to 10 PM), 7 days/week. Queue length is based on Saturday midday peak hour average queue length projections from existing Costco facilities provided by Kittelson & Associates.

[3] Delivery truck idle duration is 5 minutes based on the CARB Air Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling. Available at: https://ww2.arb.ca.gov/our-work/programs/atcm-to-limit-vehicle-idling/about. Accessed: September 2021. For GDF idling this is actually idling duration in units of minutes per year.

[4] VOC emissions include running exhaust, running loss, hot soak, diurnal, resting loss, starting exhaust, and idling exhaust. Emissions were estimated using emission factors from Tables B-3, B-4, and B-5 along with annual VMT, annual trips, and idle duration.

[5] NO_X, CO, and SO_X emissions include running exhaust, starting exhaust, and idling exhaust. Emissions were estimated using emission factors from Tables B-3, B-4, and B-5 along with annual VMT, annual trips, and idle duration.

[6] PM_{10} and $PM_{2.5}$ emissions include running exhaust, tire wear, brake wear, fugitive dust, starting exhaust, and idling exhaust. Emissions were estimated using emission factors from Tables B-3, B-4, B-5, and B-6 along with annual VMT, annual trips, and idle duration.

[7] Primary trip emissions include travel emissions (running exhaust, running loss, tire wear, brake wear, and fugitive dust), evaporative emissions (hot soak, diurnal, and resting loss), and starting exhaust emissions.

[8] Pass-by and Diverted trip emissions include travel emissions (running exhaust, running loss, tire wear, brake wear, and fugitive dust) and hot soak evaporative emissions, and starting exhaust emissions.

Abbreviations:

CO - carbon monoxide
lb - pounds
NO - nitrogen monoxide
NO_2 - nitrogen dioxide
NO_x - nitrogen oxide compounds (NO + NO_2)
PM - particulate matter
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
PM_{10} - particulate matter less than 10 microns in diameter
SOx - sulfur oxide compounds
VOC - Volatile Organic Compound

Table B-7b. Annual Criteria Air Pollutant Emission Estimates for Operational Mobile Sources (4500 W. Shaw Avenue)
Costco Commercial Center
Fresno, California

Mobile Source Activity	Trip Type	Annual Average Trips[1] (one-way trips/year)	Annual Average VMT[1] (miles/year)	Criteria Air Pollutant Emissions (tons/year)					
				VOC[2]	NO_x[3]	CO[3]	SO_x[3]	PM_{10}[4]	$PM_{2.5}$[4]
Passenger Vehicles	Primary[5]	497,495	21,266,360	1.71	1.96	24.81	0.08	7.40	1.85
	Pass-by[6]	17,520	0	0.01	0.00	0.04	0.00	0.00	0.00
	Diverted[6]	766,135	1,256,330	0.30	0.25	2.99	0.00	0.44	0.11
Total Emissions				**1.7**	**2.0**	**24.8**	**0.1**	**7.4**	**1.9**

Notes

[1] Data obtained from Table B-1b.

[2] VOC emissions include running exhaust, running loss, hot soak, diurnal, resting loss, starting exhaust, and idling exhaust. Emissions were estimated using emission factors from Tables B-3, B-4, and B-5 along with annual VMT, annual trips, and idle duration.

[3] NO_X, CO, and SO_X emissions include running exhaust, starting exhaust, and idling exhaust. Emissions were estimated using emission factors from Tables B-3, B-4, and B-5 along with annual VMT, annual trips, and idle duration.

[4] PM_{10} and $PM_{2.5}$ emissions include running exhaust, tire wear, brake wear, fugitive dust, starting exhaust, and idling exhaust. Emissions were estimated using emission factors from Tables B-3, B-4, B-5, and B-6 along with annual VMT, annual trips, and idle duration.

[5] Primary trip emissions include travel emissions (running exhaust, running loss, tire wear, brake wear, and fugitive dust), evaporative emissions (hot soak, diurnal, and resting loss), and starting exhaust emissions.

[6] Pass-by and diverted emissions include travel emissions (running exhaust, running loss, tire wear, brake wear, and fugitive dust) and evaporative emissions (hot soak), and starting exhaust emissions based on the number of round trips (i.e., half of one-way trips).

Abbreviations:

CO - carbon monoxide
lb - pounds
NO - nitrogen monoxide
NO_2 - nitrogen dioxide
NO_x - nitrogen oxide compounds (NO + NO_2)
PM - particulate matter
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
PM_{10} - particulate matter less than 10 microns in diameter
SOx - sulfur oxide compounds
VOC - Volatile Organic Compound

APPENDIX C
CONSTRUCTION HEALTH RISK ASSESSMENT EMISSION CALCULATIONS

Table C-1. Off-Road Equipment DPM Emissions
Costco Commercial Center
Fresno, California

Year	Phase	Phase Duration[1] (days)	Emission Source Category[1]	Mitigated PM_{10} Emissions[1] (tons/year)
2023	Demolition	7	Off-Road	4.50E-04
2023	Site Preparation	7	Off-Road	2.60E-04
2023	Grading	30	Off-Road	5.62E-03
2023	Grading/BC Overlap	20	Off-Road	2.18E-03
2023	Building Construction	110	Off-Road	1.16E-02
2023	Paving	40	Off-Road	2.06E-03
2023	Architectural Coating	50	Off-Road	3.60E-04

Notes:
[1] Unmitigated PM_{10} emissions are estimated using CalEEMod® default construction assumptions.

Abbreviations:
CalEEMod® - California Emissions Estimator Model
PM_{10} - particulate matter less than 10 microns in diameter

Table C-2. Vendor and Haul Truck DPM Emissions
Costco Commercial Center
Fresno, California

Modeled Roadway Links[1]		Source Group ID	Percent of Incoming Trips[2]	Percent of Outgoing Trips[2]	Total Annual Hauling Truck Trips[3] (one-way trips/year)	Segment Length[4] (miles)	Segment Length (miles)	Annual VMT[5] (miles/year)	DPM Emissions[6] (lbs/year)
Hauling Truck Routes	Herndon Ave (west of Riverside Drive)	OFFTRV1	100%	100%	7,877	389.3	0.24	1,905.44	1.12E-01
	Riverside Dr (Between Entry D and Herndon Ave)	OFFTRV2	100%	0%	3,939	132.9	0.08	325.24	1.92E-02
	Riverside Dr (Between Entry C and Entry D)	OFFTRV3	100%	0%	3,939	99.0	0.06	242.28	1.43E-02
	Riverside Dr (Between Entry B and Entry C)	OFFTRV4	100%	0%	3,939	93.0	0.06	227.60	1.34E-02
	Arthur Ave (Between Entry E and Herndon Ave)	OFFTRV5	0%	100%	3,939	53.8	0.03	131.66	7.77E-03
	Herndon Ave (Between Riverside Dr and Arthur Ave)	OFFTRV6	0%	100%	3,939	272.5	0.17	666.88	3.94E-02
	Arthur Ave (Between Entry E and Entry F)	OFFTRV7	0%	100%	3,939	292.9	0.18	716.81	4.23E-02
Vendor Truck Routes	Herndon Ave (west of Riverside Drive)	OFFTRV1	100%	100%	99.0	389.3	0.24	23.95	9.26E-04
	Riverside Dr (Between Entry D and Herndon Ave)	OFFTRV2	100%	0%	49.5	132.9	0.08	4.09	1.58E-04
	Riverside Dr (Between Entry C and Entry D)	OFFTRV3	100%	0%	49.5	99.0	0.06	3.05	1.18E-04
	Riverside Dr (Between Entry B and Entry C)	OFFTRV4	100%	0%	49.5	93.0	0.06	2.86	1.11E-04
	Arthur Ave (Between Entry E and Herndon Ave)	OFFTRV5	0%	100%	49.5	53.8	0.03	1.65	6.40E-05
	Herndon Ave (Between Riverside Dr and Arthur Ave)	OFFTRV6	0%	100%	49.5	272.5	0.17	8.38	3.24E-04
	Arthur Ave (Between Entry E and Entry F)	OFFTRV7	0%	100%	49.5	292.9	0.18	9.01	3.48E-04

Notes:

[1] See Figure 1 for a graphic representation of the modeled sources.

[2] A roadway link was conservatively assumed to experience 100% of incoming and outgoing trips if it could experience any percentage of trips.

[3] Total annual one-way trips are calculated as the sum of inbound and outbound one-way trips. Annual one-way haul truck and vendor truck trips per construction phase are estimated using CalEEMod®.

[4] Segment length based on modeled source length in AERMOD.

[5] Annual VMT is calculated as the product of segment length and total annual one-way trips.

[6] DPM emissions are calculated as the product of annual VMT and PM_{10} emission factor per vehicle type. For purposes of this analysis, DPM emissions are assumed to be equal to PM_{10} exhaust emissions from diesel vehicles.

Abbreviations:

AERMOD - American Meteorological Society/Environmental Protection Agency Regulatory Model
CalEEMod® - California Emissions Estimator Model
DPM - diesel particulate matter
lbs - pounds
m - meters
PM_{10} - particulate matter less than 10 microns in diameter
VMT - vehicle miles travelled

APPENDIX D
OPERATIONAL HEALTH RISK ASSESSMENT EMISSION CALCULATIONS

Table D-1. Traffic Volumes and Vehicle Miles Traveled on Modeled Roadways
Costco Commercial Center
Fresno, California

Modeled Roadway Links[1]		Source Group ID	Total Annual Trip Rates[2] (one-way trips/year)	Segment Length[3] (meters)	Segment Length (miles)	Annual VMT[4] (miles/year)
Fuel Delivery Trucks	Herndon Ave (west of Riverside Drive)	FT_TRV1	10,220	389.3	0.24	2,472
	Riverside Dr (Between Entry D and Herndon Ave)	FT_TRV2	10,220	132.9	0.08	844
	Riverside Dr (Between Entry C and Entry D)	FT_TRV3	10,220	99.0	0.06	629
	Riverside Dr (Between Entry B and Entry C)	FT_TRV4	10,220	93.0	0.06	591
	Riverside Dr (Between Spruce Ave and Entry B)	FT_TRV5	10,220	48.7	0.03	309
	Spruce Ave (Between Riverside Drive and Entry A)	FT_TRV6	10,220	57.5	0.04	365
	Spruce Ave (Between Entry A and Arthur Ave)	FT_TRV7	5,110	215.3	0.13	684
	Arthur Ave (Between Spruce Ave and Entry F)	FT_TRV8	5,110	62.9	0.04	200
	Entry F	FT_TRV9	5,110	216.8	0.13	688
	Entry A	FT_TRV10	5,110	53.2	0.03	169
	On-Site Idling	FT_IDLE	5,110	--	--	--
Warehouse Delivery Trucks	Herndon Ave (west of Riverside Drive)	WT_TRV1	18,980	389.3	0.24	4,591
	Riverside Dr (Between Entry D and Herndon Ave)	WT_TRV2	9,490	132.9	0.08	784
	Entry D	WT_TRV3	9,490	247.1	0.15	1,457
	Entry E	WT_TRV4	9,490	126.1	0.08	744
	Arthur Ave (Between Entry E and Herndon Ave)	WT_TRV5	9,490	53.8	0.03	317
	Herndon Ave (Between Riverside Dr and Arthur Ave)	WT_TRV6	9,490	272.5	0.17	1,607
	On-Site Idling	WT_IDLE1	4,745	--	--	--
	On-Site Idling	WT_IDLE2	4,745	--	--	--
MDO Delivery Trucks	Herndon Ave (west of Riverside Drive)	MD_TRV1	8,343	389.3	0.24	2,018
	Riverside Dr (Between Entry D and Herndon Ave)	MD_TRV2	6,257	132.9	0.08	517
	Riverside Dr (Between Entry C and Entry D)	MD_TRV3	2,607	99.0	0.06	160
	Entry D	MD_TRV4	6,779	247.1	0.15	1,041
	Riverside Dr (Between Entry B and Entry C)	MD_TRV5	2,607	93.0	0.06	151
	Entry E	MD_TRV6	7,821	126.1	0.08	613
	Riverside Dr (Between Spruce Ave and Entry B)	MD_TRV7	2,607	48.7	0.03	79
	Arthur Ave (Between Entry E and Herndon Ave)	MD_TRV8	6,257	53.8	0.03	209
	Spruce Ave (Between Entry A and Arthur Ave)	MD_TRV9	1,564	215.3	0.13	209
	Herndon Ave (Between Riverside Dr and Arthur Ave)	MD_TRV10	6,257	272.5	0.17	1,059
	Spruce Ave (Between Riverside Drive and Entry A)	MD_TRV11	1,564	57.5	0.04	56
	Arthur Ave (Between Spruce Ave and Entry F)	MD_TRV12	1,564	62.9	0.04	61
	Spruce Ave (west of Riverside Drive)	MD_TRV13	1,564	393.2	0.24	382
	Riverside Drive (North of Spruce Ave)	MD_TRV14	1,564	395.9	0.25	385

Table D-1. Traffic Volumes and Vehicle Miles Traveled on Modeled Roadways
Costco Commercial Center
Fresno, California

Modeled Roadway Links[1]		Source Group ID	Total Annual Trip Rates[2] (one-way trips/year)	Segment Length[3] (meters)	Segment Length (miles)	Annual VMT[4] (miles/year)
MDO Delivery Trucks *(Continued)*	Spruce Ave (East of Arthur Ave)	MD_TRV15	1,043	398.2	0.25	258
	Riverside Dr (South of Herndon Ave)	MD_TRV16	1,043	463.4	0.29	300
	Herndon Ave (East of Arthur Ave)	MD_TRV17	1,043	396.3	0.25	257
	Arthur Ave (Between Entry E and Entry F)	MD_TRV18	1,564	292.9	0.18	285
	On-Site Idling	MD_IDLE1	7,300	--	--	--
	On-Site Idling	MD_IDLE2	7,300	--	--	--

Notes:

[1] See Figure 2 for a graphic representation of the modeled sources.

