

5 AIR QUALITY AND ODORS

This chapter provides an evaluation of the generation and influence of air pollutant emissions and odors generated by the proposed Oliveira Dairy Expansion project. As established in the Initial Study (IS) for the proposed project (see Appendix A, *Notice of Preparation and Initial Study*), the construction and operation of the Oliveira Dairy Expansion could result in the generation of air pollutants and nuisance odors.

The technical analysis of air quality and odors prepared for this EIR has been conducted to comply with the requirements of the San Joaquin Valley Air Pollution Control District (SJVAPCD), the Merced County 2030 General Plan, and the Animal Confinement Ordinance (ACO). Merced County adopted mitigation measures and study protocols in its certification of the 2030 Merced County General Plan EIR and the EIR for Revisions to the ACO, and in its approval of the ACO. The following evaluation implements, and is consistent with, these mitigation measures and study protocols.

INTRODUCTION

Air Quality

Air quality influences public health and welfare, the economy, and quality of life. Air pollutants have the potential to adversely impact public health, the production and quality of agricultural crops, visibility, native vegetation, and buildings and structures.

Appendix F, *Air Quality Technical Appendix*, presents the environmental setting of air quality for Merced County and the San Joaquin Valley Air Basin. This technical appendix includes a description of the physical environmental factors influencing air quality, trends in criteria air pollutants, and related health effects.

Criteria pollutants are those that are regulated by either the state or federal Clean Air Acts. Non-criteria pollutants are not regulated by these Acts, but are a concern as precursors to criteria pollutants and/or for their potential for harm or nuisance.

The criteria pollutants of most interest in the San Joaquin Valley associated with dairy sources are ozone and particulates (dust). Ozone is not emitted directly into the environment; rather, it is generated from complex chemical reactions in the presence of sunlight between reactive organic gases (ROG) (or non-methane hydrocarbons), and oxides of nitrogen (NO_x). Ozone is a powerful respiratory irritant. Particulate matter is classified as respirable particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}). Exposure to elevated levels of particulate matter causes irritation of the eyes and respiratory system, and exposure is implicated in increased levels of disease and death.

Important non-criteria pollutants include air toxics. Air toxics are generated from industrial processes (e.g., gas stations, dry cleaners, or car repairs), mobile sources using diesel engines, and agricultural sources such as dairies.

Odors

Odors associated with dairy and other animal confinement operations are primarily generated from manure and silage. Odor from these operations is the composite of as many as 170 or more specific gases, including ammonia, hydrogen sulfide, amines, organic acids, and heterocyclic nitrogen-bearing compounds. The odor characteristics that contribute to nuisance conditions include the intensity, concentration or strength of the odor, the odor frequency, the duration that the odor remains detectable, and the perceived offensiveness and character or quality of the odor.

5.1 REGULATORY FRAMEWORK

5.1.1 FEDERAL REGULATORY FRAMEWORK

AIR QUALITY

The United States Environmental Protection Agency (EPA) is responsible for enforcing the many federal environmental and hazardous waste laws, including the federal Clean Air Act (CAA). California is under the jurisdiction of EPA Region IX, with offices in San Francisco. The CAA, established in 1963, was substantially modified in 1970 and again amended in 1990 to authorize the establishment of national health-based air quality standards, set deadlines for their attainment, and establish actions required of areas in the nation that exceeded these standards. Under the CAA, state and local agencies in areas that exceed the National Ambient Air Quality Standards (NAAQS) are required to develop state implementation plans (SIP) to show how they will achieve the NAAQS for ozone and particulate matter by specified dates (42 USC 7409, 7411). The EPA's responsibility to control air pollution in individual states is primarily to review submittals of SIPs that are prepared by each state.

The EPA requires that farms operating diesel-powered engines for farming operations submit an application for permit under Title V of the CAA if emissions from the engines exceed half of the major source threshold. Title V permits are operating permits issued by state or local permitting authorities to mostly large sources and some smaller sources of air pollution. Other agricultural operations, including animal confinement facilities over a certain size, are also required to apply for a Title V permit. Issuance of the Title V permit in California is delegated to California air districts.

ODOR CONTROL

No federal laws exist for odor emissions; regulation is achieved through County ordinances, and enforced based upon complaints.

5.1.2 STATE OF CALIFORNIA REGULATORY FRAMEWORK

AIR QUALITY

In California, the California Air Resources Board (ARB) is responsible for preparing and enforcing the federally-required SIP in an effort to achieve and maintain NAAQS and California Ambient Air Quality Standards (CAAQS), which were developed as part of the California Clean Air Act (CCAA) adopted in 1988. CAAQS for criteria pollutants equal or surpass NAAQS, and include other pollutants for which there are no NAAQS. In addition, the ARB is responsible for assigning air

basin attainment and nonattainment designations in California. Air basins are designated as being in attainment if the levels of a criteria air pollutant meet the NAAQS or CAAQS for the pollutant, and are designated as being in nonattainment if the level of a criteria air pollutant is higher than the corresponding NAAQS or CAAQS.

The ARB is the oversight agency responsible for regulating statewide air quality, but implementation and administration of NAAQS and CAAQS is delegated to several regional Air Pollution Control Districts (APCD) and Air Quality Management Districts (AQMD). These districts have been created for specific air basins, and have principal responsibility for:

- Developing plans to meet CAAQS and NAAQS;
- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain CAAQS and NAAQS;
- Implementing permit programs established for construction, modification, and operation air pollution sources;
- Enforcing air pollution statutes and regulations governing non-vehicular sources; and,
- Developing employer-based trip reduction programs.

To regulate air pollutant emissions within California, the state has been divided into 15 Air Basins based upon similar meteorological and geographic conditions, and consideration for political boundary lines whenever practicable. Merced County is located in the San Joaquin Valley Air Basin (SJVAB), which is the second largest air basin in California. This Air Basin also includes San Joaquin County, Stanislaus County, Madera County, Fresno County, Kings County, Tulare County, and a portion of Kern County (see Figure 5-1).

Any stationary source equipment used in agricultural operations in the growing of crops or the raising of animals that may cause emissions of air contaminants is required by state law to obtain a permit from the local Air Pollution Control District.

ODOR CONTROL

No state laws exist for odor emissions; regulation is achieved through County ordinances, and enforced based upon complaints.

5.1.3 SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

The SJVAPCD is the lead air quality regulatory agency for the San Joaquin Valley Air Basin. The SJVAPCD has jurisdiction over all point and area sources of air emissions except for mobile sources (such as motor vehicles), consumer products, and pesticides. The SJVAPCD and ARB have joint responsibility for attaining and maintaining the NAAQS and CAAQS in the Air Basin.

The SJVAPCD is required to prepare ozone and PM_{2.5} attainment demonstration plans to identify the regulatory framework necessary to bring the San Joaquin Valley into compliance with the ozone and PM_{2.5} NAAQS. These attainment plans are described below.

The SJVAPCD is a CEQA Responsible Agency for the proposed Oliveira Dairy Expansion project via the SJVAPCD Permits Required Rule (Rule 2010) and New Source Review Rule (Rule 2201) (State CEQA Guidelines Section 15381).



SOURCE: SJVAPCD, 2012; Planning Partners, 2019

Oliveira Dairy Expansion Project CUP16-005

Figure 5-1
San Joaquin Valley Air Basin

OZONE ATTAINMENT DEMONSTRATION PLAN (OZONE PLAN)

The SJVAB is designated as an extreme ozone nonattainment area for the EPA’s 2008 8-hour ozone standard of 75 parts per billion (ppb). The SJVAPCD 2016 Ozone Plan addresses the EPA’s 2008 8-hour ozone standard and identifies strategies to reduce NO_x emissions by over 60 percent between 2012 and 2031. The plan demonstrates attainment by no later than December 31, 2031.

The EPA set the newest NAAQS for 8-hour ozone at 70 ppb effective December 28, 2015. EPA has designated the San Joaquin Valley as Extreme Nonattainment for this standard. Addressing the 2015 8-hour ozone standard will pose a tremendous challenge for the San Joaquin Valley, given the naturally high background ozone levels and ozone transport into the region (SJVAPCD 2018).

The control measures included in the attainment plan apply to currently regulated sources under SJVAPCD jurisdiction, but the cooperation of other federal, state, and local agencies is required to achieve attainment with federal ozone standards. The EPA and ARB are responsible for emission controls of aircraft, farming equipment, pesticides, consumer products, and motor vehicles that significantly contribute to the ozone pollution in the Air Basin.

Although EPA revoked its 1979 1-hour ozone standard in June 2005, many planning requirements remain in place, and the SJVAB must still attain this standard. The SJVAPCD 2013 Plan for the Revoked 1-Hour Ozone Standard (2013 Ozone Plan) includes modeling confirming that the SJVAB attained EPA’s 1-hour standard by 2017. Thus, the SJVAB now meets the 1-hour ozone standard based on air monitoring data. On June 30, 2016, EPA took final action determining that the San Joaquin Valley has attained the 1-hour ozone national ambient air quality standard (SJVAPCD 2018; EPA 2018).

PM₁₀ PLAN

Based on a decline in PM₁₀ emissions, the San Joaquin Valley became the first air basin classified as “serious nonattainment” to be reclassified by EPA as in “attainment” of the PM₁₀ standards. The SJVAPCD adopted the 2007 PM₁₀ Maintenance Plan to assure the San Joaquin Valley’s continued attainment of EPA’s PM₁₀ standard.

PM_{2.5} PLAN

The San Joaquin Valley is classified as “serious” nonattainment for federal PM_{2.5} (fine particulate matter) standards. The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 PM_{2.5} Standards on November 15, 2018. This plan addresses the EPA federal 1997 annual PM_{2.5} standard of 15 µg/m³ and 24-hour PM_{2.5} standard of 65 µg/m³; the 2006 24-hour PM_{2.5} standard of 35 µg/m³; and the 2012 annual PM_{2.5} standard of 12 µg/m³. This Plan includes aggressive incentive-based control measures that achieve the massive emissions reductions needed to bring the Valley into attainment and will require significant funding estimated at \$5 billion.

SJVAPCD RULES AND REGULATIONS APPLICABLE TO DAIRIES

Rule 2010 Permits Required. SJVAPCD Rule 2010 applies to agricultural uses, including dairies, and states that “any person who plans to or does operate, construct, alter, or replace any source of emission of air contaminants” must obtain the approval of the Air Pollution Control Officer and

receive an Authority to Construct (ATC) and a Permit to Operate (PTO). The SJVAPCD requires an ATC/PTO for new animal confinement facilities with emissions in excess of five tons¹ per year² of volatile organic compounds (VOC), which is often referred to as reactive organic gases³, or for expanding facilities with an existing ATC/PTO. An ATC must be obtained before building or installing a new emissions unit or modifying an existing emissions unit that requires a permit. A PTO is issued after all construction is completed and the emission unit is ready for operation.

Dairy operations with non-fugitive emissions that exceed 10 tons/year for VOC and NO_x by either exceeding milk cow equivalents or from multiple agricultural engine emissions are required to obtain a federal Title V permit in compliance with the CAA. The SJVAPCD manages the Title V permit process, and issues both the District and Title V permit as a single permit. Emission estimates that contribute toward determining if a facility is subject to Title V permitting would include non-fugitive emissions from animal feeding operations, stationary internal combustion engines, and any other stationary equipment that may emit air contaminants. The process for obtaining a Title V permit involves additional steps beyond obtaining an ATC/PTO.

The ATC/PTO permit process is separate from the Conservation Management Practice (CMP) plans (see Rule 4550 below). However, if a facility submits their PTO application and CMP plan at the same time, the SJVAPCD will process the two permits concurrently. If a source requires both a CMP and PTO, the SJVAPCD will not charge any CMP fees for that facility (Rule 3190, Section 4.0).

Regulation VIII Fugitive PM₁₀ Prohibitions: Rules 8011-8081. Regulation VIII includes specific emission control strategies for fugitive dust from construction/demolition, bulk materials, carryout, open areas, paved and unpaved roads, equipment on unpaved roads, paved road dust, fugitive windblown dust, and farming operations. Regulation VIII Rules 8011-8081, including preparation of a dust control plan, apply to the Oliveira Dairy Expansion project and are designed to reduce PM₁₀ emissions.

