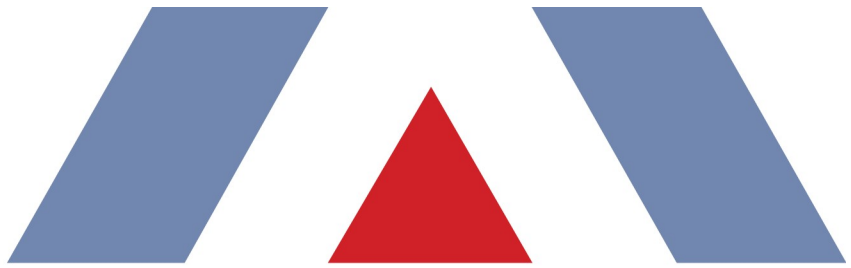


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## APPENDIX D

### Ambient Air Quality Analysis and Health Risk Assessment

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## **AMBIENT AIR QUALITY ANALYSIS**

### **Godinho Heifer Ranch Expansion**

**13140 Johnson Road  
Los Banos, CA 93635  
Merced County**

Prepared By:

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Project 190505.0264



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## 1. EXECUTIVE SUMMARY

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This document contains the ambient air quality analysis (AAQA) performed on behalf of Environmental Planning Partners, Inc. for an expansion of the existing Godinho Heifer Ranch operation in Merced County, California. The intent of the AAQA is to determine if the proposed expansion has the potential to impact ambient air quality through a violation of the Ambient Air Quality standards (AAQS) or a substantial contribution to existing or projected air quality standards.

Under the provisions of the Federal Clean Air Act, the San Joaquin Valley Air Basin, including Merced County, has been designated as attainment/unclassified for the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), and sulfur dioxide (SO<sub>2</sub>); and attainment for particulate matter between 2.5 and 10 micrometers in diameter (PM<sub>10</sub>). The Merced County portions of the San Joaquin Valley Air Basin have been designated as non-attainment/extreme for the ozone (O<sub>3</sub>) eight-hour average standard and non-attainment for the particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>) standard. The Merced County portions of the San Joaquin Valley Air Basin have been designated as non-attainment/severe with the State one-hour standard for O<sub>3</sub>; non-attainment for the PM<sub>10</sub>, PM<sub>2.5</sub> and eight-hour O<sub>3</sub> standards; unclassified for hydrogen sulfide (H<sub>2</sub>S) and visibility reducing particles; attainment/unclassified for CO; and attainment for all other compounds for which a California Ambient Air Quality Standards (CAAQS) exists. In order to determine whether a project will cause or contribute significantly to an AAQS violation, the maximum impacts attributable to the project are added to the existing background concentrations and are compared to the applicable AAQS. If an AAQS 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. The San Joaquin Valley Air Pollution Control District (SJVAPCD) has developed alternative SILs for fugitive emissions of PM<sub>10</sub> and PM<sub>2.5</sub>. If a source's maximum impacts are below the applicable SIL, the project is judged to not cause or contribute significantly to an AAQS violation or cause an increment violation.

For the Godinho Heifer Ranch expansion project, maximum predicted concentrations of NO<sub>2</sub>, SO<sub>2</sub>, CO, PM<sub>10</sub>, and PM<sub>2.5</sub> were predicted based on an analysis of the project-related emissions and air dispersion modeling. Emissions were calculated using generally accepted emission factors. Ambient air concentrations were predicted for the 1-hour, 3-hour, 8-hour, 24-hour and annual averaging periods using the most recent version of EPA's AMS/EPA Regulatory Model - AERMOD (recompiled for the Lakes ISC-AERMOD View interface).

Proposed emissions for the project will not cause or contribute to a violation of any NAAQS or CAAQS for any of the averaging periods for NO<sub>2</sub>, SO<sub>2</sub>, CO, or H<sub>2</sub>S, or cause an increment violation of the SJVAPCD SILs for the annual and 24-hour averaging periods for PM<sub>10</sub> and PM<sub>2.5</sub>.

In accordance with the SJVAPCD's *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015), the potential impact to air quality attributable to the proposed project is determined to be less than significant.