[2] Trip rates based Project-specific data provided by Kittelson & Associates. The delivery truck trip rates assume the following for each truck category:

Fuel delivery trucks: 14 trucks per day
Warehouse delivery trucks: 26 trucks per day
MDO delivery trucks: 20 trucks per day

[3] Segment length based on modeled source length in AERMOD.

[4] VMT is calculated as the product of the segment length and the total number of annual one-way trips.

Abbreviations:

AERMOD - American Meteorological Society/Environmental Protection Agency Regulatory Model
VMT - vehicle miles traveled
MDO - Market delivery operation

Table D-2. Diesel Particulate Matter Emission Factors
Costco Commercial Center
Fresno, California

EMFAC Vehicle Class	EMFAC VMT Output[1] (miles/day)	DPM Emission Factor[2]		
		Off-site Running Exhaust[3] (g/mile)	On-site Running Exhaust[4] (g/mile)	Idle Exhaust (g/idle-minute)
Fuel Delivery, Warehouse Delivery, and MDO Delivery Trucks				
HHDT	2,030,441	0.029	0.012	0.0002

Notes:

[1] Data obtained from EMFAC2021 output for HHDT diesel vehicle default emissions activity.

[2] For purposes of this analysis, DPM emissions are assumed to be equal to PM_{10} exhaust emissions from diesel vehicles.

[3] Off-site running exhaust emission factor is based on EMFAC2021 default activity output for aggregated speeds.

[4] On-site running exhaust emission factor is based on EMFAC2021 project-level emission rate output for a speed of 5 mph.

Conversion Factors:

60 min/hr
907,185 g/ton

Abbreviations:

DPM - diesel particulate matter
EMFAC - EMission FACtors model
HHDT - Heavy heavy-duty truck
g - grams
hr - hours
min - minutes
mph - miles per hour
PM_{10} - particulate matter less than 10 microns in diameter
VMT - vehicle miles travelled

Table D-3. Delivery Truck Emissions
Costco Commercial Center
Fresno, California

Source Group ID[1]	Modeled Roadway Link	Project VMT[2] (miles)	Project Trips[2] (one-way trips)	Idle Duration (minutes/round trip)	DPM Exhaust Emissions[3,4]
		Annual	Annual		Annual (lb/year)
FT_TRV1	Herndon Ave (West of Riverside Drive)	2,472	10,220	--	1.60E-01
FT_TRV2	Riverside Dr (Between Entry D and Herndon Ave)	844	10,220	--	5.45E-02
FT_TRV3	Riverside Dr (Between Entry C and Entry D)	629	10,220	--	4.06E-02
FT_TRV4	Riverside Dr (Between Entry B and Entry C)	591	10,220	--	3.82E-02
FT_TRV5	Riverside Dr (Between Spruce Ave and Entry B)	309	10,220	--	2.00E-02
FT_TRV6	Spruce Ave (Between Riverside Drive and Entry A)	365	10,220	--	2.36E-02
FT_TRV7	Spruce Ave (Between Entry A and Arthur Ave)	684	5,110	--	4.42E-02
FT_TRV8	Arthur Ave (Between Spruce Ave and Entry F)	200	5,110	--	1.29E-02
FT_TRV9	Entry F	688	5,110	--	1.89E-02
FT_TRV10	Entry A	169	5,110	--	4.63E-03
FT_IDLE	On-Site Idling	--	5,110	5	1.17E-02
WT_TRV1	Herndon Ave (West of Riverside Drive)	4,591	18,980	--	2.97E-01
WT_TRV2	Riverside Dr (Between Entry D and Herndon Ave)	784	9,490	--	5.06E-02
WT_TRV3	Entry D	1,457	9,490	--	4.00E-02
WT_TRV4	Entry E	744	9,490	--	2.04E-02
WT_TRV5	Arthur Ave (Between Entry E and Herndon Ave)	317	9,490	--	2.05E-02
WT_TRV6	Herndon Ave (Between Riverside Dr and Arthur Ave)	1,607	9,490	--	1.04E-01
WT_IDLE1	On-Site Idling	--	4,745	5	5.43E-03
WT_IDLE2	On-Site Idling	--	4,745	5	5.43E-03
MD_TRV1	Herndon Ave (West of Riverside Drive)	2,018	8,343	--	1.30E-01
MD_TRV2	Riverside Dr (Between Entry D and Herndon Ave)	517	6,257	--	3.34E-02
MD_TRV3	Riverside Dr (Between Entry C and Entry D)	160	2,607	--	1.04E-02
MD_TRV4	Entry D	1,041	6,779	--	6.73E-02
MD_TRV5	Riverside Dr (Between Entry B and Entry C)	151	2,607	--	9.74E-03
MD_TRV6	Entry E	613	7,821	--	3.96E-02
MD_TRV7	Riverside Dr (Between Spruce Ave and Entry B)	79	2,607	--	5.10E-03
MD_TRV8	Arthur Ave (Between Entry E and Herndon Ave)	209	6,257	--	1.35E-02
MD_TRV9	Spruce Ave (Between Entry A and Arthur Ave)	209	1,564	--	1.35E-02
MD_TRV10	Herndon Ave (Between Riverside Dr and Arthur Ave)	1,059	6,257	--	6.85E-02
MD_TRV11	Spruce Ave (Between Riverside Drive and Entry A)	56	1,564	--	3.61E-03
MD_TRV12	Arthur Ave (Between Spruce Ave and Entry F)	61	1,564	--	3.95E-03
MD_TRV13	Spruce Ave (West of Riverside Drive)	382	1,564	--	2.47E-02
MD_TRV14	Riverside Drive (North of Spruce Ave)	385	1,564	--	2.49E-02

Table D-3. Delivery Truck Emissions
Costco Commercial Center
Fresno, California

Source Group ID[1]	Modeled Roadway Link	Project VMT[2] (miles)	Project Trips[2] (one-way trips)	Idle Duration (minutes/round trip)	DPM Exhaust Emissions[3,4]
		Annual	Annual		Annual (lb/year)
MD_TRV15	Spruce Ave (East of Arthur Ave)	258	1,043	--	1.67E-02
MD_TRV16	Riverside Dr (South of Herndon Ave)	300	1,043	--	1.94E-02
MD_TRV17	Herndon Ave (East of Arthur Ave)	257	1,043	--	1.66E-02
MD_TRV18	Arthur Ave (Between Entry E and Entry F)	285	1,564	--	1.84E-02
MD_IDLE1	On-Site Idling	--	7,300	5	8.36E-03
MD_IDLE2	On-Site Idling	--	7,300	5	8.36E-03

Notes:

[1] See Figure 2 for a graphic representation of the modeled sources.

[2] Data was obtained from Table D-1.

[3] DPM running exhaust emissions were calculated using the emission factors from Table D-2 along with Project VMT and trips.

[4] DPM emissions for on-site vehicle idling were estimated using the number of round trips (i.e., half of the one-way trips) and DPM idling exhaust emission factor from Table D-2.

Conversion Factor:

453.59 g/lb

Abbreviations:

CalEEMod® - CALifornia Emissions Estimator MODel
DPM - diesel particulate matter
g - grams
lb - pounds
VMT - vehicle miles traveled

Table D-4. Gasoline Transfer and Dispensing Emissions
Costco Commercial Center
Fresno, California

		Source Group ID					
		LOADING	BREATH	REFILL			SPILL
		Loading	Breathing	Refueling	Hose Permeation	Total	Spillage
VOC Emission Factor (lb/1,000 gallons)		0.15	0.024	0.356	0.009	--	0.24
Weight Percent	Benzene	0.30%	0.30%	0.30%	0.30%	--	1.00%
	Ethyl Benzene	1.60%	1.60%	1.60%	1.60%	--	1.60%
	Toluene	8.0%	8.0%	8.0%	8.0%	--	8.0%
	Xylene	2.4%	2.4%	2.4%	2.4%	--	2.4%
Emissions (lb/hr)	Benzene	0.0022	0.0003	0.0051	0.0001	0.0053	0.0115
	Ethyl Benzene	0.0115	0.0018	0.0273	0.0007	0.0280	0.0184
	Toluene	0.0576	0.0092	0.1367	0.0035	0.1402	0.0922
	Xylene	0.0173	0.0028	0.0410	0.0010	0.0420	0.0276
Emissions (lb/year)	Benzene	11.48	1.84	27.23	0.69	27.92	61.20
	Ethyl Benzene	61.20	9.79	145.25	3.67	148.92	97.92
	Toluene	306.00	48.96	726.24	18.36	744.60	489.60
	Xylene	91.80	14.69	217.87	5.51	223.38	146.88

Throughput:

Maximum Hourly	4,800 gallons/hr
Annual	25.5 million gallons/year

Notes:

[1] Emission factors and speciation obtained from SJVAPCD and CAPCOA 1997 Gasoline Service Station Industrywide Risk Assessment Technical Guidance. Available at: https://ww2.arb.ca.gov/sites/default/files/classic//ab2588/rrap-iwra/gasiwra.pdf and https://www.valleyair.org/busind/pto/AB-2588-Toxics-Profiles.docx. Accessed: October 2021.

[2] Maximum hourly throughput is based on a maximum of 15 vehicles per dispensing position per hour, with an average fill up of 10 gallons per vehicle.

Abbreviations:

CAPCOA - California Air Pollution Control Officers Association
CARB - California Air Resources Board
hr - hour
lb - pounds
SJVAPCD - San Joaquin Valley Air Pollution Control District
VOC - volatile organic compounds

Table D-5. TRU Emission Calculations
Costco Commercial Center
Fresno, California

Emission Factor[1,2] (g/bhp-hr)	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	2.52	2.12	0.32	0.002	0.06	0.06

Number of Trips with TRUs[3]	712

Modeled Roadway Link	Annual VMT (miles/year)	Annual Average TRU Emissions (lb/year)					
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
TRU_1	4,591	16.17	13.56	2.03	0.01	0.38	0.35
TRU_2	784	2.76	2.32	0.35	0.00	0.07	0.06
TRU_3	1,457	30.79	25.83	3.87	0.02	0.73	0.67
TRU_4	744	15.71	13.18	1.97	0.01	0.37	0.34
TRU_5	317	1.12	0.94	0.14	0.00	0.03	0.02
TRU_6	1,607	5.66	4.75	0.71	0.00	0.13	0.12

Notes:

[1] Emission factors obtained from OFFROAD2021 emissions output for Calendar Year 2023, Transportation Refrigeration Unit - Instate Trailer and Transportation Refrigeration Unit - Out-Of-State Trailer in Fresno County.

[2] SO_X emission factors based on sulfur content of ultra-low sulfur diesel fuel (15 ppm) and fuel consumption from OFFROAD2021.

[3] Approximately 15% of warehouse delivery trucks are equipped with TRUs.

[4] Horsepower is based on SJVAPCD Guidance for Air Dispersion Modeling, section 2.3.1 Transportation Refrigeration unit (TRU), Modeling Parameters.

[5] Load factor obtained from CARB Draft 2019 Update to Emissions Inventory for Transport Refrigeration Units, for TRUs Over 25 hp, 2013 and newer. Available at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/cold-storage/documents/hra_emissioninventory2019.pdf. Accessed: January 2022.

[6] It is assumed that TRUs will be powered by electric plug-ins at each loading dock during delivieries to the warehouse. Therefore, zero emissions are estimated to occur from TRUs at the loading docks due to zero minutes of TRU idling duration.

[7] TRU On-Road Duration is based on the segment length and travel speed for each roadway. On-site travel speed is assumed to be 5 miles per hour, and off-site travel speed is assumed to be 30 miles per hour. Assumptions are based on Table II.G.1 of CARB Proposed Amendments to the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate. Available at: https://ww2.arb.ca.gov/sites/default/files/barcu/board/rulemaking/tru2021/appi.pdf. Accessed: July 2022.