Rule 2201: New and Modified Source Review. New sources of air pollution, and modifications of existing sources, must comply with District Rule 2201, also known as New Source Review (NSR). The NSR rule provides the mechanism for the District to issue permits to new and expanding businesses without interfering with efforts to meet the state and federal health-based air quality standards. NSR contains several main requirements – Best Available Control Technology (BACT), Best Available Retrofit Control Technology (BARCT), and offsets. However, agricultural sources are generally exempt from offsets, unless that agricultural source is also a major stationary source. If total operations of new dairies exceed five tons per year of emissions (i.e., VOCs and NO_x), NSR rules apply. This triggers BACT and BARCT for the new “emissions sources,” applied through the

¹ A United States ton, or short ton, is equal to 2,000 pounds (907 kg), while a metric ton, or tonnes, is equal to 2,205 pounds (1,000 kg).

² District Rule 2020, Exemptions, Section 6.20.1, exempts Agricultural sources that, in aggregate, produce actual emissions less than one-half of the major source thresholds (10 tons/year for NO_x and VOC).

³ The EPA defines volatile organic compounds (VOC) as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. The California Air Resources Board uses the term reactive organic gases (ROG) in its emission inventory, which means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate. However, not all identified VOCs are ROG, as some are non-reactive hydrocarbons that may not significantly contribute to ozone formation.

ATC and PTO permits. If any existing source makes modifications to its operations, and those modifications generate two pounds or more per day of any criteria emissions, the NSR is also triggered.

Rule 3135: Dust Control Plan Fee. This rule requires the applicant to submit a fee in addition to a dust control plan (per Rules 8011-8081).

Rule 4002: (National Emission Standards for Hazardous Air Pollutants). In the event that any portion of an existing building will be renovated, partially demolished, or removed, the project will be subject to District Rule 4002. Prior to any demolition activity, an asbestos survey of existing structures on the project site may be required to identify the presence of any asbestos containing building material (ACBM). In accordance with CAL-OSHA requirements, a certified asbestos contractor must remove any identified ACBM having the potential for disturbance.

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 District enforcement action. Odors emanating from agricultural operations, however, are exempt.

Rule 4550: Conservation Management Practices. The purpose of this rule is to limit fugitive dust emissions from agricultural operations. The rule outlines requirements for owner/operators of agricultural operations to prepare CMP plans for all agricultural producers with 100 contiguous acres or more to reduce dust emissions in areas of crop production, animal feeding operations, and unpaved roads/equipment areas.

Rule 4570: Confined Animal Facilities. Rule 4570 requires that all owners/operators of any Confined Animal Facility (CAF) shall submit a permit application for each CAF – this applies to dairies with greater than or equal to 500 milk cows. The application shall include an emission mitigation plan that lists the VOC mitigation measures that the facility will use to comply with all applicable requirements of Rule 4570. All dairies that are currently subject to the rule must comply with Phase II mitigation measures. These mitigation measures include management practices that minimize the formations of VOCs or control VOCs by moving the VOC-forming material to a controlled situation. Examples of management practice type mitigation measures are feed manipulation, frequent scraping of animal housing, and covering of silage piles. Operators must choose a certain number of management practices from a limited menu of options for each operation (for a list of mitigation options, see Appendix D).

Rule 4601: Architectural Coatings. This rule applies if there are any architectural coatings applied to structures. The purpose of this rule is to limit VOC emissions from architectural coatings. This rule specifies architectural coatings storage, cleanup, and labeling requirements.

Rule 4641: Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations. The purpose of this rule is to limit VOC emissions by restricting the application and manufacturing of certain types of asphalt for paving and maintenance operations.

Rule 4702: Internal Combustion Engines – If internal combustion engines or spark-ignited internal combustion engines (such as diesel generators) are used as part of the dairy operations, these rules limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), sulfur oxides (SO_x), and

VOC from internal combustion engines or spark-ignited internal combustion engines rated at 25 brake horsepower or greater.

SJVAPCD Policy for Risk Management Review: The purpose of a Risk Management Review (RMR) is to ensure on-going compliance with the Air Toxics “Hot Spots” information and Assessment Act of 1987 (AB 2588). SJVAPCD’s Technical Services performs the RMRs for dairies being permitted by the District for those activities covered under the permits. The health risk assessment addresses emissions from: ammonia; hydrogen sulfide; particulate matter and its toxics components (e.g., aluminum, lead, manganese, nickel, etc.); and xylenes, formaldehydes, carbon tetrachloride, and other components from VOCs.

ODOR CONTROL

The SJVAPCD 2015 *Guide for Assessing Air Quality Impacts* (GAMAQI) includes a screening tool for odor sources to qualitatively assess a project’s potential to adversely affect area receptors. According to the screening tool, if there are sensitive receptors (e.g., hospitals, schools, and residential areas) within one mile of a feed lot or dairy, then a more detailed investigation should be provided due to a greater possibility of nuisance⁴. Because of the subjective nature of odor impacts, the many variables that can influence odors, and the many types of odor sources, the SJVAPCD does not prescribe any quantitative methodologies to determine if potential odors would have a significant impact. Rather, lead agencies are encouraged to make a determination of significance based on a review of complaint records. The SJVAPCD defines a significant odor problem as more than one confirmed complaint per year or three unconfirmed complaints per year averaged over a three-year period.

5.1.4 MERCED COUNTY

Chapter 18.48.050, Sections U and HH⁵ of the Merced County Animal Confinement Ordinance (see Appendix C) require compliance with requirements of the SJVAPCD and reduction of air emissions as set forth below.

18.48.050 General

- U. The animal confinement facility and access roads shall meet the requirements of the San Joaquin Valley Unified Air Pollution Control District.
- HH. New or expanding animal confinement facilities shall provide and maintain one or more of the following dust control measures on unpaved roads within the facility area:
 - 1. A uniform layer of washed gravel; or
 - 2. Chemical/organic dust suppressants; or
 - 3. Vegetative materials; or
 - 4. Paving; or
 - 5. Any other method that effectively limits visible dust emissions to 20% opacity.

⁴ Odors emanating from agricultural operations such as dairies are exempt from District Rule 4102 Nuisance.

⁵ As noted above, the SJVAPCD has adopted Rules 4550 and 4570 for the control of PM₁₀ and ROG emissions from dairies, thereby voiding Section 18.48.050 OO of the Animal Confinement Ordinance that previously applied.

MERCED COUNTY GENERAL PLAN

The Air Quality Element of the Merced County General Plan contains goals and policies pertaining to protection of air quality in Merced County. Those policies that are relevant to the proposed project are presented below:

Policy AQ-2.2: Development Review Process

Use the development review process to achieve measurable reductions in criteria pollutant, toxic air contaminants, and greenhouse gas emissions.

Policy AQ-2.3: Cumulative Impacts

Encourage the reduction of cumulative air quality impacts produced by projects that are not significant by themselves, but result in cumulatively significant impacts in combination with other development.

Policy AQ-2.4: Mitigation

Require that local and regional air quality impacts identified during CEQA review for projects reviewed and approved by the County are consistently and fairly mitigated.

Policy AQ-2.5: Innovative Mitigation Measures

Encourage innovative mitigation measures and project redesign to reduce air quality impacts by coordinating with the San Joaquin Valley Air Pollution Control District, project applicants, and other interested parties.

Policy AQ-2.7: Air District Best Performance Standards

Require the County to use the Best Performance Standards adopted by SJVAPCD during the development review and decision-making process to ensure new projects meet the targets set by the district.

Policy AQ-6.1: Particulate Emissions from Construction

Support the San Joaquin Valley Air Pollution Control District's efforts to reduce particulate emissions from construction, grading, excavation, and demolition to the maximum extent feasible and consistent with State and Federal regulations.

Policy AQ-6.8: Voluntary Emissions Reduction Agreement

Require all project applicants, where project emissions have been evaluated to exceed SJVAPCD significance thresholds, to consult with the SJVAPCD regarding the establishment of a Voluntary Emissions Reduction Agreement between the applicant and the SJVAPCD. Support the SJVAPCD in its efforts to fund the Emission Reduction Incentive Program.

These policies were considered in the evaluation of the proposed project and the formulation of appropriate mitigation measures below. A more detailed discussion of the relevance of these policies to the proposed project is located in Table 11-1 of Chapter 11, *Land Use Compatibility*.

ODOR CONTROL

Merced County uses a setback approach to odor nuisance control, requiring setbacks between animal confinement facilities and other uses of 0.5 mile for urban areas and sensitive uses, and 1,000 feet for isolated rural residences. The following provisions of the ACO (see Appendix C) seek to minimize nuisance effects from odors.

18.48.040, Locational Criteria

B. OTHER LOCATIONAL CRITERIA

1. New Facilities

- a. The new facility shall be located more than one-half mile from the nearest boundary of the following: Specific Urban Development Plan, Rural Residential Center, Highway Interchange Center, or Agricultural Services Center; residentially designated property in the General Plan or residentially zoned property; sensitive uses such as schools, hospitals, jails, public parks, Federal or State owned and managed wildlife areas; or concentrations of five or more offsite residences, provided that to qualify as a “concentration,” residences must be legally established, occupied, located within a contiguous area and must equal or exceed a density of one dwelling unit per acre.

Any of the previously mentioned urban boundaries shall not include areas for municipal uses such as wastewater treatment facilities, airports, or solid waste recycling or disposal facilities located outside urban areas.

- b. The new facility shall be located at least 1,000 feet from any off-site residence, except that any new facility may locate closer than 1,000 feet from an off-site residence with written permission from the off-site property owner(s). New goat facilities shall be located at least 500 feet from any off-site residences.

2. Existing Facilities. For an existing facility, if the separation distances are less for the uses or boundaries described in subsection (B)(1) of this section, modification or expansion of the facility must not decrease the existing separation distance, except that expansion or modification of existing facilities may occur if the separation distance is less than one thousand (1,000) feet from on offsite residence and if the offsite property owner(s) provides written permission.

18.48.055 Comprehensive Nutrient Management Plan

- C. The CNMP shall contain the following components and other information as required by the Division of Environmental Health:

8. Operation and Maintenance of the Facility

- a. Describe odor control measures.

The Merced County Code also includes a Right-to-Farm Ordinance (Chapter 17.08.080(H)) that seeks to reduce the opposition of residential neighbors to nuisances created by commercial farming, such as odors. Since 1986, Merced County’s Right-to-Farm Ordinance has been administered by the Community and Economic Development Department (CEDD). The Ordinance is an educational and disclosure measure, not a regulatory requirement. It informs purchasers of property during the residential development process, when subdivisions or parcel splits are approved and building permits are issued, about the local importance of agriculture and the possible negative impacts of locating residences near common farm operations.

The Merced County General Plan contains policies that seek to reduce nuisance conditions consistent with the ACO measures and Right-to-Farm Ordinance cited above. Those policies that are relevant to the proposed project are presented below:

Policy AG-3.1: Right-to-Farm Ordinance

Continue to implement the Right-to-Farm Ordinance to define and limit instances where agricultural operations may be considered a nuisance to surrounding rural residential, residential or urban development.

Policy AG-3.9: New Confined Animal Facility Location Requirements

Require new or expanded confined animal facilities to be located, at a minimum:

- a) One-half mile from any Rural Center or Urban Community boundary; residentially-designated or zoned property; sensitive uses such as schools, hospitals, jails, Federal wildlife areas, State wildlife areas, and public parks; or concentrations of five or more off-site residences. This does not include areas for municipal uses such as wastewater treatment facilities, airports, or solid waste recycling or disposal facilities located outside urban areas; and
- b) One thousand feet from any off-site residence, unless there is written permission from the off-site property owner.

These policies were considered in the evaluation of the proposed project and the formulation of appropriate mitigation measures below. A more detailed discussion of the relevance of these policies to the proposed project is located in Table 11-1 of Chapter 11, *Land Use Compatibility*.