## 2. INTRODUCTION

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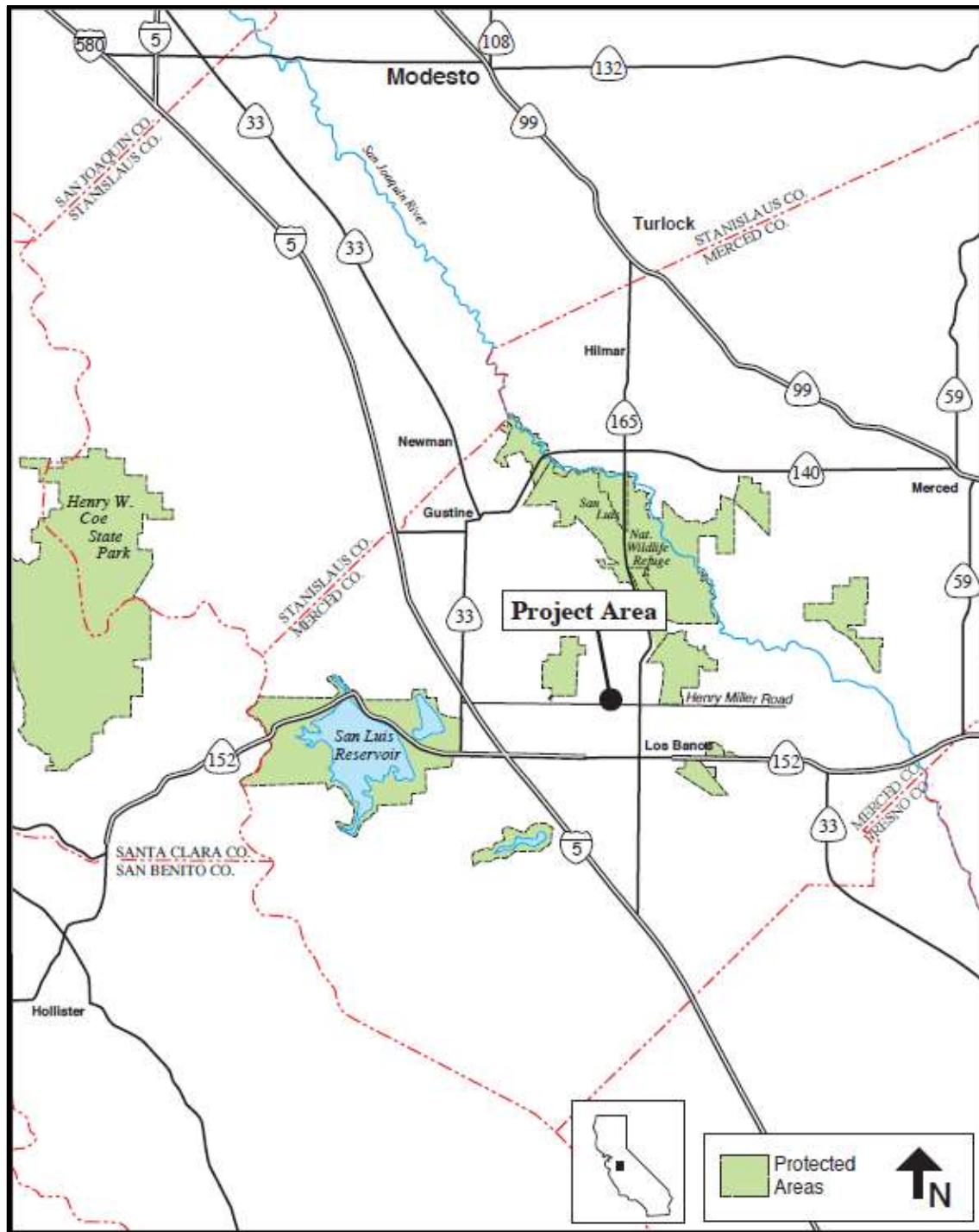
This Ambient Air Quality Analysis (AAQA) is provided as a service of Insight Environmental Consultants, Inc., a Trinity Consultants company performed on behalf of Environmental Planning Partners, Inc. for an expansion of the existing Godinho Heifer Ranch operation in Merced County, California (**Figure 2-1**). This AAQA was prepared pursuant to the San Joaquin Valley Air Pollution Control District's (SJVAPCD) *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI), (SJVAPCD 2015a) and the California Environmental Quality Act (CEQA).