Constants:

Horsepower [4]	50	bhp
Load Factor [5]	0.38	
TRU Idling Duration [6]	0	min
On-Site Travel [7]	5	miles/hr
Off-Site Travel [7]	30	miles/hr
Fuel Consumption[2]	0.04	gal/hp-hr
Fuel Sulfur Content[2]	15	ppm
Density of Diesel	3,221	g/gal

Conversion Factors:

453.59	g/lb
1,000,000	g/MT
60	min/hr
365	day/year
2,000	lb/ton

Abbreviations:

bph - brake horsepower
CARB - California Air Resources Board
CO - carbon monoxide
g - grams
gal - gallon
hp - horsepower
hr - hour
lb - pounds
min - minutes
NO_x - oxides of nitrogen
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
SJVAPCD - San Joaquin Valley Air Pollution Control District
SO_x - oxides of sulfur
TRU - transport/transportation refrigeration unit
VOC - volatile organic compounds

APPENDIX E
AERMOD INPUTS

Table E-1. Modeled Source Parameters - Point Sources
Costco Commercial Center
Fresno, California

Source Type	Model ID	Description	Stack Height[1] (m)	Stack Temperature[1] (K)	Exit Velocity[1] (m/s)	Stack Diameter[1] (m)	Emission Rate (g/s)
Point	LOADING	GDF loading emissions	3.66	291.00	0.00035	0.0508	1
Point	BREATH	GDF breathing emissions	3.66	288.71	0.000106	0.0508	1
Point	FT_IDLE	Fuel Delivery Truck Idling	3.84	366.0	51.71	0.100	1
Point	WT_IDLE_EAST	Warehouse Delivery Truck Idling	3.84	366.0	51.71	0.100	1
Point	WT_IDLE_WEST	Warehouse Delivery Truck Idling	3.84	366.0	51.71	0.100	1
Point	MD_IDLE_EAST	MDO Delivery Truck Idling	0.18	366.0	0.001	0.100	1
Point	MD_IDLE_WEST	MDO Delivery Truck Idling	0.18	366.0	0.001	0.100	1

Notes:

[1] Point source parameters are based on SJVAPCD Guidance for Air Dispersion Modeling. Available at: https://www.valleyair.org/busind/pto/Tox_Resources/Modeling%20Guidance.pdf. Accessed: October 2021.

Abbreviations:

gal - gallons
GDF - gasoline dispensing facility
g - gram
K - Kelvin
m - meters
SJVAPCD - San Joaquin Valley Air Pollution Control District
s - second
TRU - transportation refrigeration unit
yr - year

Table E-2. Modeled Source Parameters - Volume Sources
Costco Commercial Center
Fresno, California

Source Type	Model ID	Description	Release Height[1,2] (m)	Initial Lateral Dimension, Sigma Y[3,4] (m)	Initial Vertical Dimension, Sigma Z[1,2] (m)	Emission Rate[5] (g/s)
Volume	REFILL	Refueling and Hose Permeation	4.0	8.79	1.86	1.0
Volume	SPILL	Spillage	4.0	8.79	1.86	1.0
Volume	VOL_1 through VOL_241	On-Site Construction Equipment	5.0	9.30	1.40	1.0

Notes:

[1] Release height and Sigma Z for refueling, hose permeation, and spillage are based on SJVAPCD Guidance for Air Dispersion Modeling.

[2] Release height and Sigma Z for on-site construction equipment are based on SCAQMD Localized Significance Threshold Methodology.

[3] Initial lateral dimension for refueling, hose permeation, and spillage are based on the dimensions of the GDF canopy and calculated using USEPA AERMOD Guidance.

[4] Initial lateral dimension for on-site construction equipment is based on 20 meters of a volume source length of side provided in SCAQMD Localized Significance Threshold Methodology and calculated using USEPA AERMOD Guidance.

[5] Emission rate for on-site construction equipment represents the sum of all volume source emission rates.

Abbreviations:

g - gram
GDF - gasoline dispensing facility
m - meters
SCAQMD - South Coast Air Quality Management District
SJVAPCD - San Joaquin Valley Air Pollution Control District
s - second
USEPA - United States Environmental Protection Agency

References:

SCAQMD. 2008. Localized Significance Threshold Methodology. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2. Accessed: January 2022.

SJVAPCD. 2006. Guidance for Air Dispersion Modeling. Available at: https://www.valleyair.org/busind/pto/Tox_Resources/Modeling%20Guidance.pdf. Accessed: October 2021.

USEPA. 2015. Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas Appendices. November. Available at: https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockey=P100NN22.pdf. Accessed: May 2021.

Table E-3. Modeled Source Parameters - Mobile Sources
Costco Commercial Center
Fresno, California

Source Type	Model ID	Description	Plume Width[1] (m)	Plume Height[2,3] (m)	Release Height[4,5] (m)
Line-Volume	FT_TRV1 through FT_TRV10	Fuel Delivery Truck Travel	3.66	6.80	3.40
Line-Volume	WT_TRV1 through WT_TRV6	Warehouse Delivery Truck Travel	3.66	6.80	3.40
Line-Volume	MD_TRV1 through MD_TRV18	MDO Truck Travel	3.66	3.84	1.83
Line-Volume	OFFTRV1 through OFFTRV7	Construction-Related Vendor and Hauling Truck Travel	3.66	6.80	3.40

Notes:

[1] Plume width is equal to SJVAPCD recommended value of 12 feet for truck width. Diana Walker (SJVAPCD) confirmed this value on October 7, 2021.

[2] The plume height for fuel delivery, warehouse delivery, and construction-related trucks is assumed to be equal to 1.7 times the vehicle height. Vehicle height is based on the USEPA Transportation Conformity Guidance.

[3] The plume height for MDO delivery trucks is equal to SJVAPCD recommended value of 12.6 feet for truck height. This plume height is lower than the plume heights for other trucks to capture the low-level placement of the MDO delivery trucks' tailpipe exhausts.

[4] Release height for fuel delivery, warehouse delivery, and construction-related trucks is estimated as half of the initial vertical dimension based on the USEPA Transportation Conformity Guidance.

[5] Release height for MDO delivery trucks is equal to SJVAPCD recommended value of 6 feet for truck height. This release height is lower than the release heights for other trucks to capture the low-level placement of the MDO delivery trucks' tailpipe exhausts.

Abbreviations:

m - meters

MDO - market delivery operation

SJVAPCD - San Joaquin Valley Air Pollution Control District

USEPA - United States Environmental Protection Agency

References:

SJVAPCD. 2006. Guidance for Air Dispersion Modeling. Available at: https://www.valleyair.org/busind/pto/Tox_Resources/Modeling%20Guidance.pdf. Accessed: October 2021.

USEPA. 2015. Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas Appendices. November. Available at: https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockey=P100NN22.pdf. Accessed: May 2021.

APPENDIX F
HARP2 OUTPUTS

Table F-1. Construction Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
1	240425.00	4080650.00	Worker	0.13	5.58E-03	0.00E+00
3	240475.00	4080650.00	Worker	0.16	6.73E-03	0.00E+00
4	240500.00	4080650.00	Worker	0.18	7.51E-03	0.00E+00
13	240725.00	4080650.00	Worker	0.34	1.42E-02	0.00E+00
14	240750.00	4080650.00	Worker	0.34	1.40E-02	0.00E+00
15	240400.00	4080675.00	Worker	0.15	6.08E-03	0.00E+00
16	240425.00	4080675.00	Worker	0.16	6.73E-03	0.00E+00
18	240475.00	4080675.00	Worker	0.20	8.49E-03	0.00E+00
19	240500.00	4080675.00	Worker	0.24	9.79E-03	0.00E+00
28	240725.00	4080675.00	Worker	0.43	1.78E-02	0.00E+00
29	240750.00	4080675.00	Worker	0.41	1.70E-02	0.00E+00
30	240775.00	4080675.00	Worker	0.38	1.56E-02	0.00E+00
32	240400.00	4080700.00	Worker	0.18	7.26E-03	0.00E+00
33	240425.00	4080700.00	Worker	0.20	8.27E-03	0.00E+00
35	240475.00	4080700.00	Worker	0.27	1.12E-02	0.00E+00
36	240500.00	4080700.00	Worker	0.33	1.38E-02	0.00E+00
67	240375.00	4080750.00	Residential	7.00	8.52E-03	0.00E+00
75	240375.00	4080775.00	Residential	7.94	9.67E-03	0.00E+00
76	240400.00	4080775.00	Residential	9.64	1.17E-02	0.00E+00
77	240425.00	4080775.00	Residential	12.21	1.49E-02	0.00E+00
83	240375.00	4080800.00	Residential	8.87	1.08E-02	0.00E+00
84	240400.00	4080800.00	Residential	10.96	1.34E-02	0.00E+00
85	240425.00	4080800.00	Residential	14.21	1.73E-02	0.00E+00
91	240375.00	4080825.00	Residential	9.71	1.18E-02	0.00E+00
92	240400.00	4080825.00	Residential	12.15	1.48E-02	0.00E+00
93	240425.00	4080825.00	Residential	15.93	1.94E-02	0.00E+00
99	240375.00	4080850.00	Residential	10.39	1.26E-02	0.00E+00
100	240400.00	4080850.00	Residential	13.02	1.58E-02	0.00E+00
101	240425.00	4080850.00	Residential	16.99	2.07E-02	0.00E+00
108	240400.00	4080875.00	Residential	13.59	1.65E-02	0.00E+00
109	240425.00	4080875.00	Residential	17.62	2.15E-02	0.00E+00
115	240375.00	4080900.00	Residential	11.17	1.36E-02	0.00E+00
116	240400.00	4080900.00	Residential	13.93	1.70E-02	0.00E+00
117	240425.00	4080900.00	Residential	18.00	2.19E-02	0.00E+00
123	240375.00	4080925.00	Residential	11.32	1.38E-02	0.00E+00
124	240400.00	4080925.00	Residential	14.08	1.71E-02	0.00E+00
125	240425.00	4080925.00	Residential	18.14	2.21E-02	0.00E+00
139	240375.00	4080975.00	Residential	11.17	1.36E-02	0.00E+00
140	240400.00	4080975.00	Residential	13.88	1.69E-02	0.00E+00
141	240425.00	4080975.00	Residential	17.88	2.18E-02	0.00E+00
147	240375.00	4081000.00	Residential	10.87	1.32E-02	0.00E+00
148	240400.00	4081000.00	Residential	13.51	1.64E-02	0.00E+00
149	240425.00	4081000.00	Residential	17.43	2.12E-02	0.00E+00
156	240400.00	4081025.00	Residential	12.91	1.57E-02	0.00E+00
157	240425.00	4081025.00	Residential	16.71	2.03E-02	0.00E+00
163	240375.00	4081050.00	Residential	9.70	1.18E-02	0.00E+00
164	240400.00	4081050.00	Residential	12.04	1.47E-02	0.00E+00
165	240425.00	4081050.00	Residential	15.59	1.90E-02	0.00E+00
171	240375.00	4081075.00	Residential	8.84	1.08E-02	0.00E+00
172	240400.00	4081075.00	Residential	10.84	1.32E-02	0.00E+00
173	240425.00	4081075.00	Residential	13.86	1.69E-02	0.00E+00
189	240375.00	4081125.00	Residential	6.90	8.40E-03	0.00E+00