5.1.5 AIR QUALITY STANDARDS

The EPA has set NAAQS for ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, respirable particulate matter (PM₁₀), and airborne lead. In addition to the NAAQS, the ARB has established CAAQS to protect public health and welfare. Standards have been set for ozone, sulfur dioxide, PM₁₀, sulfates, airborne lead, hydrogen sulfide, and vinyl chloride, at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases. An area where the standard for a pollutant is exceeded is considered a nonattainment area, and is subject to planning and pollution control requirements that are more stringent than normal requirements. The ARB is responsible for assigning air basin attainment and nonattainment designations for federal and state criteria pollutants.

State and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies on the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (i.e., one hour), or to a relatively lower average concentration over a longer period (e.g., eight hours, 24 hours, or one month). For some pollutants, there is more than one air quality standard, reflecting both its short-term and long-term effects.

Table 5-1 presents the CAAQS and NAAQS for selected pollutants. Table 5-2 summarizes the attainment status of the Air Basin. Of the criteria pollutants, the Air Basin is in nonattainment for ozone, PM_{2.5}, and state PM₁₀. As discussed above, the SJVAPCD has enacted plans designed to bring the basin back to attainment status for ozone and PM_{2.5}.

Table 5-1 Federal and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards Concentration	Federal Primary Standards Concentration
Ozone (O ₃)	8-hour	0.07 ppm (137 µg/m ³)	0.070 ppm (137 µg/m ³)
	1-hour	0.09 ppm (180 µg/m ³)	---
Respirable Particulate Matter (PM ₁₀)	24-hour	50 µg/m ³	150 µg/m ³
	Annual Arithmetic Mean	20 µg/m ³	---
Fine Particulate Matter (PM _{2.5})	24-hour	---	35 µg/m ³
	Annual Average	12 µg/m ³	12 µg/m ³
Carbon Monoxide	8-hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)
	1-hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)
Nitrogen Dioxide	Annual Average	0.03 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)
	1-hour	0.18 ppm (339 µg/m ³)	0.100 ppm (188 µg/m ³)
Lead	30 day Average	1.5 µg/m ³	---
	Rolling 3-Month Average	---	0.15 µg/m ³
	Quarterly Average	---	1.5 µg/m ³
Sulfur Dioxide	24-hour	0.04 ppm (105 µg/m ³)	0.14 ppm (for certain areas)
	3-hour	---	---
	1-hour	0.25 ppm (655 µg/m ³)	0.075 ppm (196 µg/m ³)
Sulfates	24-hour	25 µg/m ³	No Federal Standard
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m ³)	No Federal Standard
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m ³)	No Federal Standard

Notes: ppm = parts per million; mg/m³ = milligrams per cubic meter; µg/m³ = micrograms per cubic meter

Source: ARB 2016, EPA 2016.

Table 5-2 San Joaquin Valley Air Basin Attainment Status

Pollutant	State of California Attainment Status	Federal Attainment Status
Ozone – 1-hour	Nonattainment/Severe	Attainment ^a
Ozone – 8-hour	Nonattainment	Nonattainment/ Extreme
Respirable Particulate Matter (PM ₁₀)	Nonattainment	Attainment
Fine Particulate Matter (PM _{2.5})	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment	Attainment/Unclassified
Lead	Attainment	No designation
Sulfur Dioxide	Attainment	Attainment/Unclassified
Sulfates	Attainment	No Federal Standard
Hydrogen Sulfide	Unclassified	No Federal Standard

Notes:

^a On June 30, 2016, the EPA made a determination of attainment of the 1-hour ozone standard in the San Joaquin Valley.

Source: SJVAPCD 2017, EPA 2018b.

Appendix F, *Air Quality Technical Appendix* provides a discussion of criteria and non-criteria pollutants, the major sources of the pollutant, the pollutant's potential for adverse environmental

effects, ambient air quality data in the San Joaquin Valley and Merced County in terms of number of violations and concentration in the environment (for nonattainment criteria pollutants only), the amount of the pollutant emitted in the San Joaquin Valley and Merced County, the role of animal confinement facilities in the emissions, and potential human health effects.

5.2 ENVIRONMENTAL SETTING

5.2.1 AIR QUALITY

AIR QUALITY MONITORING

The San Joaquin Valley Air Basin's air quality monitoring network provides information on ambient concentrations of air pollutants. The SJVAPCD operates several monitoring stations in the SJVAB, including two stations in Merced County, where the air quality data for ozone, PM_{2.5}, and PM₁₀ were obtained. Table 5-3 compares a five-year summary of the highest annual criteria air pollutant emissions collected at these monitoring stations with applicable CAAQS, which are more stringent than the corresponding NAAQS. Due to the regional nature of these pollutants, ozone, PM_{2.5}, and PM₁₀ are expected to be fairly representative of the project area.

As indicated in Table 5-3, the O₃, PM_{2.5} and PM₁₀ federal and state standards have been exceeded in Merced County over the past five years, with the exception of the federal PM₁₀ standard, which was not exceeded.

Table 5-3 Annual Air Quality Data for Merced County Air Quality Monitoring Stations					
Pollutant	2013	2014	2015	2016	2017**
Ozone (O₃) 1-hour: Monitoring location: Merced County – S Coffee Avenue					
Maximum Concentration (ppm)	<u>0.100</u>	<u>0.100</u>	<u>0.102</u>	<u>0.097</u>	0.093
Days Exceeding State Standard (1-hr avg. > 0.09 ppm)	5	3	2	2	0
Ozone (O₃) 8-hour: Monitoring location: Merced County – S Coffee Avenue					
Maximum Concentration (ppm)	<u>0.092</u>	<u>0.088</u>	<u>0.090</u>	<u>0.087</u>	<u>0.085</u>
Days Exceeding State Standard (8-hr avg. > 0.070 ppm)	31	44	34	29	17
Days Exceeding National Standard (8-hr avg. > 0.075 ppm)	15	22	14	13	8
PM₁₀: Monitoring location: Merced County – 2334 M Street					
Days Exceeding State Standard (Daily Standard 50 µg/m ³)	*	*	31.8	38.9	76.6
Maximum State 24-Hour Concentration (µg/m ³)	<u>80.5</u>	<u>92.7</u>	<u>94.0</u>	<u>64.5</u>	<u>144.0</u>
Days Exceeding Federal Standard (Daily Standard 150 µg/m ³)	0	0	0	0	0
Maximum Federal 24-Hour Concentration (µg/m ³)	77.4	88.3	97.2	64.3	146.6
PM_{2.5}: Monitoring location: Merced County – 2334 M Street					
Days Exceeding National 2006 Standard (Daily Standard 35 µg/m ³)	35.5	18.2	15.2	6.3	20.4
Maximum National 24-Hour Concentration (µg/m ³)	<u>68.9</u>	<u>53.7</u>	<u>60.8</u>	<u>42.8</u>	<u>66.7</u>

Notes: Underlined Values in excess of applicable standard / ppm = parts per million / µg/m³ = micrograms per cubic meter.

*Insufficient data to determine the value

**2017 is the latest year of data available as of preparation of this chapter (December 2018).

Source: California Air Resources Board, 2018. *Air Quality Trend Summaries*. Accessed at <www.arb.ca.gov/adam>.

5.2.2 ODORS

The most significant source of nuisance odors from animal confinement facilities is the anaerobic decomposition of manure. Odor offensiveness varies with the moisture content of the manure. Studies have shown that pen odors have been found to increase up to 60 times under wet conditions (Augustin et al 2011).

Typically, the surface (aerobic) layer of feedlot manure and dairy waste ponds provides a physical barrier to atmospheric emission of the odors created by the underlying anaerobic layer. Further, the topography surrounding the dairy operation affects how and where odors move. Odorous air may be confined within depressions or valleys, and odors tend to move downhill under calm conditions. Odorous air will also either go around elevated areas or be dispersed more quickly when moved over higher and varied terrain (Henry and Stowell, undated).

The four basic approaches to control odor and odorants are diet manipulation, manure treatment, capture and treatment of emitted gases, and enhanced dispersion (USDA CLAQC 2000). Vegetative barriers such as purposefully planted linear arrangements of trees and shrubs can help obstruct, modify, absorb, and/or dissipate livestock odor plumes and other emissions prior to contact with people. Baseline data has shown that vegetative barriers can contribute up to 10 percent reduction in the movement of odor downwind (Tyndall and Colletti 2007). Vegetative barriers may also provide an aesthetic benefit, and could affect how people perceive agriculture and livestock odor.

Emissions from Animal Confinement Facilities. Though animal confinement facilities emit odors, the formation of odorous compounds is dependent upon a number of independent variables, including moisture content, aerobic versus anaerobic decomposition, and other aspects of manure management, local meteorology, and diet. Thus, it is not possible to develop an odor emission factor based on the number of head. However, it is probable that odor emission rates at a particular facility could increase with expanded operations and herd size.

Health Effects: A literature search conducted for the EIR prepared and certified by Merced County for Revisions to the Animal Confinement Ordinance indicated that no scientific studies have validated adverse health effects from dairy odors, though they can be a source of great nuisance.

Existing Sensitive Uses and Receptors: There are off-site single-family residences surrounding the project site and located within the windshed of the dairy (defined as an area of 1,320 feet upwind to 2,640 downwind of the periphery of the animal facility). The closest off-site residences are located approximately 610 and 700 feet south of active dairy facilities (see Figures 3-6 and 3-10 in Chapter 3, *Project Description*). The nearest Merced County school, McSwain Union Elementary School, is located approximately 1.5 miles to the north of the proposed project. (Impact AQ-7 evaluates the potential impacts from exposure of both on-site and off-site receptors to substantial pollutant concentrations from the emissions of air contaminants that cause odor.)

For the purpose of this document, **receptors** are defined as people – children, adults, and seniors – occupying or residing in:

- Residential dwellings;
- Schools;
- Daycares;
- Hospitals;
- Senior-care facilities.

Sensitive receptors are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and designated residential areas are examples of sensitive receptors.

Sensitive uses include jails, public parks, Federal or State owned and managed wildlife areas, in addition to sensitive receptors listed above.

5.3 ENVIRONMENTAL EFFECTS

5.3.1 SIGNIFICANCE CRITERIA

In accordance with Appendix G to the State CEQA Guidelines, Section III, Air Quality, this analysis considers impacts to be significant if implementation of a proposed action would:

- Conflict with or obstruct implementation of the applicable air quality plan. *(III.a)*
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard. *(III.b)*
- Expose sensitive receptors to substantial pollutant concentrations? *(III.c)*
- Result in other emissions (such as those leading to odors affecting a substantial number of people. *(III.d)*

SIGNIFICANCE THRESHOLDS

The SJVAPCD's GAMAQI (SJVAPCD 2015) has established thresholds for certain criteria pollutants for determining whether a project would have a significant air quality impact. Construction and operational emissions are calculated separately. The SJVAPCD significance thresholds are presented in Table 5-4.

Pollutant/Precursor	Threshold of Significance		
	Construction Emissions (tons/year)	Operational Emissions	
		Permitted Equipment and Activities (tons/year)	Non-Permitted Equipment and Activities (tons/year)
Reactive Organic Gases (ROG)	10	10	10
Oxides of Nitrogen (NO _x)	10	10	10
PM ₁₀	15	15	15
PM _{2.5}	15	15	15
Carbon Monoxide (CO)	100	100	100
Sulfur Oxide (SO _x)	27	27	27

Notes: The significance of the impacts of the emissions from construction, operational non-permitted equipment and activities, and operational permitted equipment and activities are evaluated separately. The thresholds of significance are based on a calendar year basis. For construction emissions, the annual emissions are evaluated on a rolling 12-month period.

Source: San Joaquin Valley Air Pollution Control District "Guidance for Assessing and Mitigating Air Quality Impacts" 2015.

In order to determine whether a project will cause or contribute significantly to an Ambient Air Quality Standard (AAQS) violation, the maximum impacts attributable to the project are added to the existing background concentrations and compared to the applicable ambient air quality standard. If an ambient air quality standard is not exceeded, the project is judged to not cause or contribute significantly to an AAQS violation for the applicable pollutant. If an ambient air quality standard is exceeded, it must be determined whether the project will cause a Prevention of Significant Deterioration (PSD) increment violation, which is achieved by comparing the maximum predicted concentration from the project to the established significant impact level (SIL) for the applicable pollutant. If a source's maximum impacts are below the PSD SIL, the project is judged to not cause

or contribute significantly to an AAQS violation or cause a PSD increment violation. The thresholds used in the Ambient Air Quality Analysis (AAQA) and Health Risk Assessment (HRA) are:

- In accordance with SJVAPCD policy, a local significance threshold of 10.4 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) may be applied to fugitive emissions of PM_{10} .
- The SJVAPCD level of significance for carcinogenic risk is twenty in one million (20×10^{-6}), which is understood as the possibility of causing twenty additional cancer cases in a population of one million people. The level of significance for acute and chronic non-cancer risk is a hazard index of 1.0.

In relation to objectionable odors, the Merced County CEDD uses a setback approach to odor nuisance control, requiring setbacks between animal confinement facilities and other uses of 0.5-mile for urban areas and sensitive uses, and 1,000 feet for isolated rural residences. If the specified uses are within the setback distances, the County presumes an increased potential for odor nuisance conditions, though it relies on a record of odor complaints to confirm the presence or absence of nuisance conditions.

Odor modeling was not used in the evaluation of odor impacts in this EIR because it is highly subjective. Unlike HRAs and AAQAs, there is a lack of agency guidance in conducting an adequate odor model analysis. Odors can be detected within very short timeframes (on the order of seconds), and the minimum averaging period for the most-used dispersion models is one-hour, requiring the use of lesser-known and understood models, or manually adjusting the averaging period. In addition, there is a huge variability among the general population in the ability to detect odor. Since odor is a nuisance, an odor study generally uses the most conservative odor detection threshold available. Finally, it is almost impossible to change someone's perception of odors of particular uses, such as dairies, and model results will often be ignored if an individual claims the detection of a nuisance odor.

5.3.2 ENVIRONMENTAL IMPACTS

The evaluation of the Oliveira Dairy Expansion project addresses the emissions associated with the expansion of the existing herd size from 2,218 cows to the proposed level of operations at 4,400 cows (see Table 3-3 in Chapter 3, *Project Description* of this EIR for a breakout of the herd by age-class). Approximately 249 acres of the project site are currently used for the production of crops and application of manure process water and/or solid manure. With implementation of the proposed project, crops grown on 242± acres of the project site would continue to be used for dairy feed crops and supplement imported grain and hay. The number of silage piles would increase from two to four.

The existing operation includes a dairy facility located on an approximate 22-acre portion of the 290-acre dairy farm. The developed facilities include freestall barns, open corrals, shade structures, a milk parlor, feed storage area, manure storage area, maternity barn, commodity barn, two wastewater storage ponds, one settling basin, a hay barn, and four residences occupied by the dairy owner and employees located at the dairy facility⁶.

⁶ There are two additional residences (one single-family home and one mobile home) associated with project area fields, but because operations at these fields would not change, for the purposes of this analysis, these residences are not discussed further.

The proposed project would include the construction of supporting buildings and structures, including two new shade barns, approximately 30,000 square feet each; two additional freestall barns, approximately 52,500 square feet and 72,500 square feet; and a new milking parlor, approximately 30,000 square feet. The existing commodity barn would be relocated to an area south on the site. The existing milking parlor and three residences would be removed, for a total of 6,400 square feet of building to be removed. With implementation of the proposed dairy expansion, new structures would consist of approximately 215,000 square feet of construction, for a total of 312,700 square feet of building structures. A septic system and leach field for the proposed milking parlor would be installed, and three existing septic systems associated with existing residences would be removed. With construction of the proposed facilities, approximately seven acres of cropped acreage would be converted to active dairy facilities. The remaining 242± acres would continue to be cropped with dairy feed crops. The cropping pattern for fields would change with the proposed expansion, from double-cropped to triple cropped. With implementation of the proposed project, the number of employees would increase from 7 to approximately 14 workers. All project-related construction and operational activities would generate some level of air quality emissions, and thus are being assessed as part of this EIR.

Impact AQ-1: Construction-related emissions (Criterion III.b)

Construction activities associated with the Oliveira Dairy Expansion project would result in short-term air emissions including ROG, CO, SO₂, NO_x, and fugitive dust. For projects in which construction related activities would disturb equal to or greater than one acre of surface area, the SJVAPCD requires implementation of an approved Dust Control Plan. This would be a significant impact.

Setting information is presented in Appendix F, *Air Quality Technical Appendix* regarding ozone precursors and fugitive dust, including the major sources of the pollutant; its potential for adverse environmental effects; the trend of the pollutant in the San Joaquin Valley and Merced County both in terms of number of violations and concentration in the environment; the amount of the pollutant emitted in the San Joaquin Valley and Merced County; the role of animal confinement facilities in the emissions; and potential human health effects. The San Joaquin Valley, including Merced County, is designated as a nonattainment area for federal 8-hour ozone standards, federal annual PM_{2.5} standards, state 1- and 8-hour ozone standards, and state PM₁₀ and PM_{2.5} standards.

Construction-related emissions were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 (see Appendix F). The individual components of construction emissions include employee trips, exhaust emissions from construction equipment, and fugitive dust emissions. The project would be constructed in two phases over 10 years depending on market conditions. Since the exact phases of construction are not currently known, this analysis calculates for a single phase of construction for all project components as a worst-case scenario. Project construction would occur over an approximate seven-acre area.

Table 5-5 presents an estimate of annualized construction emissions for the Oliveira Dairy Expansion project. Construction of the proposed project would produce maximum unmitigated emissions of 0.30 tons of ROG, 2.52 tons of NO_x, and 0.36 tons of PM₁₀. Construction of the proposed project would not exceed the significance criteria of 10 tons/year of ROG, 10 tons/year of NO_x, or 15 tons/year for PM₁₀.

Table 5-5 Construction Related Emissions

	ROG (tons/year)	NO_x (tons/year)	PM₁₀ (tons/year)	PM_{2.5} (tons/year)
Year 2019 Emissions ⁽¹⁾	0.23	2.17	0.36	0.22
Year 2020 Emissions	0.30	2.52	0.26	0.15
Maximum Annual Emissions	0.30	2.52	0.36	0.22
SJVAPCD Significance Criteria	10	10	15	15
Criterion Exceeded?	No	No	No	n/a

Notes: Calculations completed in December 2018.

1 See CalEEMod calculation assumptions in Appendix F. To represent the worst-case scenario, the entirety of the project was assumed to be constructed in one phase over 1.5 years.

Source: *Planning Partners, 2018.*

Although the project would not exceed significance thresholds, the applicant would still be required to comply with Regulation VIII and all applicable SJVAPCD Rules and Regulations. SJVAPCD's Regulation VIII (Rule 8021) specifies control measures for PM₁₀ emissions from construction related activities, including demolition. In addition, Rule 3135 establishes a Dust Control Plan Fee, which would also be required. A summary of control measures for construction and other earthmoving activities included in Regulation VIII are as follows:

Pre-Activity:

- Pre-water site sufficient to limit VDE to 20% opacity, and
- Phase work to reduce the amount of disturbed surface area at any one time.

During Active Operations:

- Apply water or chemical/organic stabilizers/suppressants sufficient to limit VDE to 20% opacity; or
- Construct and maintain wind barriers sufficient to limit VDE to 20% opacity.
- Apply water or chemical/organic stabilizers/suppressants to unpaved haul/access roads and unpaved vehicle/equipment traffic areas sufficient to limit VDE to 20% opacity and meet the conditions of a stabilized unpaved road surface.

Temporary Stabilization During Periods of Inactivity:

- Restrict vehicular access to the area; and
- Apply water or chemical/organic stabilizers/suppressants, sufficient to comply with the conditions of a stabilized surface. If an area having 0.5 acres or more of disturbed surface area remains unused for seven or more days, the area must comply with the conditions for a stabilized surface area as defined in section 3.53 of Rule 8011.

Speed Limitations and Posting of Speed Limit Signs on Uncontrolled Unpaved Access/Haul Roads on Construction Sites

- Limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within construction sites to a maximum of 15 miles per hour.
- Post speed limit signs that meet State and federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall also be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads.

Wind Generated Fugitive Dust Requirements

- Cease outdoor construction, excavation, extraction, and other earthmoving activities that disturb the soil whenever VDE exceeds 20% opacity. Indoor activities such as electrical, plumbing, dry wall installation, painting, and any other activity that does not cause any disturbances to the soil are not subject to this requirement.
 - Continue operation of water trucks/devices when outdoor construction excavation, extraction, and other earthmoving activities cease, unless unsafe to do so.
-

The SJVAPCD requires that animal confinement facilities obtain an ATC permit prior to initiating construction on a new facility if the facility results in emissions in excess of five tons/year of VOCs, or for expanding facilities with an existing ATC/PTO. The proposed dairy expansion project would require a new ATC and PTO from the SJVAPCD for the expanded herd and modification of the existing facilities. The project's compliance with Regulation VIII would be enforced through the ATC permit. For projects in which construction related activities would disturb equal to or greater than one acre of surface area, the SJVAPCD recommends that the County's conditions of approval require that the applicant provide a receipt of a SJVAPCD approved Dust Control Plan or Construction Notification form prior to the issuance of the first building permit.

Emissions of construction-related ozone precursors and fugitive dust would not exceed the threshold values used by the SJVAPCD. In addition, the project would be required to implement construction dust control measures and comply with SJVAPCD rules described above to reduce construction emissions. To ensure project compliance with applicable SJVAPCD Rules and Regulations, the following mitigation measure would be required.

Significance of Impact: Significant.

Mitigation Measure AQ-1:

Prior to the release of the first-issued building permit, the applicant shall provide to the County a receipt of a SJVAPCD approved Dust Control Plan or Construction Notification form in compliance with Regulation VIII – Fugitive Dust PM₁₀ Prohibitions. The dairy expansion may be subject to additional rules, including, but not limited to Rule 4570, Confined Animal Facilities, Rule 4102 (Nuisance), Rule 4601 (Architectural Coatings), Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations), and Rule 4002 (National Emission Standards for Hazardous Air Pollutants). The project applicant will be required to implement measures of applicable SJVAPCD Rules and Regulations as noted.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project area. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Project implementation of SJVAPCD rules and regulations to be included in the SJVAPCD permit process would ensure the proposed project would not exceed construction emission thresholds.

Implementation/Monitoring: Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced County Division of Environmental Health and the SJVAPCD shall monitor for compliance. Implementation of AQ-1 shall be implemented prior to the release of the first-issued building permit and throughout ongoing operations.

Impact AQ-2: Carbon monoxide emissions from operational equipment and increased traffic (Criteria III.b)

Operation of equipment used at the Oliveira Dairy Expansion for processing and farming would result in emissions of carbon monoxide. Because the magnitude of emissions from the Oliveira Dairy Expansion would not exceed SJVAPCD significance criteria, this would be a less-than-significant impact.

Setting information regarding CO, including the major sources of the pollutant; its potential for adverse environmental effects; the attainment status of the San Joaquin Valley and Merced County; the amount of the pollutant emitted in the San Joaquin Valley and Merced County; the role of animal confinement facilities in the emissions; and potential human health effects, is presented in Appendix F, *Air Quality Technical Appendix*. As set forth in Table 5-2, the San Joaquin Valley air basin, including Merced County, is in attainment for CO under both state and federal standards.

Equipment such as tractors and milk trucks are used at the Oliveira Dairy, and the use of this equipment results in exhaust emissions. On-site mobile source emissions from the diesel-fueled feed loading tractor, a manure scraping tractor, a manure loading tractor, a feed delivery tractor, a bedding delivery tractor, milk tankers, commodity delivery trucks, manure removal trucks, and rendering services trucks would result in a minimal increase of CO emissions with the proposed expansion (see Appendix B of the AAQA in Appendix G of this EIR). Additionally, the SJVAPCD has implemented Rules 4701 and 4702 regulating the operations of internal combustion engines to further reduce potential CO, ROG, and NO_x emissions.