Table F-1. Construction Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
190	240400.00	4081125.00	Residential	7.93	9.66E-03	0.00E+00
191	240425.00	4081125.00	Residential	9.13	1.11E-02	0.00E+00
192	240450.00	4081125.00	Worker	0.31	1.26E-02	0.00E+00
193	240475.00	4081125.00	Worker	0.34	1.41E-02	0.00E+00
194	240500.00	4081125.00	Worker	0.38	1.55E-02	0.00E+00
195	240525.00	4081125.00	Worker	0.40	1.65E-02	0.00E+00
196	240550.00	4081125.00	Worker	0.40	1.68E-02	0.00E+00
197	240575.00	4081125.00	Worker	0.40	1.65E-02	0.00E+00
207	240375.00	4081150.00	Residential	5.92	7.21E-03	0.00E+00
208	240400.00	4081150.00	Residential	6.57	8.01E-03	0.00E+00
209	240425.00	4081150.00	Residential	7.26	8.84E-03	0.00E+00
210	240450.00	4081150.00	Worker	0.23	9.65E-03	0.00E+00
211	240475.00	4081150.00	Worker	0.25	1.04E-02	0.00E+00
212	240500.00	4081150.00	Worker	0.26	1.09E-02	0.00E+00
213	240525.00	4081150.00	Worker	0.27	1.12E-02	0.00E+00
214	240550.00	4081150.00	Worker	0.27	1.12E-02	0.00E+00
215	240575.00	4081150.00	Worker	0.26	1.09E-02	0.00E+00
216	240600.00	4081150.00	Worker	0.25	1.03E-02	0.00E+00
217	240625.00	4081150.00	Worker	0.23	9.52E-03	0.00E+00
218	240650.00	4081150.00	Worker	0.21	8.49E-03	0.00E+00
219	240675.00	4081150.00	Worker	0.18	7.27E-03	0.00E+00
220	240700.00	4081150.00	Worker	0.14	5.99E-03	0.00E+00
221	240725.00	4081150.00	Worker	0.12	4.91E-03	0.00E+00
222	240750.00	4081150.00	Worker	0.10	4.09E-03	0.00E+00
223	240775.00	4081150.00	Worker	0.08	3.48E-03	0.00E+00
224	240425.00	4081175.00	Residential	5.86	7.13E-03	0.00E+00
225	240450.00	4081175.00	Worker	0.18	7.57E-03	0.00E+00
226	240475.00	4081175.00	Worker	0.19	7.89E-03	0.00E+00
227	240500.00	4081175.00	Worker	0.20	8.10E-03	0.00E+00
228	240525.00	4081175.00	Worker	0.20	8.13E-03	0.00E+00
229	240550.00	4081175.00	Worker	0.19	7.99E-03	0.00E+00
230	240575.00	4081175.00	Worker	0.19	7.69E-03	0.00E+00
231	240600.00	4081175.00	Worker	0.17	7.23E-03	0.00E+00
232	240625.00	4081175.00	Worker	0.16	6.65E-03	0.00E+00
233	240650.00	4081175.00	Worker	0.14	5.96E-03	0.00E+00
234	240675.00	4081175.00	Worker	0.13	5.21E-03	0.00E+00
235	240700.00	4081175.00	Worker	0.11	4.49E-03	0.00E+00
236	240725.00	4081175.00	Worker	0.09	3.85E-03	0.00E+00
237	240750.00	4081175.00	Worker	0.08	3.33E-03	0.00E+00
238	240775.00	4081175.00	Worker	0.07	2.91E-03	0.00E+00
239	240525.00	4081200.00	Worker	0.15	6.19E-03	0.00E+00
240	240550.00	4081200.00	Worker	0.15	6.03E-03	0.00E+00
241	240575.00	4081200.00	Worker	0.14	5.76E-03	0.00E+00
242	240600.00	4081200.00	Worker	0.13	5.41E-03	0.00E+00
243	240625.00	4081200.00	Worker	0.12	4.99E-03	0.00E+00
244	240650.00	4081200.00	Worker	0.11	4.52E-03	0.00E+00
245	240675.00	4081200.00	Worker	0.10	4.03E-03	0.00E+00
246	240700.00	4081200.00	Worker	0.09	3.56E-03	0.00E+00
247	240725.00	4081200.00	Worker	0.08	3.15E-03	0.00E+00
248	240750.00	4081200.00	Worker	0.07	2.79E-03	0.00E+00
249	240400.00	4080500.00	Worker	0.06	2.37E-03	0.00E+00
250	240450.00	4080500.00	Worker	0.06	2.60E-03	0.00E+00

Table F-1. Construction Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
251	240500.00	4080500.00	Worker	0.07	2.87E-03	0.00E+00
256	240750.00	4080500.00	Worker	0.12	5.06E-03	0.00E+00
257	240800.00	4080500.00	Worker	0.13	5.41E-03	0.00E+00
258	240300.00	4080550.00	Worker	0.06	2.44E-03	0.00E+00
259	240350.00	4080550.00	Worker	0.06	2.67E-03	0.00E+00
260	240400.00	4080550.00	Worker	0.07	2.94E-03	0.00E+00
261	240450.00	4080550.00	Worker	0.08	3.27E-03	0.00E+00
267	240750.00	4080550.00	Worker	0.17	6.89E-03	0.00E+00
268	240800.00	4080550.00	Worker	0.17	7.14E-03	0.00E+00
269	240850.00	4080550.00	Worker	0.17	7.03E-03	0.00E+00
270	240300.00	4080600.00	Worker	0.07	3.04E-03	0.00E+00
271	240350.00	4080600.00	Worker	0.08	3.38E-03	0.00E+00
272	240400.00	4080600.00	Worker	0.09	3.79E-03	0.00E+00
274	240500.00	4080600.00	Worker	0.12	5.00E-03	0.00E+00
279	240750.00	4080600.00	Worker	0.23	9.68E-03	0.00E+00
280	240800.00	4080600.00	Worker	0.23	9.51E-03	0.00E+00
281	240850.00	4080600.00	Worker	0.21	8.78E-03	0.00E+00
282	240900.00	4080600.00	Worker	0.19	7.78E-03	0.00E+00
283	240250.00	4080650.00	Worker	0.08	3.38E-03	0.00E+00
284	240300.00	4080650.00	Worker	0.09	3.84E-03	0.00E+00
285	240350.00	4080650.00	Worker	0.11	4.41E-03	0.00E+00
286	240400.00	4080650.00	Worker	0.12	5.13E-03	0.00E+00
287	240800.00	4080650.00	Worker	0.30	1.25E-02	0.00E+00
288	240850.00	4080650.00	Worker	0.25	1.05E-02	0.00E+00
289	240900.00	4080650.00	Worker	0.21	8.74E-03	0.00E+00
297	240300.00	4080750.00	Residential	4.73	5.76E-03	0.00E+00
298	240350.00	4080750.00	Residential	6.05	7.37E-03	0.00E+00
299	240850.00	4080750.00	Worker	0.29	1.22E-02	0.00E+00
300	240900.00	4080750.00	Worker	0.22	9.29E-03	0.00E+00
301	240950.00	4080750.00	Worker	0.17	7.22E-03	0.00E+00
302	240250.00	4080800.00	Residential	4.33	5.28E-03	0.00E+00
303	240300.00	4080800.00	Residential	5.52	6.72E-03	0.00E+00
305	240850.00	4080800.00	Worker	0.29	1.20E-02	0.00E+00
306	240900.00	4080800.00	Worker	0.21	8.89E-03	0.00E+00
307	240950.00	4080800.00	Worker	0.16	6.75E-03	0.00E+00
308	240250.00	4080850.00	Residential	4.76	5.80E-03	0.00E+00
309	240300.00	4080850.00	Residential	6.20	7.55E-03	0.00E+00
311	240850.00	4080850.00	Worker	0.27	1.13E-02	0.00E+00
312	240900.00	4080850.00	Worker	0.20	8.14E-03	0.00E+00
313	240950.00	4080850.00	Worker	0.15	6.05E-03	0.00E+00
314	240250.00	4080900.00	Residential	5.05	6.15E-03	0.00E+00
315	240300.00	4080900.00	Residential	6.65	8.10E-03	0.00E+00
317	240850.00	4080900.00	Worker	0.24	1.01E-02	0.00E+00
318	240900.00	4080900.00	Worker	0.17	7.09E-03	0.00E+00
319	240950.00	4080900.00	Worker	0.12	5.17E-03	0.00E+00
321	240300.00	4080950.00	Residential	6.77	8.24E-03	0.00E+00
323	240850.00	4080950.00	Worker	0.20	8.46E-03	0.00E+00
324	240900.00	4080950.00	Worker	0.14	5.81E-03	0.00E+00
325	240950.00	4080950.00	Worker	0.10	4.22E-03	0.00E+00
326	240250.00	4081000.00	Residential	4.97	6.05E-03	0.00E+00
327	240300.00	4081000.00	Residential	6.51	7.93E-03	0.00E+00
329	240850.00	4081000.00	Worker	0.16	6.50E-03	0.00E+00

Table F-1. Construction Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
330	240900.00	4081000.00	Worker	0.11	4.47E-03	0.00E+00
331	240950.00	4081000.00	Worker	0.08	3.30E-03	0.00E+00
332	240250.00	4081050.00	Residential	4.61	5.61E-03	0.00E+00
333	240300.00	4081050.00	Residential	5.94	7.23E-03	0.00E+00
335	240850.00	4081050.00	Worker	0.11	4.59E-03	0.00E+00
336	240900.00	4081050.00	Worker	0.08	3.30E-03	0.00E+00
337	240950.00	4081050.00	Worker	0.06	2.53E-03	0.00E+00
338	240250.00	4081100.00	Residential	4.14	5.04E-03	0.00E+00
339	240300.00	4081100.00	Residential	5.18	6.31E-03	0.00E+00
340	240350.00	4081100.00	Residential	6.76	8.23E-03	0.00E+00
341	240850.00	4081100.00	Worker	0.08	3.19E-03	0.00E+00
342	240900.00	4081100.00	Worker	0.06	2.45E-03	0.00E+00
343	240950.00	4081100.00	Worker	0.05	1.97E-03	0.00E+00
344	240250.00	4081150.00	Residential	3.62	4.41E-03	0.00E+00
345	240300.00	4081150.00	Residential	4.35	5.30E-03	0.00E+00
346	240350.00	4081150.00	Residential	5.33	6.49E-03	0.00E+00
347	240800.00	4081150.00	Worker	0.07	3.01E-03	0.00E+00
348	240850.00	4081150.00	Worker	0.06	2.34E-03	0.00E+00
349	240900.00	4081150.00	Worker	0.05	1.89E-03	0.00E+00
350	240950.00	4081150.00	Worker	0.04	1.57E-03	0.00E+00
351	240250.00	4081200.00	Residential	3.07	3.73E-03	0.00E+00
352	240300.00	4081200.00	Residential	3.52	4.29E-03	0.00E+00
353	240350.00	4081200.00	Residential	4.04	4.91E-03	0.00E+00
354	240400.00	4081200.00	Residential	4.56	5.55E-03	0.00E+00
355	240450.00	4081200.00	Worker	0.15	6.05E-03	0.00E+00
356	240500.00	4081200.00	Worker	0.15	6.24E-03	0.00E+00
357	240800.00	4081200.00	Worker	0.05	2.22E-03	0.00E+00
358	240850.00	4081200.00	Worker	0.04	1.81E-03	0.00E+00
359	240900.00	4081200.00	Worker	0.04	1.52E-03	0.00E+00
360	240300.00	4081250.00	Residential	2.79	3.40E-03	0.00E+00
361	240350.00	4081250.00	Residential	3.04	3.70E-03	0.00E+00
362	240400.00	4081250.00	Residential	3.25	3.96E-03	0.00E+00
363	240450.00	4081250.00	Worker	0.10	4.09E-03	0.00E+00
364	240500.00	4081250.00	Worker	0.10	4.05E-03	0.00E+00
365	240550.00	4081250.00	Worker	0.09	3.82E-03	0.00E+00
366	240600.00	4081250.00	Worker	0.08	3.45E-03	0.00E+00
367	240650.00	4081250.00	Worker	0.07	2.97E-03	0.00E+00
368	240700.00	4081250.00	Worker	0.06	2.48E-03	0.00E+00
369	240750.00	4081250.00	Worker	0.05	2.07E-03	0.00E+00
370	240800.00	4081250.00	Worker	0.04	1.72E-03	0.00E+00
371	240850.00	4081250.00	Worker	0.04	1.45E-03	0.00E+00
372	240900.00	4081250.00	Worker	0.03	1.24E-03	0.00E+00
373	240350.00	4081300.00	Residential	2.33	2.83E-03	0.00E+00
374	240400.00	4081300.00	Residential	2.40	2.93E-03	0.00E+00
375	240450.00	4081300.00	Worker	0.07	2.94E-03	0.00E+00
376	240500.00	4081300.00	Worker	0.07	2.85E-03	0.00E+00
377	240550.00	4081300.00	Worker	0.06	2.68E-03	0.00E+00
378	240600.00	4081300.00	Worker	0.06	2.44E-03	0.00E+00
379	240650.00	4081300.00	Worker	0.05	2.15E-03	0.00E+00
380	240700.00	4081300.00	Worker	0.05	1.87E-03	0.00E+00
381	240750.00	4081300.00	Worker	0.04	1.61E-03	0.00E+00
382	240800.00	4081300.00	Worker	0.03	1.39E-03	0.00E+00

Table F-1. Construction Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
383	240850.00	4081300.00	Worker	0.03	1.20E-03	0.00E+00
384	240500.00	4081350.00	Worker	0.05	2.14E-03	0.00E+00
385	240550.00	4081350.00	Worker	0.05	2.00E-03	0.00E+00
386	240600.00	4081350.00	Worker	0.04	1.84E-03	0.00E+00
387	240650.00	4081350.00	Worker	0.04	1.65E-03	0.00E+00
388	240700.00	4081350.00	Worker	0.04	1.47E-03	0.00E+00
389	240750.00	4081350.00	Worker	0.03	1.31E-03	0.00E+00
390	240300.00	4080300.00	Worker	0.03	1.11E-03	0.00E+00
391	240400.00	4080300.00	Worker	0.03	1.26E-03	0.00E+00
392	240500.00	4080300.00	Worker	0.03	1.41E-03	0.00E+00
393	240600.00	4080300.00	Worker	0.04	1.57E-03	0.00E+00
395	240800.00	4080300.00	Residential	1.77	2.15E-03	0.00E+00
396	240900.00	4080300.00	Residential	2.03	2.47E-03	0.00E+00
397	240100.00	4080400.00	Worker	0.03	1.17E-03	0.00E+00
398	240200.00	4080400.00	Worker	0.03	1.28E-03	0.00E+00
399	240300.00	4080400.00	Worker	0.03	1.45E-03	0.00E+00
400	240400.00	4080400.00	Worker	0.04	1.68E-03	0.00E+00
401	240500.00	4080400.00	Worker	0.05	1.93E-03	0.00E+00
404	240800.00	4080400.00	Worker	0.08	3.27E-03	0.00E+00
405	240900.00	4080400.00	Worker	0.09	3.64E-03	0.00E+00
406	241000.00	4080400.00	Worker	0.09	3.65E-03	0.00E+00
409	240300.00	4080500.00	Worker	0.05	2.01E-03	0.00E+00
410	240900.00	4080500.00	Worker	0.13	5.47E-03	0.00E+00
411	241000.00	4080500.00	Worker	0.12	4.84E-03	0.00E+00
412	241100.00	4080500.00	Worker	0.10	3.96E-03	0.00E+00
413	240000.00	4080600.00	Worker	0.04	1.73E-03	0.00E+00
415	240200.00	4080600.00	Worker	0.06	2.52E-03	0.00E+00
416	241000.00	4080600.00	Worker	0.14	5.80E-03	0.00E+00
417	241100.00	4080600.00	Worker	0.10	4.23E-03	0.00E+00
418	240000.00	4080700.00	Worker	0.05	2.05E-03	0.00E+00
419	240100.00	4080700.00	Worker	0.06	2.61E-03	0.00E+00
420	240200.00	4080700.00	Worker	0.08	3.45E-03	0.00E+00
424	240000.00	4080800.00	Worker	0.05	2.27E-03	0.00E+00
425	240100.00	4080800.00	Residential	2.49	3.03E-03	0.00E+00
426	240200.00	4080800.00	Residential	3.52	4.29E-03	0.00E+00
427	241000.00	4080800.00	Worker	0.13	5.23E-03	0.00E+00
428	241100.00	4080800.00	Residential	2.72	3.31E-03	0.00E+00
429	241200.00	4080800.00	Residential	1.84	2.24E-03	0.00E+00
430	240000.00	4080900.00	Worker	0.06	2.34E-03	0.00E+00
431	240100.00	4080900.00	Residential	2.66	3.24E-03	0.00E+00
432	240200.00	4080900.00	Residential	3.98	4.84E-03	0.00E+00
433	241000.00	4080900.00	Worker	0.09	3.91E-03	0.00E+00
434	241100.00	4080900.00	Residential	2.01	2.45E-03	0.00E+00
435	241200.00	4080900.00	Residential	1.38	1.68E-03	0.00E+00
438	240200.00	4081000.00	Residential	3.92	4.77E-03	0.00E+00
439	241000.00	4081000.00	Worker	0.06	2.56E-03	0.00E+00
440	241100.00	4081000.00	Residential	1.40	1.70E-03	0.00E+00
441	241200.00	4081000.00	Residential	1.01	1.23E-03	0.00E+00
442	240000.00	4081100.00	Worker	0.05	2.20E-03	0.00E+00
443	240100.00	4081100.00	Residential	2.42	2.94E-03	0.00E+00
444	240200.00	4081100.00	Residential	3.40	4.14E-03	0.00E+00
445	241000.00	4081100.00	Worker	0.04	1.63E-03	0.00E+00

Table F-1. Construction Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
446	241100.00	4081100.00	Residential	0.97	1.19E-03	0.00E+00
447	241200.00	4081100.00	Residential	0.75	9.13E-04	0.00E+00
448	240000.00	4081200.00	Worker	0.05	1.98E-03	0.00E+00
449	240100.00	4081200.00	Residential	2.07	2.52E-03	0.00E+00
450	240200.00	4081200.00	Residential	2.67	3.26E-03	0.00E+00
451	241000.00	4081200.00	Residential	0.92	1.12E-03	0.00E+00
452	241100.00	4081200.00	Residential	0.72	8.76E-04	0.00E+00
453	240000.00	4081300.00	Worker	0.04	1.68E-03	0.00E+00
454	240100.00	4081300.00	Residential	1.64	1.99E-03	0.00E+00
455	240200.00	4081300.00	Residential	1.92	2.34E-03	0.00E+00
456	240300.00	4081300.00	Residential	2.21	2.69E-03	0.00E+00
457	240900.00	4081300.00	Worker	0.03	1.04E-03	0.00E+00
458	241000.00	4081300.00	Residential	0.67	8.16E-04	0.00E+00
459	241100.00	4081300.00	Residential	0.55	6.68E-04	0.00E+00
460	240100.00	4081400.00	Residential	1.23	1.50E-03	0.00E+00
461	240200.00	4081400.00	Residential	1.34	1.63E-03	0.00E+00
462	240300.00	4081400.00	Residential	1.43	1.74E-03	0.00E+00
463	240400.00	4081400.00	Residential	1.46	1.78E-03	0.00E+00
464	240500.00	4081400.00	Worker	0.04	1.67E-03	0.00E+00
465	240600.00	4081400.00	Worker	0.03	1.44E-03	0.00E+00
466	240700.00	4081400.00	Worker	0.03	1.20E-03	0.00E+00
467	240800.00	4081400.00	Worker	0.02	9.77E-04	0.00E+00
468	240900.00	4081400.00	Worker	0.02	7.77E-04	0.00E+00
469	241000.00	4081400.00	Residential	0.51	6.25E-04	0.00E+00
470	241100.00	4081400.00	Residential	0.43	5.22E-04	0.00E+00
471	240200.00	4081500.00	Residential	0.97	1.18E-03	0.00E+00
472	240300.00	4081500.00	Residential	1.00	1.22E-03	0.00E+00
473	240400.00	4081500.00	Residential	0.99	1.20E-03	0.00E+00
474	240500.00	4081500.00	Worker	0.03	1.11E-03	0.00E+00
475	240600.00	4081500.00	Worker	0.02	9.74E-04	0.00E+00
476	240700.00	4081500.00	Worker	0.02	8.46E-04	0.00E+00
477	240800.00	4081500.00	Worker	0.02	7.31E-04	0.00E+00
478	240900.00	4081500.00	Worker	0.01	6.13E-04	0.00E+00
479	241000.00	4081500.00	Residential	0.42	5.06E-04	0.00E+00
480	240500.00	4081600.00	Worker	0.02	8.00E-04	0.00E+00
481	240600.00	4081600.00	Worker	0.02	7.10E-04	0.00E+00
482	240700.00	4081600.00	Worker	0.02	6.35E-04	0.00E+00
483	240800.00	4081600.00	Worker	0.01	5.70E-04	0.00E+00
484	240500.00	4079750.00	Worker	0.01	4.62E-04	0.00E+00
485	240750.00	4079750.00	Worker	0.01	5.37E-04	0.00E+00
486	240000.00	4080000.00	Residential	0.39	4.80E-04	0.00E+00
487	240250.00	4080000.00	Worker	0.01	5.99E-04	0.00E+00
489	240750.00	4080000.00	Worker	0.02	8.57E-04	0.00E+00
490	241000.00	4080000.00	Residential	0.92	1.12E-03	0.00E+00
491	241250.00	4080000.00	Residential	1.08	1.31E-03	0.00E+00
492	239750.00	4080250.00	Worker	0.02	6.57E-04	0.00E+00
493	240000.00	4080250.00	Worker	0.02	7.65E-04	0.00E+00
494	240250.00	4080250.00	Worker	0.02	9.30E-04	0.00E+00
495	241000.00	4080250.00	Residential	1.86	2.26E-03	0.00E+00
496	241250.00	4080250.00	Residential	1.77	2.16E-03	0.00E+00
501	241250.00	4080500.00	Worker	0.07	2.77E-03	0.00E+00
506	241500.00	4080750.00	Residential	0.86	1.04E-03	0.00E+00

Table F-1. Construction Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
507	239500.00	4081000.00	Worker	0.02	8.00E-04	0.00E+00
508	239750.00	4081000.00	Worker	0.03	1.25E-03	0.00E+00
510	241500.00	4081000.00	Residential	0.50	6.04E-04	0.00E+00
511	239500.00	4081250.00	Worker	0.02	7.70E-04	0.00E+00
512	239750.00	4081250.00	Worker	0.03	1.15E-03	0.00E+00
513	241250.00	4081250.00	Residential	0.48	5.79E-04	0.00E+00
514	241500.00	4081250.00	Residential	0.32	3.95E-04	0.00E+00
515	239750.00	4081500.00	Worker	0.02	8.63E-04	0.00E+00
516	240000.00	4081500.00	Worker	0.03	1.06E-03	0.00E+00
517	241250.00	4081500.00	Residential	0.28	3.45E-04	0.00E+00
518	241500.00	4081500.00	Residential	0.22	2.68E-04	0.00E+00
519	239750.00	4081750.00	Worker	0.01	4.96E-04	0.00E+00
520	240000.00	4081750.00	Worker	0.01	5.31E-04	0.00E+00
521	240250.00	4081750.00	Worker	0.01	5.60E-04	0.00E+00
522	240500.00	4081750.00	Worker	0.01	4.81E-04	0.00E+00
523	240750.00	4081750.00	Worker	0.01	4.27E-04	0.00E+00
524	241000.00	4081750.00	Worker	0.01	3.36E-04	0.00E+00
525	241250.00	4081750.00	Worker	0.01	2.42E-04	0.00E+00
526	240250.00	4082000.00	Worker	0.01	3.67E-04	0.00E+00
527	240500.00	4082000.00	Worker	0.01	3.08E-04	0.00E+00
528	240750.00	4082000.00	Worker	0.01	2.51E-04	0.00E+00
529	241000.00	4082000.00	Worker	0.01	2.30E-04	0.00E+00
531	240000.00	4079000.00	Residential	0.16	1.91E-04	0.00E+00
532	240500.00	4079000.00	Residential	0.16	2.00E-04	0.00E+00
534	241500.00	4079000.00	Worker	0.01	3.10E-04	0.00E+00
535	239000.00	4079500.00	Worker	0.00	1.95E-04	0.00E+00
536	239500.00	4079500.00	Residential	0.18	2.20E-04	0.00E+00
537	240000.00	4079500.00	Residential	0.23	2.74E-04	0.00E+00
538	240500.00	4079500.00	Residential	0.27	3.32E-04	0.00E+00
539	241000.00	4079500.00	Worker	0.01	4.44E-04	0.00E+00
540	241500.00	4079500.00	Worker	0.01	5.98E-04	0.00E+00
541	242000.00	4079500.00	Residential	0.49	5.97E-04	0.00E+00
542	239000.00	4080000.00	Worker	0.01	3.16E-04	0.00E+00
543	239500.00	4080000.00	Residential	0.32	3.90E-04	0.00E+00
544	241500.00	4080000.00	Residential	1.03	1.25E-03	0.00E+00
545	242000.00	4080000.00	Residential	0.65	7.91E-04	0.00E+00
546	242500.00	4080000.00	Residential	0.36	4.34E-04	0.00E+00
547	238500.00	4080500.00	Worker	0.01	2.79E-04	0.00E+00
548	239000.00	4080500.00	Worker	0.01	4.30E-04	0.00E+00
549	242000.00	4080500.00	Residential	0.47	5.77E-04	0.00E+00
550	242500.00	4080500.00	Residential	0.25	3.02E-04	0.00E+00
551	238500.00	4081000.00	Worker	0.01	2.73E-04	0.00E+00
552	239000.00	4081000.00	Worker	0.01	4.28E-04	0.00E+00
553	242000.00	4081000.00	Residential	0.23	2.85E-04	0.00E+00
554	242500.00	4081000.00	Residential	0.14	1.73E-04	0.00E+00
555	238500.00	4081500.00	Worker	0.01	2.49E-04	0.00E+00
556	239000.00	4081500.00	Worker	0.01	3.92E-04	0.00E+00
557	239500.00	4081500.00	Worker	0.02	6.63E-04	0.00E+00
558	242000.00	4081500.00	Residential	0.15	1.79E-04	0.00E+00
559	242500.00	4081500.00	Residential	0.10	1.24E-04	0.00E+00
560	239000.00	4082000.00	Worker	0.01	2.86E-04	0.00E+00
561	239500.00	4082000.00	Worker	0.01	3.34E-04	0.00E+00

Table F-1. Construction Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
562	240000.00	4082000.00	Worker	0.01	3.66E-04	0.00E+00
563	241500.00	4082000.00	Residential	0.12	1.47E-04	0.00E+00
564	242000.00	4082000.00	Residential	0.09	1.06E-04	0.00E+00
565	239500.00	4082500.00	Worker	0.00	2.02E-04	0.00E+00
566	240000.00	4082500.00	Worker	0.01	2.10E-04	0.00E+00
567	240500.00	4082500.00	Worker	0.00	1.67E-04	0.00E+00
568	241000.00	4082500.00	Worker	0.00	1.39E-04	0.00E+00
569	241500.00	4082500.00	Worker	0.00	1.02E-04	0.00E+00
570	242000.00	4082500.00	Worker	0.00	7.38E-05	0.00E+00
571	240000.00	4083000.00	Worker	0.00	1.32E-04	0.00E+00
572	240500.00	4083000.00	Worker	0.00	1.07E-04	0.00E+00
573	241000.00	4083000.00	Worker	0.00	9.31E-05	0.00E+00
574	240982.00	4080428.00	Sensitive	3.30	4.02E-03	0.00E+00
575	241114.00	4080505.00	Sensitive	3.17	3.86E-03	0.00E+00
576	241812.00	4080393.00	Sensitive	0.72	8.83E-04	0.00E+00
577	239709.00	4079647.00	Sensitive	0.22	2.67E-04	0.00E+00
578	239709.00	4079647.00	Sensitive	0.22	2.67E-04	0.00E+00
579	242094.00	4081102.00	Sensitive	0.19	2.25E-04	0.00E+00
580	242489.00	4081376.00	Sensitive	0.11	1.32E-04	0.00E+00
581	241998.00	4079399.00	Sensitive	0.45	5.44E-04	0.00E+00
582	242523.00	4080146.00	Sensitive	0.32	3.86E-04	0.00E+00
583	240160.00	4078896.00	Sensitive	0.15	1.80E-04	0.00E+00
584	242576.00	4081764.00	Sensitive	0.08	1.02E-04	0.00E+00
585	242632.00	4080241.00	Sensitive	0.26	3.21E-04	0.00E+00