Expanded facility operations at the Oliveira Dairy would result in increases of vehicular traffic on local roads, and, therefore, in localized exhaust emissions. The primary source of CO emissions in California is on-road motor vehicles; this source is significant only for areas with large traffic volumes and congested intersections and roadways. Milk from the proposed project would continue to be collected from the dairy by tanker truck. Feed and commodity deliveries would result in additional truck trips to the dairy site, and new employees would increase light vehicle use on the project site. As estimated by the project sponsor, average daily trips (ADT) by all vehicle classes are approximately 24 ADT, and would increase to approximately 40 ADT with the proposed expansion. With low traffic volumes and generally high levels of service of rural roadways serving the site (and resulting low background concentrations of CO), the effect of CO emissions related to traffic from dairy operations at the Oliveira Dairy Expansion is expected to be minimal.

Because of the low volumes of traffic associated with the project, and the fact that the Air Basin is in attainment for state and federal CO standards, the CO emissions associated with the traffic related to the proposed levels of operations at the project are considered to be less than significant.

Significance of Impact: Less than significant.

Mitigation Measure AQ-2: None required.

Impact AQ-3: Ozone precursor emissions from dairy operations, farm equipment, and increased traffic (Criteria III.b)

Emissions of ozone precursors (volatile organic Compounds (VOC)/Reactive Organic Gases (ROG) and Nitrogen Oxides (NO_x)) from dairy operations, farm equipment, and increased traffic from the Oliveira Dairy Expansion project would exceed SJVAPCD emissions criteria with establishment of the dairy expansion, which could result in human health effects. This would be a significant impact.

Setting information is presented in Appendix F, *Air Quality Technical Appendix* regarding ROG/VOC and NO_x, precursors of ozone, including the major sources of the pollutants; their potential for adverse environmental effects; the trend of the pollutants in the San Joaquin Valley and Merced County both in terms of number of violations and concentration in the environment; the amount of the pollutants emitted in the San Joaquin Valley and Merced County; the role of animal confinement facilities in the emissions; and potential human health effects.

New dairies that exceed the threshold of five tons/year of VOCs or modifications to existing sources that are subject to the SJVAPCD permit requirements must obtain an ATC and PTO from the SJVAPCD, as well as undergo New Source Review (Rule 2201) requirements to determine if new emission sources trigger BACT. Farming equipment exhaust, increased vehicle exhaust, and manure management and feed are sources of ozone precursor emissions. These sources are discussed by pollutant type (NO_x or VOC) below.

Farming Equipment and Increased Traffic: Operational sources of VOC and NO_x emissions associated with animal confinement facilities include farming equipment exhaust⁷, truck exhaust, and employee vehicle exhaust. Vehicular traffic from the Oliveira Dairy Expansion would generate approximately 16 additional ADTs from truck trips and employee travel. Farming equipment such as tractors, milk trucks, back-up generators⁸, and pumps are typically used as part of dairy or other animal confinement operations, and the increased use of this equipment would contribute to an increase in exhaust emissions. Farming equipment used for crop harvesting would also result in exhaust emissions, and there would be an increase in use and emissions since there would be an overall increase in cropping activity with the proposed dairy expansion (farming operations would increase from double to triple cropping).

NO_x Emissions - The existing and proposed project mobile emissions were calculated using CalEEMod Version 2016.3.2 (see Appendix F). The increment of increase with the proposed expansion of NO_x emissions from truck trips, employee travel, and on-site mobile movement and idling of dairy equipment such the feed loader and manure trucks would be 1.0 tons per year.

⁷ The ARB In-Use Off-Road Diesel Vehicle Regulation aims to reduce diesel PM and NO_x emissions from existing off-road heavy-duty diesel vehicles in California. However, vehicles used solely for agriculture are exempt from the Off-Road regulation.

⁸ The District's permitting process typically ensures that emissions of criteria pollutants from permitted equipment and activities at stationary sources are reduced or mitigated to below the District's thresholds of significance. Because there is no new permitted equipment proposed for the dairy herd expansion, there would be no change in emissions from permitted sources.

Using the ARB's 2012 emissions inventory for Merced County and the U.S. Department of Agriculture's 2012 census for harvested acres in Merced County, an emission factor specific to the county can be derived for emissions from farm equipment as 8.17 pounds/acre/year for NO_x (ARB 2013; USDA 2014)⁹. By applying this emission factor to the existing 498 acres harvested (all fields are harvested twice a year with the double cropping pattern – see Appendix F-3 pg. 11) and to the proposed 726 acres harvested (fields would be harvested three times a year based on the proposed cropping pattern – see Appendix F-3 pg. 12) for the Oliveira Dairy operation, estimated increased emissions from farm equipment would be 0.93 tons/year. Therefore, the increment of increase of NO_x emissions from vehicle trips, farm equipment, and on-site dairy equipment as a result of the proposed expansion would be 1.93 tons/year.

VOC Emissions - Increased traffic emissions and area sources were calculated using CalEEMod Version 2016.3.2 (see Appendix F). The estimated increase of VOC/ROG emissions from traffic and area sources at the dairy and on-site residences are 0.92 tons/year for proposed operations.

Using the ARB's 2012 emissions inventory for Merced County and the U.S. Department of Agriculture's 2012 census for harvested acres in Merced County, an emission factor specific to the county can be derived for emissions from farm equipment as 1.49 pounds/acre/year for VOC (ARB 2013; USDA 2014)¹⁰. By applying this emission factor to the existing 498 acres harvested (all fields are harvested twice a year with the double cropping pattern – see Appendix F-3 pg. 11) and to the proposed 726 acres harvested (fields would be harvested three times a year based on the proposed cropping pattern – see Appendix F-3 pg. 12), estimated increased emissions from farm equipment would be 0.17 tons/year of VOC. Therefore, the increment of increase of VOC emissions from vehicle trips and farm equipment as a result of the proposed expansion would be 1.09 tons/year.

Manure Management and Feed:

NO_x Emissions - Most nitrogen loss from manure management occurs in the form of N₂O emissions from nitrification and denitrification of the nitrogen contained in the manure. Indirect emissions result from volatile nitrogen losses, primarily in the form of ammonia and NO_x. There are large uncertainties associated with the default emission factors of direct N₂O emissions from manure management, and similarly with NO_x emissions, since NO_x emissions from manure decomposition are highly dependent on the management system and duration of waste management (Eckard 2007).

VOC Emissions - Reactive organic gases, or VOCs, are an ozone precursor and are emitted directly from dairy cows, from the fermentation and decomposition of cattle feed, and from the decomposition of cattle manure. There are several management practices used at the Oliveira Dairy that control emissions. For example, all animals are fed in accordance with National Research Council (NRC) guidelines to minimize undigested protein and other undigested nutrients in the manure with the result that the overall emissions NH₃ and VOCs emission with manure decomposition are reduced. The SJVAPCD proposed emission reduction measures for feed handling and storage include best management practices, such as minimizing the surface area of the

⁹ In Merced County, an estimated 5.37 tons/day of NO_x was emitted from farming equipment in 2012, with approximately 480,103 acres harvested in the county.

¹⁰ In Merced County, an estimated 0.98 tons/day of VOC was emitted from farming equipment in 2012, with approximately 480,103 acres harvested in the county.

silage face exposed to the atmosphere and cleaning up residual feed to avoid decomposition and increased emissions.

Calculations of total VOC emissions from cows at the Oliveira Dairy Expansion are set forth in Appendix F. Silage pile and Total Mixed Ration (TMR) VOC emissions flux are calculated based on the area of exposure on the silage piles and feed lanes¹¹. Estimated VOC emissions from feed at the Oliveira Dairy Expansion project are set forth in Appendix F. The dairy would continue to maintain the same number of covered silage piles with an open end. TMR was calculated based estimated area of feed per cow. VOC emissions from the feed and manure management would total 45.45 tons/year with the proposed project, with the expansion contributing 21.35 more tons/year over existing conditions. VOC emissions from all animal confinement facilities in the San Joaquin Valley are discussed in Section 12.1, *Cumulative Impacts*.

The VOC Emission Factors used in this analysis are from the dairy emissions calculator spreadsheet provided by the SJVAPCD (dated September 2015)¹². Aggregated VOC emissions for all activities associated with the Oliveira Dairy Expansion are presented in Table 5-6.

Emission Source	Existing (Baseline) VOC/ROG Emissions	Proposed VOC/ROG Emissions	Increment of Increase with Proposed Expansion
Equipment and Increased Traffic	0.90 tons/year	1.99 tons/year	1.09 tons/year
Feed and Manure Management	24.10 tons/year	45.45 tons/year	21.35 tons/year
Total	25.00 tons/year	47.44 tons/year	22.44 tons/year
SJVAPCD Significance Criterion			10 tons/year
Criterion Exceeded?			YES

Source: Planning Partners, 2018.

Summarily, NO_x emissions from expanded project operations for mobile source and farm equipment would result in a net increase of 1.93 tons/year of NO_x emissions over existing conditions. The increment of increase in VOC emissions associated with the proposed expansion would be 22.44 tons/year over existing operations. The proposed dairy expansion would trigger New Source Review and application of BACT, and an ATC/PTO would be required prior to the initiation of construction. As part of the PTO, the dairy operator would be required to submit an ATC/PTO application detailing an emission mitigation plan listing all chosen BACT/BARCT mitigation measures. The SJVAPCD would then consider implementation of the selected mitigation measures as conditions of the ATC permit required by District Rule 2201. The menu of potential mitigation measures that could apply to the proposed dairy expansion is included in Appendix D of this EIR. Chapter 18.48.050 U of the ACO (see Appendix C) applies to this impact, which includes

¹¹ For the purposes of this analysis, it is assumed that there would only be one open silage face for each silage type at a given time.

¹² The Oliveira Dairy is currently required to comply with all applicable mitigation measure requirements of SJVAPCD Rule 4570, which are expected to result in VOC emissions reductions. These mitigation measures as identified by the SJVAPCD, and the expected control measure for each, are included in calculations for existing and proposed operations.

compliance with requirements of the SJVAPCD and required reduction of air emissions, including PM₁₀ and ROG.

In order to mitigate significant air quality impacts from a project, the SJVAPCD may enter into a Voluntary Emission Reduction Agreement (VERA) with a project applicant. A VERA is a program in which a project applicant provides a pound-for-pound mitigation of project-specific emissions by providing funds for SJVAPCD emission reduction projects. In implementing a VERA, the SJVAPCD verifies the actual emission reductions that have been achieved as a result of completed grant contracts, monitors the emission reduction projects, and ensures the enforceability of achieved reductions. Merced County supports the SJVAPCD in its use of a VERA as reduction measure to lessen impacts on air quality. The 2030 Merced County General Plan includes Policy AQ-6.8: Voluntary Emissions Reduction Agreement, in the General Plan, which encourages project applicants to consult with the SJVAPCD regarding the establishment of a VERA. Consistent with General Plan Policy AQ-6.8, Mitigation Measure AQ-3b below would be required.

Because the proposed dairy expansion project would result in an increase of VOC emissions that would exceed the SJVAPCD significance thresholds and could result in human health effects, the project-level impact would be significant. Because the Air Basin is in nonattainment for both federal and state ozone standards, and VOCs and NO_x are ozone precursors, these emissions would be considered cumulatively significant (see Section 13.1, *Cumulative Impacts*).

Significance of Impact: Significant.

Mitigation Measure AQ-3a:

The proposed dairy expansion would exceed SJVAPCD permit thresholds for ROG emissions; therefore, in order to reduce emissions, prior to the initiation of operations, the applicant shall implement all air quality provisions of the ACO, including Chapter 18.48.50 U; comply with all applicable SJVAPCD Rules including but not limited to: Rule 2010 – apply for an Authority to Construct/Permit to Operate; Rule 2201 New Source Review; Rule 4570, Confined Animal Facilities; implement BACT/BARCT mitigation measures appropriate for this dairy operation to be developed during permit review in cooperation with SJVAPCD staff, including but not limited to all applicable measures in Appendix D of this EIR; and Rules 4701 and 4702, Internal Combustion Engines.