Abbreviations:
m - meter

Table F-2. Operational Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
1	240425.00	4080650.00	Worker	0.53	1.39E-03	3.98E-02
3	240475.00	4080650.00	Worker	0.56	1.50E-03	4.23E-02
4	240500.00	4080650.00	Worker	0.56	1.55E-03	4.38E-02
13	240725.00	4080650.00	Worker	0.78	2.05E-03	4.11E-02
14	240750.00	4080650.00	Worker	0.69	2.17E-03	4.02E-02
15	240400.00	4080675.00	Worker	0.66	1.46E-03	4.16E-02
16	240425.00	4080675.00	Worker	0.68	1.51E-03	4.23E-02
18	240475.00	4080675.00	Worker	0.72	1.64E-03	4.53E-02
19	240500.00	4080675.00	Worker	0.73	1.70E-03	4.73E-02
28	240725.00	4080675.00	Worker	0.88	2.30E-03	4.46E-02
29	240750.00	4080675.00	Worker	0.75	2.44E-03	4.34E-02
30	240775.00	4080675.00	Worker	0.62	2.58E-03	4.24E-02
32	240400.00	4080700.00	Worker	0.90	1.59E-03	4.51E-02
33	240425.00	4080700.00	Worker	0.92	1.65E-03	4.51E-02
35	240475.00	4080700.00	Worker	0.98	1.79E-03	4.84E-02
36	240500.00	4080700.00	Worker	1.01	1.87E-03	5.05E-02
67	240375.00	4080750.00	Residential	5.56	1.88E-03	5.00E-02
75	240375.00	4080775.00	Residential	5.22	2.10E-03	5.24E-02
76	240400.00	4080775.00	Residential	6.11	2.17E-03	5.57E-02
77	240425.00	4080775.00	Residential	7.61	2.25E-03	5.75E-02
83	240375.00	4080800.00	Residential	5.17	2.35E-03	5.58E-02
84	240400.00	4080800.00	Residential	6.16	2.44E-03	5.98E-02
85	240425.00	4080800.00	Residential	7.76	2.54E-03	6.27E-02
91	240375.00	4080825.00	Residential	5.20	2.65E-03	5.94E-02
92	240400.00	4080825.00	Residential	6.26	2.76E-03	6.34E-02
93	240425.00	4080825.00	Residential	7.95	2.88E-03	6.87E-02
99	240375.00	4080850.00	Residential	5.13	3.01E-03	6.27E-02
100	240400.00	4080850.00	Residential	6.22	3.15E-03	6.79E-02
101	240425.00	4080850.00	Residential	8.30	3.30E-03	7.28E-02
108	240400.00	4080875.00	Residential	5.76	3.63E-03	7.21E-02
109	240425.00	4080875.00	Residential	7.07	3.82E-03	7.87E-02
115	240375.00	4080900.00	Residential	4.61	3.99E-03	7.18E-02
116	240400.00	4080900.00	Residential	5.15	4.23E-03	7.75E-02
117	240425.00	4080900.00	Residential	5.76	4.48E-03	8.47E-02
123	240375.00	4080925.00	Residential	4.34	4.63E-03	8.11E-02
124	240400.00	4080925.00	Residential	4.70	4.97E-03	8.34E-02
125	240425.00	4080925.00	Residential	5.15	5.32E-03	9.16E-02
139	240375.00	4080975.00	Residential	4.07	6.02E-03	9.45E-02
140	240400.00	4080975.00	Residential	4.46	6.74E-03	1.04E-01
141	240425.00	4080975.00	Residential	4.99	7.55E-03	1.18E-01
147	240375.00	4081000.00	Residential	4.02	6.59E-03	9.92E-02
148	240400.00	4081000.00	Residential	4.48	7.55E-03	1.08E-01
149	240425.00	4081000.00	Residential	5.14	8.71E-03	1.24E-01
156	240400.00	4081025.00	Residential	4.50	8.12E-03	1.14E-01
157	240425.00	4081025.00	Residential	5.28	9.60E-03	1.33E-01
163	240375.00	4081050.00	Residential	3.89	7.14E-03	1.02E-01
164	240400.00	4081050.00	Residential	4.47	8.42E-03	1.17E-01
165	240425.00	4081050.00	Residential	5.32	1.01E-02	1.34E-01
171	240375.00	4081075.00	Residential	3.84	7.19E-03	1.06E-01
172	240400.00	4081075.00	Residential	4.42	8.51E-03	1.21E-01
173	240425.00	4081075.00	Residential	5.31	1.03E-02	1.40E-01
189	240375.00	4081125.00	Residential	3.43	7.12E-03	1.06E-01

Table F-2. Operational Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
190	240400.00	4081125.00	Residential	3.96	8.44E-03	1.21E-01
191	240425.00	4081125.00	Residential	4.67	1.02E-02	1.38E-01
192	240450.00	4081125.00	Worker	0.79	1.26E-02	1.61E-01
193	240475.00	4081125.00	Worker	0.95	1.60E-02	1.90E-01
194	240500.00	4081125.00	Worker	1.21	2.11E-02	2.28E-01
195	240525.00	4081125.00	Worker	1.62	2.91E-02	2.83E-01
196	240550.00	4081125.00	Worker	2.30	4.25E-02	3.66E-01
197	240575.00	4081125.00	Worker	3.47	6.52E-02	4.69E-01
207	240375.00	4081150.00	Residential	3.26	7.02E-03	1.04E-01
208	240400.00	4081150.00	Residential	3.74	8.29E-03	1.17E-01
209	240425.00	4081150.00	Residential	4.39	9.95E-03	1.34E-01
210	240450.00	4081150.00	Worker	0.74	1.22E-02	1.55E-01
211	240475.00	4081150.00	Worker	0.88	1.52E-02	1.82E-01
212	240500.00	4081150.00	Worker	1.09	1.94E-02	2.23E-01
213	240525.00	4081150.00	Worker	1.39	2.52E-02	2.70E-01
214	240550.00	4081150.00	Worker	1.76	3.26E-02	3.34E-01
215	240575.00	4081150.00	Worker	2.17	4.07E-02	4.03E-01
216	240600.00	4081150.00	Worker	2.45	4.62E-02	4.85E-01
217	240625.00	4081150.00	Worker	2.35	4.43E-02	5.17E-01
218	240650.00	4081150.00	Worker	1.81	3.37E-02	4.15E-01
219	240675.00	4081150.00	Worker	1.26	2.32E-02	3.25E-01
220	240700.00	4081150.00	Worker	0.89	1.61E-02	2.17E-01
221	240725.00	4081150.00	Worker	0.66	1.17E-02	2.21E-01
222	240750.00	4081150.00	Worker	0.51	8.93E-03	1.76E-01
223	240775.00	4081150.00	Worker	0.41	7.04E-03	1.48E-01
224	240425.00	4081175.00	Residential	4.08	9.41E-03	1.32E-01
225	240450.00	4081175.00	Worker	0.67	1.12E-02	1.51E-01
226	240475.00	4081175.00	Worker	0.78	1.35E-02	1.76E-01
227	240500.00	4081175.00	Worker	0.91	1.62E-02	2.09E-01
228	240525.00	4081175.00	Worker	1.06	1.92E-02	2.44E-01
229	240550.00	4081175.00	Worker	1.20	2.20E-02	2.88E-01
230	240575.00	4081175.00	Worker	1.31	2.41E-02	3.36E-01
231	240600.00	4081175.00	Worker	1.34	2.49E-02	3.63E-01
232	240625.00	4081175.00	Worker	1.24	2.30E-02	3.91E-01
233	240650.00	4081175.00	Worker	1.02	1.87E-02	2.78E-01
234	240675.00	4081175.00	Worker	0.80	1.45E-02	2.46E-01
235	240700.00	4081175.00	Worker	0.61	1.09E-02	1.77E-01
236	240725.00	4081175.00	Worker	0.48	8.39E-03	1.26E-01
237	240750.00	4081175.00	Worker	0.39	6.66E-03	1.40E-01
238	240775.00	4081175.00	Worker	0.32	5.45E-03	1.31E-01
239	240525.00	4081200.00	Worker	0.78	1.38E-02	2.16E-01
240	240550.00	4081200.00	Worker	0.82	1.48E-02	2.51E-01
241	240575.00	4081200.00	Worker	0.85	1.54E-02	2.79E-01
242	240600.00	4081200.00	Worker	0.84	1.53E-02	2.78E-01
243	240625.00	4081200.00	Worker	0.77	1.40E-02	3.04E-01
244	240650.00	4081200.00	Worker	0.66	1.19E-02	2.01E-01
245	240675.00	4081200.00	Worker	0.55	9.80E-03	1.81E-01
246	240700.00	4081200.00	Worker	0.45	7.93E-03	1.63E-01
247	240725.00	4081200.00	Worker	0.37	6.35E-03	1.08E-01
248	240750.00	4081200.00	Worker	0.31	5.17E-03	8.77E-02
249	240400.00	4080500.00	Worker	0.22	8.86E-04	2.84E-02
250	240450.00	4080500.00	Worker	0.22	9.37E-04	3.13E-02

Table F-2. Operational Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
251	240500.00	4080500.00	Worker	0.23	9.71E-04	2.97E-02
256	240750.00	4080500.00	Worker	0.33	1.22E-03	2.76E-02
257	240800.00	4080500.00	Worker	0.34	1.32E-03	2.67E-02
258	240300.00	4080550.00	Worker	0.28	8.99E-04	2.88E-02
259	240350.00	4080550.00	Worker	0.27	9.44E-04	2.89E-02
260	240400.00	4080550.00	Worker	0.27	1.00E-03	3.07E-02
261	240450.00	4080550.00	Worker	0.28	1.07E-03	3.39E-02
267	240750.00	4080550.00	Worker	0.42	1.44E-03	3.11E-02
268	240800.00	4080550.00	Worker	0.41	1.57E-03	3.02E-02
269	240850.00	4080550.00	Worker	0.37	1.71E-03	2.91E-02
270	240300.00	4080600.00	Worker	0.36	1.03E-03	3.13E-02
271	240350.00	4080600.00	Worker	0.36	1.08E-03	3.32E-02
272	240400.00	4080600.00	Worker	0.36	1.15E-03	3.43E-02
274	240500.00	4080600.00	Worker	0.37	1.31E-03	3.72E-02
279	240750.00	4080600.00	Worker	0.56	1.75E-03	3.50E-02
280	240800.00	4080600.00	Worker	0.48	1.92E-03	3.37E-02
281	240850.00	4080600.00	Worker	0.40	2.11E-03	3.23E-02
282	240900.00	4080600.00	Worker	0.33	2.31E-03	3.05E-02
283	240250.00	4080650.00	Worker	0.59	1.16E-03	3.21E-02
284	240300.00	4080650.00	Worker	0.52	1.21E-03	3.52E-02
285	240350.00	4080650.00	Worker	0.51	1.26E-03	3.72E-02
286	240400.00	4080650.00	Worker	0.52	1.34E-03	3.82E-02
287	240800.00	4080650.00	Worker	0.52	2.41E-03	3.84E-02
288	240850.00	4080650.00	Worker	0.40	2.68E-03	3.57E-02
289	240900.00	4080650.00	Worker	0.34	2.92E-03	3.48E-02
297	240300.00	4080750.00	Residential	4.03	1.72E-03	4.23E-02
298	240350.00	4080750.00	Residential	4.96	1.83E-03	4.63E-02
299	240850.00	4080750.00	Worker	0.42	4.72E-03	4.99E-02
300	240900.00	4080750.00	Worker	0.38	4.89E-03	4.60E-02
301	240950.00	4080750.00	Worker	0.35	4.75E-03	4.17E-02
302	240250.00	4080800.00	Residential	3.00	1.96E-03	4.16E-02
303	240300.00	4080800.00	Residential	3.58	2.11E-03	4.69E-02
305	240850.00	4080800.00	Worker	0.47	6.51E-03	5.85E-02
306	240900.00	4080800.00	Worker	0.43	6.36E-03	5.20E-02
307	240950.00	4080800.00	Worker	0.38	5.78E-03	4.68E-02
308	240250.00	4080850.00	Residential	2.91	2.42E-03	4.89E-02
309	240300.00	4080850.00	Residential	3.48	2.64E-03	5.13E-02
311	240850.00	4080850.00	Worker	0.57	9.00E-03	6.83E-02
312	240900.00	4080850.00	Worker	0.49	8.02E-03	5.98E-02
313	240950.00	4080850.00	Worker	0.41	6.70E-03	5.05E-02
314	240250.00	4080900.00	Residential	2.91	2.94E-03	5.43E-02
315	240300.00	4080900.00	Residential	3.44	3.34E-03	6.33E-02
317	240850.00	4080900.00	Worker	0.70	1.20E-02	8.05E-02
318	240900.00	4080900.00	Worker	0.55	9.38E-03	6.74E-02
319	240950.00	4080900.00	Worker	0.42	7.08E-03	5.85E-02
321	240300.00	4080950.00	Residential	3.30	4.06E-03	6.79E-02
323	240850.00	4080950.00	Worker	0.80	1.40E-02	9.42E-02
324	240900.00	4080950.00	Worker	0.55	9.55E-03	7.35E-02
325	240950.00	4080950.00	Worker	0.39	6.61E-03	5.50E-02
326	240250.00	4081000.00	Residential	2.65	3.65E-03	6.02E-02
327	240300.00	4081000.00	Residential	3.07	4.53E-03	7.22E-02
329	240850.00	4081000.00	Worker	0.74	1.31E-02	9.49E-02

Table F-2. Operational Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
330	240900.00	4081000.00	Worker	0.47	8.15E-03	7.19E-02
331	240950.00	4081000.00	Worker	0.33	5.47E-03	5.93E-02
332	240250.00	4081050.00	Residential	2.48	3.72E-03	6.32E-02
333	240300.00	4081050.00	Residential	2.87	4.70E-03	7.46E-02
335	240850.00	4081050.00	Worker	0.54	9.51E-03	1.03E-01
336	240900.00	4081050.00	Worker	0.35	5.99E-03	7.83E-02
337	240950.00	4081050.00	Worker	0.25	4.12E-03	6.24E-02
338	240250.00	4081100.00	Residential	2.18	3.69E-03	6.49E-02
339	240300.00	4081100.00	Residential	2.58	4.67E-03	7.78E-02
340	240350.00	4081100.00	Residential	3.19	6.14E-03	9.61E-02
341	240850.00	4081100.00	Worker	0.36	5.95E-03	1.01E-01
342	240900.00	4081100.00	Worker	0.25	4.05E-03	7.62E-02
343	240950.00	4081100.00	Worker	0.19	2.94E-03	6.04E-02
344	240250.00	4081150.00	Residential	1.97	3.64E-03	6.35E-02
345	240300.00	4081150.00	Residential	2.34	4.60E-03	7.58E-02
346	240350.00	4081150.00	Residential	2.88	6.03E-03	9.26E-02
347	240800.00	4081150.00	Worker	0.34	5.69E-03	1.22E-01
348	240850.00	4081150.00	Worker	0.24	3.92E-03	8.64E-02
349	240900.00	4081150.00	Worker	0.18	2.87E-03	6.86E-02
350	240950.00	4081150.00	Worker	0.14	2.19E-03	5.48E-02
351	240250.00	4081200.00	Residential	1.81	3.54E-03	6.14E-02
352	240300.00	4081200.00	Residential	2.13	4.41E-03	7.21E-02
353	240350.00	4081200.00	Residential	2.58	5.65E-03	8.87E-02
354	240400.00	4081200.00	Residential	3.23	7.40E-03	1.11E-01
355	240450.00	4081200.00	Worker	0.59	9.82E-03	1.48E-01
356	240500.00	4081200.00	Worker	0.72	1.26E-02	1.91E-01
357	240800.00	4081200.00	Worker	0.23	3.68E-03	9.71E-02
358	240850.00	4081200.00	Worker	0.18	2.78E-03	7.75E-02
359	240900.00	4081200.00	Worker	0.14	2.17E-03	6.32E-02
360	240300.00	4081250.00	Residential	1.87	3.99E-03	6.83E-02
361	240350.00	4081250.00	Residential	2.17	4.83E-03	8.72E-02
362	240400.00	4081250.00	Residential	2.52	5.77E-03	1.05E-01
363	240450.00	4081250.00	Worker	0.41	6.63E-03	1.28E-01
364	240500.00	4081250.00	Worker	0.43	7.26E-03	1.58E-01
365	240550.00	4081250.00	Worker	0.44	7.67E-03	1.79E-01
366	240600.00	4081250.00	Worker	0.43	7.45E-03	1.95E-01
367	240650.00	4081250.00	Worker	0.35	6.01E-03	1.24E-01
368	240700.00	4081250.00	Worker	0.28	4.67E-03	1.08E-01
369	240750.00	4081250.00	Worker	0.21	3.44E-03	7.81E-02
370	240800.00	4081250.00	Worker	0.16	2.55E-03	5.11E-02
371	240850.00	4081250.00	Worker	0.13	2.01E-03	5.60E-02
372	240900.00	4081250.00	Worker	0.11	1.65E-03	5.60E-02
373	240350.00	4081300.00	Residential	1.71	3.77E-03	7.74E-02
374	240400.00	4081300.00	Residential	1.85	4.10E-03	9.29E-02
375	240450.00	4081300.00	Worker	0.28	4.35E-03	1.10E-01
376	240500.00	4081300.00	Worker	0.28	4.56E-03	1.24E-01
377	240550.00	4081300.00	Worker	0.28	4.66E-03	1.28E-01
378	240600.00	4081300.00	Worker	0.26	4.39E-03	1.36E-01
379	240650.00	4081300.00	Worker	0.22	3.65E-03	8.75E-02
380	240700.00	4081300.00	Worker	0.19	3.05E-03	7.80E-02
381	240750.00	4081300.00	Worker	0.16	2.47E-03	7.04E-02
382	240800.00	4081300.00	Worker	0.13	1.92E-03	4.43E-02

Table F-2. Operational Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
383	240850.00	4081300.00	Worker	0.10	1.53E-03	3.49E-02
384	240500.00	4081350.00	Worker	0.20	3.12E-03	9.65E-02
385	240550.00	4081350.00	Worker	0.20	3.13E-03	9.68E-02
386	240600.00	4081350.00	Worker	0.18	2.89E-03	1.08E-01
387	240650.00	4081350.00	Worker	0.16	2.46E-03	6.66E-02
388	240700.00	4081350.00	Worker	0.14	2.14E-03	6.04E-02
389	240750.00	4081350.00	Worker	0.12	1.84E-03	5.55E-02
390	240300.00	4080300.00	Worker	0.11	5.33E-04	1.99E-02
391	240400.00	4080300.00	Worker	0.11	5.79E-04	2.46E-02
392	240500.00	4080300.00	Worker	0.12	5.97E-04	2.03E-02
393	240600.00	4080300.00	Worker	0.12	6.08E-04	2.09E-02
395	240800.00	4080300.00	Residential	1.14	7.45E-04	1.84E-02
396	240900.00	4080300.00	Residential	1.24	8.29E-04	1.74E-02
397	240100.00	4080400.00	Worker	0.13	5.58E-04	1.90E-02
398	240200.00	4080400.00	Worker	0.14	5.89E-04	2.06E-02
399	240300.00	4080400.00	Worker	0.15	6.39E-04	2.15E-02
400	240400.00	4080400.00	Worker	0.15	7.10E-04	2.87E-02
401	240500.00	4080400.00	Worker	0.15	7.49E-04	2.44E-02
404	240800.00	4080400.00	Worker	0.23	9.67E-04	2.16E-02
405	240900.00	4080400.00	Worker	0.23	1.09E-03	2.07E-02
406	241000.00	4080400.00	Worker	0.21	1.24E-03	1.91E-02
409	240300.00	4080500.00	Worker	0.22	7.92E-04	2.57E-02
410	240900.00	4080500.00	Worker	0.30	1.53E-03	2.46E-02
411	241000.00	4080500.00	Worker	0.23	1.75E-03	2.33E-02
412	241100.00	4080500.00	Worker	0.19	1.83E-03	2.14E-02
413	240000.00	4080600.00	Worker	0.24	8.16E-04	2.08E-02
415	240200.00	4080600.00	Worker	0.42	9.58E-04	2.76E-02
416	241000.00	4080600.00	Worker	0.25	2.54E-03	2.81E-02
417	241100.00	4080600.00	Worker	0.20	2.45E-03	2.51E-02
418	240000.00	4080700.00	Worker	0.24	1.06E-03	2.53E-02
419	240100.00	4080700.00	Worker	0.33	1.17E-03	2.69E-02
420	240200.00	4080700.00	Worker	0.52	1.29E-03	3.21E-02
424	240000.00	4080800.00	Worker	0.23	1.34E-03	2.85E-02
425	240100.00	4080800.00	Residential	2.02	1.58E-03	3.43E-02
426	240200.00	4080800.00	Residential	2.59	1.83E-03	3.78E-02
427	241000.00	4080800.00	Worker	0.33	5.03E-03	4.11E-02
428	241100.00	4080800.00	Residential	1.62	3.53E-03	3.35E-02
429	241200.00	4080800.00	Residential	1.13	2.41E-03	2.49E-02
430	240000.00	4080900.00	Worker	0.22	1.54E-03	3.08E-02
431	240100.00	4080900.00	Residential	1.92	1.97E-03	3.76E-02
432	240200.00	4080900.00	Residential	2.50	2.57E-03	4.79E-02
433	241000.00	4080900.00	Worker	0.32	5.32E-03	4.67E-02
434	241100.00	4080900.00	Residential	1.39	3.12E-03	3.29E-02
435	241200.00	4080900.00	Residential	0.92	1.99E-03	2.50E-02
438	240200.00	4081000.00	Residential	2.32	3.00E-03	5.19E-02
439	241000.00	4081000.00	Worker	0.24	3.90E-03	4.95E-02
440	241100.00	4081000.00	Residential	1.03	2.26E-03	3.57E-02
441	241200.00	4081000.00	Residential	0.70	1.48E-03	2.73E-02
442	240000.00	4081100.00	Worker	0.18	1.59E-03	3.37E-02
443	240100.00	4081100.00	Residential	1.53	2.12E-03	4.22E-02
444	240200.00	4081100.00	Residential	1.90	3.00E-03	5.54E-02
445	241000.00	4081100.00	Worker	0.15	2.24E-03	4.95E-02

Table F-2. Operational Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
446	241100.00	4081100.00	Residential	0.73	1.43E-03	3.55E-02
447	241200.00	4081100.00	Residential	0.50	1.00E-03	2.72E-02
448	240000.00	4081200.00	Worker	0.15	1.56E-03	3.25E-02
449	240100.00	4081200.00	Residential	1.26	2.07E-03	4.05E-02
450	240200.00	4081200.00	Residential	1.57	2.90E-03	5.23E-02
451	241000.00	4081200.00	Residential	0.67	1.41E-03	4.18E-02
452	241100.00	4081200.00	Residential	0.49	9.89E-04	3.12E-02
453	240000.00	4081300.00	Worker	0.13	1.49E-03	3.08E-02
454	240100.00	4081300.00	Residential	1.07	1.92E-03	3.87E-02
455	240200.00	4081300.00	Residential	1.28	2.54E-03	4.81E-02
456	240300.00	4081300.00	Residential	1.57	3.35E-03	6.78E-02
457	240900.00	4081300.00	Worker	0.09	1.27E-03	3.47E-02
458	241000.00	4081300.00	Residential	0.47	9.53E-04	3.73E-02
459	241100.00	4081300.00	Residential	0.37	7.41E-04	2.87E-02
460	240100.00	4081400.00	Residential	0.85	1.59E-03	3.80E-02
461	240200.00	4081400.00	Residential	0.94	1.86E-03	4.57E-02
462	240300.00	4081400.00	Residential	0.99	2.05E-03	5.67E-02
463	240400.00	4081400.00	Residential	1.06	2.17E-03	7.11E-02
464	240500.00	4081400.00	Worker	0.15	2.27E-03	7.71E-02
465	240600.00	4081400.00	Worker	0.13	2.05E-03	8.69E-02
466	240700.00	4081400.00	Worker	0.10	1.58E-03	4.79E-02
467	240800.00	4081400.00	Worker	0.08	1.22E-03	4.16E-02
468	240900.00	4081400.00	Worker	0.06	8.66E-04	2.23E-02
469	241000.00	4081400.00	Residential	0.35	6.54E-04	1.76E-02
470	241100.00	4081400.00	Residential	0.28	5.35E-04	2.26E-02
471	240200.00	4081500.00	Residential	0.65	1.24E-03	3.96E-02
472	240300.00	4081500.00	Residential	0.65	1.29E-03	4.71E-02
473	240400.00	4081500.00	Residential	0.68	1.34E-03	5.42E-02
474	240500.00	4081500.00	Worker	0.09	1.36E-03	5.27E-02
475	240600.00	4081500.00	Worker	0.08	1.20E-03	5.89E-02
476	240700.00	4081500.00	Worker	0.07	9.74E-04	3.19E-02
477	240800.00	4081500.00	Worker	0.06	8.31E-04	2.94E-02
478	240900.00	4081500.00	Worker	0.05	6.51E-04	2.34E-02
479	241000.00	4081500.00	Residential	0.28	5.01E-04	1.44E-02
480	240500.00	4081600.00	Worker	0.07	9.05E-04	4.22E-02
481	240600.00	4081600.00	Worker	0.06	7.90E-04	4.21E-02
482	240700.00	4081600.00	Worker	0.05	6.67E-04	2.42E-02
483	240800.00	4081600.00	Worker	0.04	5.96E-04	2.25E-02
484	240500.00	4079750.00	Worker	0.04	2.45E-04	9.93E-03
485	240750.00	4079750.00	Worker	0.05	2.67E-04	9.02E-03
486	240000.00	4080000.00	Residential	0.36	2.77E-04	1.11E-02
487	240250.00	4080000.00	Worker	0.05	3.28E-04	2.00E-02
489	240750.00	4080000.00	Worker	0.07	3.87E-04	1.21E-02
490	241000.00	4080000.00	Residential	0.63	4.75E-04	1.11E-02
491	241250.00	4080000.00	Residential	0.62	5.76E-04	9.98E-03
492	239750.00	4080250.00	Worker	0.08	3.64E-04	1.17E-02
493	240000.00	4080250.00	Worker	0.08	4.03E-04	1.46E-02
494	240250.00	4080250.00	Worker	0.09	4.66E-04	1.65E-02
495	241000.00	4080250.00	Residential	1.08	8.08E-04	1.53E-02
496	241250.00	4080250.00	Residential	0.85	9.86E-04	1.35E-02
501	241250.00	4080500.00	Worker	0.14	1.69E-03	1.81E-02
506	241500.00	4080750.00	Residential	0.51	9.92E-04	1.38E-02