Mitigation Measure AQ-3b:

Because project emissions have been evaluated to exceed SJVAPCD significance thresholds, the project applicant shall consult with the SJVAPCD regarding the establishment of a Voluntary Emissions Reduction Agreement between the applicant and the SJVAPCD. Consultation shall occur prior to issuance of building permits, and documentation of consultation with the SJVAPCD shall be provided to the County.

Potential Environmental Effects of Measures: On-site facilities necessary to comply with the ACO and SJVAPCD requirements would be constructed within the overall facility footprint of the Oliveira Dairy Expansion as assessed in Chapters 5-11 of this EIR. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Even after imposition of the identified mitigation measure, this would be a significant and unavoidable impact for the following reasons: the BACT/BARCT

measures required by the above Mitigation Measure AQ-3a may not be sufficient to reduce project ROG emissions below the threshold of significance; the Voluntary Emissions Reduction Agreement encouraged in Mitigation Measure AQ-3b may not be required by the SJVAPCD, and therefore may not reduce project ROG emissions below the threshold of significance; and the San Joaquin Valley Air Basin is in nonattainment for both federal and state ozone standards. The ultimate success of implementing Mitigation Measure AQ-3b is contingent on a favorable negotiation between a project applicant and the SJVAPCD; however, Merced County is unable to control the outcome of the negotiation, and hence the effectiveness, of the measure. Further, since Merced County would not be a party to negotiations between the project applicant and the SJVAPCD, the County could not be assured that a VERA could successfully be accomplished within a reasonable period of time, and it would be considered infeasible for the County to require establishment of a VERA.

Implementation and Monitoring: Implementation of these measures would be the responsibility of the project applicant. The Merced County Community and Economic Development Department and San Joaquin Valley Air Pollution Control District shall monitor for compliance. Mitigation Measure AQ-3a shall be implemented prior to final inspection or prior to initiation of new operations and throughout ongoing operations. Mitigation Measure AQ-3b shall be implemented prior to issuance of a building permit and throughout ongoing operations.

Impact AQ-4: PM₁₀ and PM_{2.5} emissions from fugitive dust during project operations (Criteria III.b)

Operations at the Oliveira Dairy Expansion would result in fugitive dust (PM₁₀ and PM_{2.5}) emissions from wind erosion, farming operations, animal movement in unpaved corrals, vehicle use along unpaved driveways and access roads, and equipment operation. Because pollutant concentrations would not exceed SJVAPCD emissions thresholds, this would be a less-than-significant impact.

Setting information regarding particulate matter, including the major sources of the pollutant; its potential for adverse environmental effects; the trend of the pollutant in the San Joaquin Valley and Merced County both in terms of number of violations and concentration in the environment; the amount of the pollutant emitted in the San Joaquin Valley and Merced County; the role of animal confinement facilities in the emissions; and potential human health effects, is presented in Appendix F-1, *Air Quality Technical Appendix*. For an evaluation of the project potential to impact ambient air quality through a violation of any air quality standard or a substantial contribution to an existing or projected air quality standard, see Impact AQ-8.

As discussed in detail in the following paragraphs, several sources of particulate matter emissions are associated with animal confinement facilities: wind erosion, farming operations, farming equipment exhaust, traffic on unpaved roadways, and animal movement. Calculation spreadsheets are included in Appendix F-2. Various management practices are used at this dairy to control PM emissions. The dairy uses a flush system with recycled water to clean the milk barn, which minimizes PM emissions. Concrete lanes in the freestall barns reduce PM emissions since the cows are on a paved surface instead of loose dirt, and flushing of the freestalls to remove manure also minimizes PM emission.

Wind Erosion: Wind erosion from land cultivation produces PM₁₀ and PM_{2.5} emissions. Research from the ARB has led to emission factor estimates that would be appropriate for application to this project. The Oliveira Dairy already has approximately 249 acres in farming operations that are currently being exposed to cultivation and occasional wind erosion under existing conditions. Based on existing and proposed cropping patterns, emission factors would be applied to 498 acres cultivated under existing conditions (due to double cropping), and 726 acres cultivated under proposed conditions (due to triple cropping) (see Appendix F-3 pgs. 11 and 12). Based on emission factors from the ARB of 13.7 lbs/acre/year for PM₁₀ and 2.37 for PM_{2.5}, the existing project operations would generate 3.40 tons/year of PM₁₀ and 0.59 tons/year of PM_{2.5} from wind erosion, and proposed project operations would generate 4.96 tons/year of PM₁₀ and 0.86 tons/year of PM_{2.5} from wind erosion (see Appendix F for calculations and assumptions).

Farming Operations: Land preparation and harvesting produces PM₁₀ emissions. Research from the ARB has led to emission factor estimates that would be appropriate for application to this project. There are different emission factors for land preparation and for harvesting according to crop type as shown in Appendix F. By applying these crop-specific emission factors to the existing 249 acres double-cropped in oats silage and corn silage (see Appendix F-3 pg. 11) for the Oliveira Dairy operation, estimated emissions from land preparation and harvesting for existing operations are 2.06 tons/year of PM₁₀ and 0.31 tons/year of PM_{2.5}. Proposed operations would include 242 acres triple-cropped in oats silage, corn silage, and sudangrass silage (see Appendix F-3 pg. 12), and estimated emissions from land preparation and harvesting for proposed operations would be 2.49 tons/year of PM₁₀ and 0.37 tons/year of PM_{2.5}.

Farming Equipment and Increased Traffic: On-site mobile sources of exhaust emissions include a feed loading tractor, a manure scraping tractor, a manure loading tractor, a feed delivery tractor, a bedding delivery tractor, milk tankers, commodity delivery trucks, manure removal trucks, and rendering services trucks. Emissions could also occur from vehicle travel on paved and unpaved roads. Based on mobile source calculations in CalEEMod and from the AAQA, the proposed dairy expansion traffic operations would result in an increment of increase of 0.09 tons/year of PM₁₀.

Animal Movement: Emissions attributed to animal movement were estimated using PM₁₀ emission factors currently used by the SJVAPCD (see Appendix F of this EIR). Based on these emissions factors, the proposed Oliveira Dairy Expansion would result in an incremental decrease of -0.13 tons/year of PM₁₀. There would be a decrease in PM₁₀ emissions based on the changes in animal housing.

Additionally, spreading dry manure on cropped fields creates PM₁₀ emissions. Dry manure is currently applied on 301 acres (while all fields are double cropped, not all occurrences receive dry manure - see Appendix F-3 pg. 13), which results in approximately 0.76 tons/year of PM₁₀. With the proposed expansion, dry manure would be applied to 249 acres under proposed conditions (see Appendix F-3 pg. 13), and there would be a decrease to 0.63 tons/year in PM₁₀ emissions from application of dry manure. Impacts from the application of dry manure from the proposed dairy herd expansion at off-site locations are discussed in Section 13.1, *Cumulative Impacts*.

Aggregated PM₁₀ emissions for all activities associated with the Oliveira Dairy Expansion are presented in Table 5-7.

Table 5-7 Aggregated PM₁₀ and PM_{2.5} Emissions for Project-Specific Activities for the Proposed Dairy Expansion

Emission Source	Project Increase of PM ₁₀ Emissions (tons/year)	Project Increase of PM _{2.5} Emissions (tons/year)
Wind Erosion	1.56	0.27
Farming Operations	0.43	0.06
Traffic, On-site Mobile Source, Area Sources	0.09	0.03
Animal Movement	-0.13	--
Dry Manure Application	-0.13	--
Total	1.82	0.36
SJVAPCD Significance Criterion	15 tons/year	15 tons/year
Criterion Exceeded?	NO	NO

Source: Planning Partners, 2018.

As shown above, particulate matter emissions would not exceed SJVAPCD significance criteria for PM₁₀ or PM_{2.5}.

SJVAPCD Rule 4550 includes dairies, other animal confinement facilities, and other on-field farming operations. As mentioned above, Rule 4550 requires the preparation of CMP plans to reduce PM₁₀ emissions. This rule applies to agricultural operators with more than 100 contiguous acres, including the Oliveira Dairy. Unpaved roads with traffic volumes greater than 75 vehicles per day (but not internal farm roads or roads with average daily traffic volumes fewer than 75 vehicles) are subject to SJVAPCD regulation.

Chapters 18.48.050 U and HH of the ACO (see Appendix C) apply to this impact, which includes compliance with requirements of the SJVAPCD, dust control measures for unpaved roadways, and required reduction of air emissions, including PM₁₀ and ROG. The dairy BACT/BARCT mitigation requirements presented in Appendix D would apply to the proposed project for required measures, and could be made conditions of the SJVAPCD's permit approval of the dairy for feasible measures.

While the Merced County portion of the San Joaquin Valley Air Basin has been classified as non-attainment for PM₁₀ under the established CAAQS, the expanded operations of the proposed dairy are not predicted to exceed SJVAPCD significance thresholds, and this would be considered a less-than-significant impact.

Significance of Impact: Less than significant.

Mitigation Measure AQ-4: None required.

Impact AQ-5: Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations (Criterion III.c)

The proposed dairy expansion would be a potential source of hazardous air pollutants from construction activities, animal movement, manure management, and on-site mobile sources. Without the application of SJVAPCD-approved control measures, this project would exceed health risk thresholds. This would be a significant impact.

Proposed modifications to the dairy would result in emissions of hazardous air pollutants and would be located near existing residences; therefore, an assessment of the potential risk to the population attributable to emissions of hazardous air pollutants from the proposed dairy modification is required. The Health Risk Assessment (HRA) prepared for the Oliveira Dairy Expansion project assesses the potential risk to the adjacent residents and workers attributable to emissions of hazardous air pollutants from construction and operation of the proposed dairy (see Appendix H¹³).

The HRA addresses emissions from: ammonia; hydrogen sulfide; particulate matter and its toxic components (e.g., aluminum, lead, manganese, nickel, etc.); and xylenes, formaldehydes, carbon tetrachloride, and other components from VOCs (see Appendix H, *Health Risk Assessment*, for the list of toxic substances emitted from project activities and classification of these substances as to their potential for producing carcinogenic and non-cancer acute or chronic health impacts). The toxic air pollutants of greatest concern are those that cause serious health problems or affect many people. Health problems can include cancer, respiratory irritation, nervous system problems, and birth defects. Toxic Air Contaminants (TAC) emissions of concern from construction activities would include the diesel particulate matter (DPM) emissions from on-site construction equipment exhaust.

Setting information regarding ammonia, hydrogen sulfide, PM₁₀ and PM_{2.5}, including the major sources of the pollutants; their potential for adverse environmental effects; the trend of the pollutants in the San Joaquin Valley and Merced County both in terms of number of violations and concentration in the environment; the amount of the pollutants emitted in the San Joaquin Valley and Merced County; the role of animal confinement facilities in the emissions; and potential human health effects, is presented in Appendix F, *Air Quality Technical Appendix*.

The most recent version of the EPA's AMS/EPA Regulatory Model - AERMOD (recompiled for the Lakes ISC-AERMOD View interface) was used to predict the dispersion of emissions from the proposed dairy expansion (see Appendix H, *Health Risk Assessment*, for the list of toxic substances emitted from project activities and classification of these substances as to their potential for producing carcinogenic and non-cancer acute or chronic health impacts).¹⁴ SJVAPCD-approved control measures that were determined feasible by the project applicant were applied to PM₁₀ emission factors for providing shaded areas, sprinklers, feed young stock at dusk, and planting upwind and downwind shelter breaks. Appendix H includes complete details on pre-project and post-project cattle and housing locations.

¹³ Calculations for this Appendix were completed in December 2018.

¹⁴ The SJVAPCD's *Dairy H₂S AERMOD Hourly Emission File Generator* states that H₂S emission are only generated at dairies in lagoons used to store or treat collected waste material. The generator calculates emissions based on the surface area of the lagoon. As there would be no increase in the surface area of the existing lagoons, there would be no increase in H₂S emission associated with the proposed expansion.

A total of 65 off-site receptors¹⁵ of residences and 71 potential agricultural workers were assessed during the preparation of the HRA. With the proposed dairy expansion, there would be only one on-site residence; however, this residence is occupied by the dairy owner. In accordance with SJVAPCD policy, the owner's residence was excluded (see Table 2-3 of Appendix H, *Health Risk Assessment*, for coordinates of residences included as maximum impact receptors in the model).

Cancer risks are primarily attributable to breathing into the lungs emissions of diesel particulate matter. Acute non-cancer hazard risks are primarily attributable to emissions of ammonia, which affects the respiratory system and eyes. Chronic non-cancer hazard risks are primarily attributable to emissions of ammonia and affect the respiratory system, central nervous system, cardiovascular system, development, and skin.

Due to the proposed project having multi-year construction related emissions, the proposed project was evaluated for potential health impacts to surrounding receptors (on-site and off-site) resulting from multi-year construction TAC emissions (see Appendix H for construction assumptions and modeling parameters).

Emissions of hazardous air pollutants attributable to proposed increases in construction activities, animal movement, manure management and on-site mobile sources are calculated using generally accepted emission factors. Ambient air concentrations are predicted with dispersion modeling to arrive at a conservative estimate of increased individual carcinogenic risk that might occur as a result of continuous exposure over a 70-year lifetime. Similarly, concentrations of compounds with non-cancer adverse health effects are used to calculate hazard indices, which are the ratio of expected exposure to acceptable exposure.

Pursuant to guidance by the SJVAPCD, emissions based on the current configuration of the dairy are considered to be existing emissions. Based on this guidance, the facility's existing emissions are not considered as part of the evaluation of the proposed dairy expansion. Emissions from the dairy expansion have been restricted to incremental emissions from construction activities, animal movement, manure management, and land application of wastewater based on the proposed increase in the number of cattle and the additional on-site mobile sources required for the expansion.

On-site mobile sources for this facility include a diesel-fueled feed loading tractor, a manure scraping tractor, a manure loading tractor, a feed delivery tractor, a bedding delivery tractor, milk tankers, commodity delivery trucks, manure removal trucks, and rendering services trucks. The increased herd size will require additional tractor use for feed loading and delivery, bedding delivery, and solid manure scraping and loading. Additional truck trips will be required for milk tankers, commodity delivery trucks, solid manure removal trucks, and rendering services trucks. There will also be emission increases from the new freestalls and corrals, milk barn, lagoons and land application areas associated with increased herd size.

¹⁵ For the purpose of this document, **receptors** are defined as people – children, adults, and seniors – occupying or residing in: Residential dwellings; Schools; Daycares; Hospitals; and Senior-care facilities. **Sensitive receptors** are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and designated residential areas are examples of sensitive receptors.

With implementation of SJVAPCD-approved control measures, the carcinogenic risk predicted at the potentially impacted receptors would not exceed the significance level of twenty in one million (20×10^{-6}). The health hazard index (HI) for chronic non-cancer risk would be below the significance level of 1.0 at all modeled residences. (The excess cancer risk, acute non-cancer HIs, and chronic non-cancer HIs for the each modeled receptor are provided in Table 3-3 of Appendix H.) Compliance with SJVAPCD Rules 4565 and 4570 during the permitting process would further reduce ammonia concentrations. To ensure the implementation of SJVAPCD-approved control measures, the following mitigation would be required.

Significance of Impact: Significant.

Mitigation Measure AQ-5:

The project applicant shall apply SJVAPCD-approved control measures to reduce PM_{10} emissions below SJVAPCD health risk thresholds. As applied in the HRA prepared for the project, these control measures would include providing shaded areas, sprinklers, feed young stock at dusk, and planting upwind and downwind shelter breaks. If necessary, control measures for PM_{10} emissions may be modified by the SJVAPCD during their permitting process. All control measure requirements shall be included in the SJVAPCD permit documents.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project area. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Project implementation of SJVAPCD control measure requirements to reduce PM_{10} emissions below SJVAPCD health risk thresholds to be included in the SJVAPCD permit process would ensure the proposed project would not violate any health risk thresholds.

Implementation/Monitoring: Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced County Division of Environmental Health and the SJVAPCD shall monitor for compliance. Implementation of AQ-5 shall be implemented prior to final inspection or prior to initiation of new operations and throughout ongoing operations.

Impact AQ-6: Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants (Criterion III.c)

Operations at the Oliveira Dairy Farm Expansion would result in emissions of criteria air pollutants that could impact ambient air quality through a violation of air quality standards. Without the application of SJVAPCD-approved control measures, this project would exceed ambient air quality standards for areas adjacent to the dairy. This would be a significant impact.

An AAQA was prepared to determine if the proposed dairy expansion has the potential to impact ambient air quality through a violation of the ambient air quality standards or a substantial contribution to existing or projected air quality standards using air dispersion modeling (see Appendix G¹⁶). In order to determine whether a project will cause or contribute significantly to an

¹⁶ Calculations for this Appendix were completed in August 2017.

AAQS violation, the maximum impacts attributable to the project are added to the existing background concentrations, and are then compared to the applicable ambient air quality standard. If an ambient air quality standard is not exceeded, the project is judged to not cause or contribute significantly to an AAQS violation for the applicable pollutant. If an ambient air quality standard is exceeded, it must be determined whether the project will cause a Prevention of Significant Deterioration increment violation, which is achieved by comparing the maximum predicted concentration from the project to the established significant impact level for the applicable pollutant.

Air pollution sources associated with stationary sources are regulated through the permitting authority of the SJVAPCD under the New and Modified Stationary Source Review Rule (Rule 2201). Owners of any new or modified equipment that emits, reduces, or controls air contaminants, except those specifically exempted by the SJVAPCD, are required to apply for an Authority to Construct and Permit to Operate (Rule 2010). Additionally, best available control technology is required on specific types of equipment.

Stationary sources subject to SJVAPCD New and Modified Stationary Source Review Rule must comply with Rule 2201, Section 4.14, Ambient Air Quality Standards, which requires that “emissions from a new or modified Stationary Source shall not cause or make worse the violation of an Ambient Air Quality Standard...the Air Pollution Control Officer (APCO) shall take into account the increases in minor and secondary sources emissions as well as the mitigation of emissions through offsets....” The APCO also has discretion to exempt new or modified sources that are exempt from public notification requirements¹⁷ from this section of Rule 2201.

The most recent version of EPA’s AMS/EPA Regulatory Model - AERMOD (recompiled for the Lakes ISC-AERMOD View interface) was used to predict the dispersion of emissions from the proposed dairy expansion. The analysis was limited to potential impacts from project-related emissions of nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter between 2.5 and 10 micrometers in diameter (PM₁₀), particulate matter less than 2.5 micrometers in diameter (PM_{2.5}), and hydrogen sulfide (H₂S). Project-related emissions were based on the proposed increase in the number of cattle and the additional on-site mobile sources required for the expansion. SJVAPCD-approved control measures that were determined feasible by the project applicant were applied to PM₁₀ emission factors for providing shaded areas, sprinklers, feed young stock at dusk, and planting upwind and downwind shelter breaks.

On-site mobile sources for this facility include a diesel-fueled feed loading tractor, a manure scraping tractor, a manure loading tractor, a feed delivery tractor, a bedding delivery tractor, milk tankers, commodity delivery trucks, manure removal trucks, and rendering services trucks. The increased herd size would require additional tractor use for feed loading and delivery, bedding delivery, and solid manure scraping and loading. Additional truck trips would be required for milk tankers, commodity delivery trucks, and solid manure removal trucks. There would also be emission increases from the new freestalls and corrals, milk barn, lagoons and land application areas associated with increased herd size (see Appendix G for a detailed description of operations and calculation assumptions). The predicted ambient air quality impact from criteria pollutants is included in Table 5-8.

¹⁷ *Public Notification and Publication Requirements*, San Joaquin Valley Air Pollution Control District Rule 2201 Section 5.4.

Table 5-8 Predicted Ambient Air Quality Impacts

Pollutant	Averaging Period	Background ($\mu\text{g}/\text{m}^3$)	Project ($\mu\text{g}/\text{m}^3$)	Project + Background ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	CAAQS ($\mu\text{g}/\text{m}^3$)
NO ₂	1-hour	93.1	0.00	93.10	188.68	339
	Annual	14	0.74	14.74	100	---
SO ₂	1-hour	22.6	0.00	22.6	195	655
	3-hour	20.3	0.11	20.4	1300	---
	24-hour	5.6	0.03	5.63	---	105
CO	1-hour	2340	0.00	2,340	40,000	23,000
	8-hour	1850	26.09	1,876	10,000	10,000
PM ₁₀	24-hour	64.00	6.06	70.06	150	50
	Annual	29.50	0.87	30.37	50	20
PM _{2.5}	24-hour	42.80	0.93	43.73	35	---
	Annual	11.20	0.15	11.35	12	12
H ₂ S	1-hour	N/A	0.00	0.00	---	42

- 1** Bold items show that background 24-hour and annual concentrations of PM₁₀ and the 24-hour concentration of PM_{2.5} exceed their respective ambient air quality standards.
- 2** PM_{2.5} concentrations were determined by adjusting the animal movement values for PM₁₀ in the AAQA-PSD report by the CEIDARS specified fraction for livestock dust.

Source: *Insight Environmental Consultants, Inc., AAQA December 2018. Appendix G of this EIR.*

Proposed emissions from the proposed facility would not cause or contribute significantly to a violation of the national and state ambient air quality standards for any of the averaging periods for NO₂, SO₂, CO, or H₂S. Background 24-hour and annual concentrations of PM₁₀ and 24-hour concentrations of PM_{2.5} exceed their respective ambient air quality standards. Approximately 99 percent of the project's predicted PM₁₀ concentration is attributable to fugitive PM₁₀ emissions from animal movement. Therefore, these averaging periods for PM_{2.5} and PM₁₀ are evaluated in accordance with the Prevention of Significant Deterioration (PSD) procedure in Title 40, Code of Federal Regulations (CFR), Part 52.21. As shown in Table 5-9, a comparison of the proposed impact from the project to the SJVAPCD significant impact level values for the increase in emissions demonstrates that the modeled PM₁₀ and PM_{2.5} impacts directly attributable to the project are below the applicable SJVAPCD significance levels for both the 24-hour and annual averaging periods of PM₁₀ and the 24-hour averaging period of PM_{2.5} and therefore will not cause an increment violation of any SJVAPCD SIL¹⁸.

¹⁸ For additional information regarding the SIL values used in this EIR, please refer to page 5-16 of this Chapter and Appendix G of this EIR.

Table 5-9 Comparison of Maximum Modeled Project Impact with Significance Thresholds

Pollutant	Averaging Period	Predicted Concentration ($\mu\text{g}/\text{m}^3$)	SJVAPCD SIL ($\mu\text{g}/\text{m}^3$)
PM ₁₀	24-hour	6.06	10.4
	Annual	0.87	2.08
PM _{2.5}	24-hour	0.93	2.5

Source: Insight Environmental Consultants, Inc., AAQA December 2018.

Based on the results of the air dispersion modeling and comparisons to AAQs and applicable SILs, this impact is not considered to be significant with implementation of SJVAPCD-approved control measures. Rule 2201, Section 4.14 requirements would not be applicable because the proposed project emissions are not predicted to violate any ambient air quality standards. However, without implementation of SJVAPCD-approved control measures, the project is likely to cause an increment of violation for PM emissions. To ensure the implementation of SJVAPCD-approved control measures, the following mitigation would be required.

Significance of Impact: Significant.

Mitigation Measure AQ-6a:

Implement Mitigation Measure AQ-5.