Table F-2. Operational Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
507	239500.00	4081000.00	Worker	0.09	6.16E-04	1.50E-02
508	239750.00	4081000.00	Worker	0.13	9.33E-04	2.08E-02
510	241500.00	4081000.00	Residential	0.31	6.05E-04	1.54E-02
511	239500.00	4081250.00	Worker	0.08	5.91E-04	1.49E-02
512	239750.00	4081250.00	Worker	0.10	8.88E-04	2.07E-02
513	241250.00	4081250.00	Residential	0.30	5.79E-04	2.04E-02
514	241500.00	4081250.00	Residential	0.19	3.45E-04	1.35E-02
515	239750.00	4081500.00	Worker	0.07	7.78E-04	1.87E-02
516	240000.00	4081500.00	Worker	0.09	1.08E-03	2.86E-02
517	241250.00	4081500.00	Residential	0.18	3.24E-04	1.51E-02
518	241500.00	4081500.00	Residential	0.13	2.42E-04	1.18E-02
519	239750.00	4081750.00	Worker	0.04	4.55E-04	1.37E-02
520	240000.00	4081750.00	Worker	0.04	4.73E-04	1.67E-02
521	240250.00	4081750.00	Worker	0.04	5.07E-04	2.28E-02
522	240500.00	4081750.00	Worker	0.04	4.84E-04	2.41E-02
523	240750.00	4081750.00	Worker	0.03	4.07E-04	1.63E-02
524	241000.00	4081750.00	Worker	0.03	3.11E-04	1.43E-02
525	241250.00	4081750.00	Worker	0.02	2.06E-04	7.26E-03
526	240250.00	4082000.00	Worker	0.03	3.14E-04	1.61E-02
527	240500.00	4082000.00	Worker	0.02	2.83E-04	1.70E-02
528	240750.00	4082000.00	Worker	0.02	2.14E-04	9.34E-03
529	241000.00	4082000.00	Worker	0.02	1.97E-04	9.12E-03
531	240000.00	4079000.00	Residential	0.11	1.17E-04	1.13E-02
532	240500.00	4079000.00	Residential	0.12	1.17E-04	5.29E-03
534	241500.00	4079000.00	Worker	0.03	1.66E-04	4.38E-03
535	239000.00	4079500.00	Worker	0.02	1.27E-04	4.82E-03
536	239500.00	4079500.00	Residential	0.16	1.40E-04	6.09E-03
537	240000.00	4079500.00	Residential	0.18	1.69E-04	1.22E-02
538	240500.00	4079500.00	Residential	0.20	1.85E-04	7.77E-03
539	241000.00	4079500.00	Worker	0.04	2.33E-04	6.84E-03
540	241500.00	4079500.00	Worker	0.04	2.96E-04	5.94E-03
541	242000.00	4079500.00	Residential	0.26	3.27E-04	5.14E-03
542	239000.00	4080000.00	Worker	0.04	2.00E-04	9.39E-03
543	239500.00	4080000.00	Residential	0.31	2.36E-04	8.10E-03
544	241500.00	4080000.00	Residential	0.52	6.30E-04	9.12E-03
545	242000.00	4080000.00	Residential	0.31	5.09E-04	7.01E-03
546	242500.00	4080000.00	Residential	0.18	3.15E-04	4.97E-03
547	238500.00	4080500.00	Worker	0.03	2.11E-04	5.99E-03
548	239000.00	4080500.00	Worker	0.05	3.10E-04	8.05E-03
549	242000.00	4080500.00	Residential	0.26	4.65E-04	7.27E-03
550	242500.00	4080500.00	Residential	0.13	2.32E-04	4.82E-03
551	238500.00	4081000.00	Worker	0.03	2.16E-04	6.32E-03
552	239000.00	4081000.00	Worker	0.05	3.37E-04	9.15E-03
553	242000.00	4081000.00	Residential	0.14	2.48E-04	7.95E-03
554	242500.00	4081000.00	Residential	0.08	1.40E-04	5.17E-03
555	238500.00	4081500.00	Worker	0.03	1.93E-04	5.51E-03
556	239000.00	4081500.00	Worker	0.04	3.05E-04	8.05E-03
557	239500.00	4081500.00	Worker	0.06	5.54E-04	1.36E-02
558	242000.00	4081500.00	Residential	0.08	1.41E-04	6.58E-03
559	242500.00	4081500.00	Residential	0.06	9.08E-05	5.32E-03
560	239000.00	4082000.00	Worker	0.02	2.36E-04	7.16E-03
561	239500.00	4082000.00	Worker	0.03	2.89E-04	1.04E-02

Table F-2. Operational Health Risk Assessment Results for All Receptors
Costco Commercial Center
Fresno, California

Receptor ID	X-Coordinate (m)	Y-Coordinate (m)	Receptor Type	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
562	240000.00	4082000.00	Worker	0.03	3.06E-04	1.40E-02
563	241500.00	4082000.00	Residential	0.07	1.17E-04	4.59E-03
564	242000.00	4082000.00	Residential	0.05	8.31E-05	4.64E-03
565	239500.00	4082500.00	Worker	0.02	1.54E-04	8.74E-03
566	240000.00	4082500.00	Worker	0.01	1.60E-04	9.83E-03
567	240500.00	4082500.00	Worker	0.01	1.39E-04	1.09E-02
568	241000.00	4082500.00	Worker	0.01	1.09E-04	5.67E-03
569	241500.00	4082500.00	Worker	0.01	7.84E-05	3.99E-03
570	242000.00	4082500.00	Worker	0.01	5.47E-05	2.37E-03
571	240000.00	4083000.00	Worker	0.01	9.94E-05	6.33E-03
572	240500.00	4083000.00	Worker	0.01	8.30E-05	6.25E-03
573	241000.00	4083000.00	Worker	0.01	6.95E-05	3.76E-03
574	240982.00	4080428.00	Sensitive	1.57	1.33E-03	2.03E-02
575	241114.00	4080505.00	Sensitive	1.29	1.86E-03	2.12E-02
576	241812.00	4080393.00	Sensitive	0.38	6.92E-04	9.51E-03
577	239709.00	4079647.00	Sensitive	0.20	1.68E-04	7.28E-03
578	239709.00	4079647.00	Sensitive	0.20	1.68E-04	7.28E-03
579	242094.00	4081102.00	Sensitive	0.11	1.85E-04	7.31E-03
580	242489.00	4081376.00	Sensitive	0.06	9.66E-05	4.68E-03
581	241998.00	4079399.00	Sensitive	0.25	2.98E-04	4.83E-03
582	242523.00	4080146.00	Sensitive	0.16	2.87E-04	4.45E-03
583	240160.00	4078896.00	Sensitive	0.11	1.08E-04	4.84E-03
584	242576.00	4081764.00	Sensitive	0.05	7.56E-05	3.92E-03
585	242632.00	4080241.00	Sensitive	0.14	2.39E-04	4.28E-03

Abbreviations:
m - meter

APPENDIX G
CO HOTSPOTS

Table G-1: Level of Service Summary
Costco Commerical Center
Fresno, California

Intersection No.	Location	Level of Service			
		Scenario 1:	Scenario 2:	Scenario 3:	Scenario 4:
		Existing Conditions	Existing Plus Project Conditions	Existing Plus Project Conditions with Off-Site Improvements	Future Conditions
		AM Peak Hour			
1	N Riverside Dr/W Spruce St	A	A	--	A
2	N Riverside Dr/W Fir Ave	A	B	A	A
3	N Riverside Dr/W Herndon Ave	C	E	C	A
4	N Golden State Blvd/W Herndon Ave	C	C	C	C
5	SR 99 NB Off-Ramp/ W Herndon Ave	B	B	--	B
6	N Parkway Dr/W Herndon Ave	C	C	--	C
A	N Riverside Dr/ Site Access A	--	A	--	--
C	N Riverside Dr/ Site Access C	--	A	--	--
D	Site Access D/ W Herndon Ave	--	B	--	--
		PM Peak Hour			
1	N Riverside Dr/W Spruce St	A	B	--	A
2	N Riverside Dr/W Fir Ave	A	F	C	A
3	N Riverside Dr/W Herndon Ave	E	F	D	E
4	N Golden State Blvd/W Herndon Ave	C	E	D	D
5	SR 99 NB Off-Ramp/ W Herndon Ave	C	D	--	B
6	N Parkway Dr/W Herndon Ave	C	C	--	B
A	N Riverside Dr/ Site Access A	--	A	--	--
C	N Riverside Dr/ Site Access C	--	A	--	--
D	Site Access D/ W Herndon Ave	--	C	--	--
		Saturday Peak Hour			
1	N Riverside Dr/W Spruce St	A	B	--	A
2	N Riverside Dr/W Fir Ave	A	F	C	A
3	N Riverside Dr/W Herndon Ave	C	F	D	C
4	N Golden State Blvd/W Herndon Ave	C	E	D	C
5	SR 99 NB Off-Ramp/ W Herndon Ave	B	C	--	A
6	N Parkway Dr/W Herndon Ave	B	C	--	B
A	N Riverside Dr/ Site Access A	--	A	--	--
C	N Riverside Dr/ Site Access C	--	A	--	--
D	Site Access D/ W Herndon Ave	--	C	--	--

Table G-1: Level of Service Summary
Costco Commerical Center
Fresno, California

Intersection No.	Location	Level of Service			
		Scenario 5:	Scenario 6:	Scenario 7:	Scenario 8:
		Future Plus Project Conditions	Future Plus Project with Reclassification Conditions with Off-Site Improvements	Future Plus Project Conditions without Reclassification of W Herndon Ave	Future Plus Project Conditions without Reclassification of W Herndon Ave with Off-Site Improvements
		AM Peak Hour			
1	N Riverside Dr/W Spruce St	A	--	A	--
2	N Riverside Dr/W Fir Ave	B	A	C	A
3	N Riverside Dr/W Herndon Ave	E	C	E	C
4	N Golden State Blvd/W Herndon Ave	C	C	C	C
5	SR 99 NB Off-Ramp/ W Herndon Ave	B	--	B	--
6	N Parkway Dr/W Herndon Ave	C	--	C	--
A	N Riverside Dr/ Site Access A	A	--	A	--
C	N Riverside Dr/ Site Access C	A	--	A	--
D	Site Access D/ W Herndon Ave	B	--	--	--
		PM Peak Hour			
1	N Riverside Dr/W Spruce St	B	--	B	--
2	N Riverside Dr/W Fir Ave	F	B	F	C
3	N Riverside Dr/W Herndon Ave	F	D	F	D
4	N Golden State Blvd/W Herndon Ave	E	D	E	D
5	SR 99 NB Off-Ramp/ W Herndon Ave	B	--	B	--
6	N Parkway Dr/W Herndon Ave	B	--	B	--
A	N Riverside Dr/ Site Access A	A	--	A	--
C	N Riverside Dr/ Site Access C	A	--	A	--
D	Site Access D/ W Herndon Ave	C	--	--	--
		Saturday Peak Hour			
1	N Riverside Dr/W Spruce St	B	--	B	--
2	N Riverside Dr/W Fir Ave	F	C	F	D
3	N Riverside Dr/W Herndon Ave	F	D	F	D
4	N Golden State Blvd/W Herndon Ave	E	D	E	D
5	SR 99 NB Off-Ramp/ W Herndon Ave	B	--	B	--
6	N Parkway Dr/W Herndon Ave	B	--	B	--
A	N Riverside Dr/ Site Access A	A	--	A	--
C	N Riverside Dr/ Site Access C	A	--	A	--
D	Site Access D/ W Herndon Ave	B	--	--	--