Mitigation Measure AQ-6b:

In the event the project site plan is modified, the project applicant shall be required to complete a revised ambient air quality analysis that shows the modified project would not violate any ambient air quality standards.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project area. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Project implementation of SJVAPCD control measure requirements to minimize PM₁₀ emissions to be included in the SJVAPCD permit process would ensure the proposed project would not violate any ambient air quality standards.

Implementation/Monitoring: Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced County Division of Environmental Health and the SJVAPCD shall monitor for compliance. Implementation of AQ-6a shall be implemented throughout ongoing operations. Implementation of AQ-6b shall be implemented prior to a building permit.

Impact AQ-7: Adverse odor from project operations (Criterion III.d)

Operations and manure management at the Oliveira Dairy Expansion in Merced County may emit odors that may be bothersome to nearby sensitive uses, including residences and wildlife areas. While there have been no nuisance odor complaints for the existing dairy, because the nearest off-site residences are located less than 1,000 feet from proposed active dairy facilities, there is an increased potential for nuisance conditions, and this would be a potentially significant impact.

Adverse levels of odor could potentially affect several classes of land uses. These include:

- Urban areas;
- Land uses where the residents/occupants have no choice about the location of the use and cannot move to another location (schools, hospitals, jails, etc.);
- Areas where past actions of the County have provided reasonable expectations of urban levels of land use compatibility (residentially zoned or designated districts in otherwise rural areas, and/or groups of residences in rural areas developed at urban densities);
- Isolated rural residences constructed in Agricultural zones;
- Parks, other public and private designated or permitted recreation facilities; and,
- Wildlife refuges.

As discussed in Chapter 3, *Project Description*, there are several off-site rural residences located within the windshed of the dairy (defined as an area of 1,320 feet upwind to 2,640 downwind of the periphery of the animal facility) (see Figure 3-6 in Chapter 3, *Project Description*). The City of Merced (city limits) is located approximately two miles east of the active dairy facilities. There are no protected habitat areas, such as wildlife refuges or wildlife management areas, within one mile of the project site.

Odors associated with dairy and other animal confinement operations are primarily generated from manure and silage. The odor characteristics that contribute to nuisance conditions include the intensity, concentration, or strength of the odor, the odor frequency, the duration that the odor remains detectable, and the perceived offensiveness and character or quality of the odor. The four basic approaches to control odor and odorants are diet manipulation, manure treatment, capture and treatment of emitted gases, and enhanced dispersion.

Unlike the other air pollutants evaluated in this section, odor does not have generally accepted methods of measurement or allowable concentration, and its offensiveness differs among individuals. For these reasons, Merced County has sought to prevent nuisances by the use of setbacks between potential sources of offensive odors and adjoining sensitive land uses, rather than regulating the concentration of odor-producing compounds. Under existing regulations, Merced County enforces a setback of 0.5-mile from animal confinement facilities to specified urban uses, parks, and wildlife refuges, and a minimum of 1,000 feet between animal confinement facilities (ponds, corrals, barns) and rural residences.

The County has maintained and reinforced land use policies to protect agricultural production in designated agricultural areas. Since the late 1960s, the County Zoning Code has regulated land uses in the County to maintain areas zoned for Agricultural uses in agricultural production. The County's 1978 General Plan introduced the Specific Urban Development Plan designation (now called Urban Community) whereby the County directed urban growth to occur in urban areas, with rural areas reserved for agricultural production. The 1984 Agricultural Element of the General Plan further

refined the County's Urban Centered Concept for managing urban and rural uses. This land use concept, which has been the land use policy in Merced County since the 1978 General Plan, directs anticipated urban growth to cities, unincorporated communities, or established population centers. In the 2030 General Plan, such centers are designated as City Planning Area, Rural Residential Center, Rural Center, Urban Community, Highway Interchange Center, and Isolated Urban Areas. A primary purpose of the Urban Centered Concept is to reduce conversion of productive agricultural land, including animal confinement facilities, to urban uses.

As discussed in Chapter 11, *Land Use Compatibility*, there are four off-site residences within 1,000 feet (see Figure 3-10). According to Merced County Code Chapter 18.48.040 (B)(2), the modification or expansion of an existing facility must not decrease the existing separation distance from off-site residences to less than 1,000 feet unless the off-site property owner provides written permission. Construction of the proposed facilities would not reduce the existing separation distances to off-site residences within 1,000 feet. Further, construction of the proposed facilities would not reduce the distance to residences currently greater than 1,000 feet from active dairy facilities to a separation distance less than 1,000 feet, which would meet the requirements of the ACO.

The ACO (Merced County Code Chapter 18.48.040 (B)(1)(a)) prohibits new dairies within one-half mile of urban areas or sensitive uses such as federally or state owned wildlife refuges. For an existing facility, modification or expansion of the dairy facility must not decrease the existing separation distance if it is less than one-half mile (Merced County Code Chapter 18.48.040 (B)(2)). The City of Merced is located approximately two miles east of the Oliveira Dairy active dairy facilities - well outside the one-half mile setback requirement. The Grasslands Ecological Area boundary is located approximately two miles southwest of the project site. For the Oliveira Dairy, these uses are greater than one-half mile from active dairy facilities, and the proposed dairy expansion would not decrease these distances to less than one-half mile. Further, no odor complaints have been reported at the Oliveira Dairy and submitted to the Division of Environmental Health (DEH) (Merced County, October 2018).

Chapters 18.48.050 H, 18.48.055 C.8.a, and 18.48.040 B.1 of the ACO (see Appendix C) address potential odor impacts, and require preparation of an odor management plan. Additionally, the nuisance requirements and protocols set forth in the Merced County Code regarding odor nuisances would apply. Summarily, if an odor nuisance condition were reported, as required by the ACO, DEH would implement the following procedures:

- A. If nuisance conditions are reported to the DEH, the Division shall take the following actions:

Within 72 hours of receiving a complaint, the DEH shall determine whether an odor exists during an inspection of the location of the complaint, and identify potential sources of odor in the vicinity. If a confined animal facility is identified as a potential source of the odor nuisance, the County will evaluate the affected facility and identify sources of the odor. In the event of odor causing a nuisance, the County will impose additional control measures on a site-specific basis. Measures that may be required by DEH include the operational measures set forth above.

- B. If odor nuisance conditions are confirmed, and are attributable to operations at a confined animal facility, the DEH shall require the owner/operator to remedy the nuisance condition within a specified period of time. The Division shall notify the parties reporting the nuisance of its findings, and shall provide follow-up inspections to ensure

that the nuisance condition is cured. Should the condition persist, the Division shall initiate an enforcement action against the offending operator.

Because there are several residences within the ACO setback area of 1,000 feet from active dairy facilities, expansion of the proposed facilities and an increase in herd size would increase the potential for nuisance conditions, and the following mitigation would be required.

Significance of Impact: Significant.

Mitigation Measure AQ-7a:

To minimize potential for odor nuisance conditions, prior to initiating operations at the new facilities, the applicant shall prepare an Odor Control Plan for submission and approval by the Merced DEH. Following approval, the applicant shall implement the approved Plan. The following odor control measures shall be required in the Plan:

- Liquid manure utilized for irrigation purposes shall be managed so that it does not stand in the application field for more than 24 hours.
- Implement odor control measures as contained in the Plan, which may include, but not be limited to the following:
 1. Ration/diet manipulation
This approach involves the alteration of feed in order to reduce the volume of substrate available for anaerobic activity. The approach includes reducing the nitrogen content of food, phase feeding, repartitioning agents, improved animal genetics, and various feed additives.
 2. Manure management
Utilize best management practices for manure management, including minimizing the time between excretion and application, and aeration of retention basins.

Additionally, implement the following additional best management practices:

Manure Collection Areas

- Clean out manure generated at the freestall barns daily and corrals at least twice a year, or more frequently as necessary to minimize odors;
- Keep cattle as dry and clean as possible at all times;
- Scrape manure from the corrals and bedding from the freestall barns and corrals at a frequency that would reduce or minimize odors.

Manure Treatment and Application

- Minimize moisture content of stockpiled manure/retained solids to a level that would reduce the potential for release of odorous compounds during storage;
- Minimally agitate stockpiled manure during loading for off-site transport;
- Mix process water with irrigation water prior to irrigation (dilution rate shall be adequate to minimize odor levels and maintain appropriate nutrient content in effluent);
- Clean up manure spills upon occurrence;
- Maintain and operate settling ponds and retention ponds to minimize odor levels.

General

- Implement dust suppression measures to prevent the release of odorous compound-carrying fugitive dust;
- During project operations, the dairy operator/owner shall respond to neighbors who are adversely affected by odors generated at the project site and take prompt corrective action.

If necessary and feasible, the animal confinement operation must implement the following additional measures:

1. Manure treatment
Manure treatment methods include maintaining aerobic conditions during storage, aerobic treatment using aerated lagoons or composting, anaerobic digestion, and biochemical treatment.
2. Capture and treatment of emitted gases
This approach includes the use of covered storage pits or lagoons, soil incorporation of applied liquid or solid manure, and dry scrubbers for building exhaust gases including soil absorption beds, bio-filter fields, or packed beds.
3. Enhanced air dispersion
Odor and other air contaminants are diluted to below threshold levels by atmospheric turbulence that increases with wind velocity, solar radiation, and roughness elements such as buildings, trees, or barriers. Sound site selection with adequate separation distance and elevated sources or mechanical turbulence can aid in dispersing odorous compounds and avoiding nuisance conditions.
4. Enhanced land spreading procedures
Procedures may be modified to minimize impacts by avoiding spreading when the wind is blowing towards populated areas, employing technologies to incorporate manure into soil during or directly after application (i.e. injection, plowing, disking), or spreading manure in thin layers during warm weather.

Mitigation Measure AQ-7b:

Implement the nuisance control measures set forth in Mitigation Measures HAZ-1a and HAZ-1b. The nuisance control measures include best management practices and manure management measures that would also act to control odors.

Potential Environmental Effects of Measure: All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project site. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

Significance after Mitigation: Implementation of the foregoing measures would reduce the magnitude of this potential effect by requiring housekeeping and management measures. While there may be an increased potential for nuisance conditions with the dairy expansion, the proposed expansion would not reduce the setback distances specified by the ACO, and with implementation of the above mitigation measures, the potential impact from odors would be reduced to less than significant.

Implementation/Monitoring: Implementation of these measures would be the responsibility of the project applicant. The Merced County Division of Environmental Health shall monitor for compliance. Mitigation Measure AQ-7a shall be implemented prior to issuance of a building permit. Mitigation Measure AQ-7b shall be implemented: prior to issuance of a building permit and throughout ongoing operations (MM HAZ-1a and MM HAZ-1b).

Impact AQ-8: Conflict with or obstruct implementation of the applicable air quality plan (Criterion III.a)

Implementation of the Oliveira Dairy Expansion project would not conflict with or obstruct implementation of the SJVAPCD air quality attainment plan. For this reason, the impact would be less than significant.

As stated above in the regulatory environment, for nonattainment criteria pollutants, the SJVAPCD has attainment plans in place that identify strategies to bring regional emissions into compliance with federal and state air quality standards. Projects and uses that are consistent with the assumptions used to develop the plans, and implement strategies to implement the plans, would not jeopardize attainment of the air quality levels identified in the plans.

Local General Plan land use designations and population projections form the basis of SJVAPCD attainment planning. The proposed Oliveira Dairy Expansion is a use consistent with the 2030 Merced County General Plan land use designation of the project site and area used to generate air emission projections incorporated into the SJVAPCD attainment plans. Thus, implementation of the project would not conflict with the assumptions and emissions estimates contained within the plans as approved by the ARB and the EPA. The SJVAPCD regulates air emissions at the Oliveira Dairy through its ATC/PTO permit process, and has required operational mitigation measures to reduce air emissions at the dairy.

While the proposed project would contribute to regional emissions, because the proposed uses are consistent with Merced County's land use designation for the site, and the project would comply with applicable rules and regulations of the SJVAPCD as described above, the proposed project would not conflict with or obstruct implementation of any SJVAB attainment plan or the SIP.

Significance of Impact: Less than significant.

Mitigation Measure AQ-8: None required.