A potentially significant impact to air quality, as defined by the CEQA Appendix G Environmental Checklist Form (not included herein), would occur if the project caused one or more of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or substantial contribution to an existing or projected air quality standard;
- Cause a cumulatively considerable net increase of any criteria pollutant for which the project region is designated non-attainment under an applicable Federal or State ambient air quality standard (including emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; and/or
- Create objectionable odors affecting a substantial number of people.

The intent of the AAQA is to determine if the project has the 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. Impacts to ambient air quality are evaluated based on the project-related emission of criteria pollutants. This analysis is limited to the potential impacts resulting from project-related emissions of nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), particulate matter between 2.5 and 10 micrometers in diameter (PM<sub>10</sub>), particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>), and hydrogen sulfide (H<sub>2</sub>S). Project-related emissions are based on the proposed increase in the number of cattle and the additional on-site mobile sources required for the expansion.

Figure 2-1. Location Map



## 2.1. PROJECT DESCRIPTION

The existing heifer ranch is located at 13140 Johnson Road in Los Banos, California, which is in the County of Merced. The facility will not be located within 1,000 feet of a K-12 school.

After modification, the heifer ranch will house approximately 3,501 head of cattle. The existing and proposed herd configuration is provided in Table 2-1. The heifer ranch will continue to operate 24 hours per day and 365 days per year.

**Table 2-1. Herd Configuration – Existing and Proposed**

	<b>Current</b>	<b>Proposed</b>	<b>Increment</b>
Milk Cows	0	0	0
Dry Cows	0	471	471
Bred Heifers 15-24 mos.	0	1,262	1,262
Heifers 7-14 mos.	1,632	354	-1,278
Heifers 4-6 mos.	372	882	510
Calves 0-3 mos.	0	532	532
Bulls	0	0	0
<b>TOTAL</b>	<b>2,004</b>	<b>3,501</b>	<b>1,497</b>

The proposed structure construction would consist of four new freestall barns. The proposed expansion would include construction of 314,200 square feet of new buildings.

### 3. BACKGROUND OF AIR QUALITY STANDARDS

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Protection of the public health is maintained through the attainment and maintenance of standards for ambient concentrations of various compounds in the atmosphere and the enforcement of emission limits for individual stationary sources. The Federal Clean Air Act requires that the U.S. Environmental Protection Agency (EPA) establish National Ambient Air Quality Standards (NAAQS) to protect the health, safety, and welfare of the public. NAAQS have been established for ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) and lead (Pb). California has also adopted ambient air quality standards (CAAQS) for these "criteria" air pollutants that are more stringent than the corresponding NAAQS along with standards for hydrogen sulfide (H<sub>2</sub>S), vinyl chloride (chloroethene) and visibility reducing particles. In 2010, the U.S. Environmental Protection Agency (EPA) promulgated a new 1-hour NO<sub>2</sub> and SO<sub>2</sub> primary NAAQS, which are considerably less than the current CAAQS. Compliance with the new standards must be determined for all new and modified sources that are subject to the ambient air quality standard analysis requirement in SJVAPCD Rule 2201, Section 4.14. Current Federal and State ambient air quality standards are presented in **Table 3-1**.

Responsibility for regulation of air quality in California rests with the California Air Resources Board (CARB), the multi-county Air Quality Management Districts and Unified Air Pollution Control Districts, and single-county Air Pollution Control Districts, with oversight responsibility held by the EPA. CARB is responsible for regulation of mobile source emissions, establishment of State ambient air quality standards, research and development, and oversight and coordination of the activities of the regional and local air quality agencies. The regional and local air quality agencies are primarily responsible for regulating stationary source emissions and for monitoring ambient pollutant concentrations.

The Clean Air Act Amendments of 1977 required states to identify areas that were not in attainment with the NAAQS and to develop State Implementation Plans containing strategies to bring these non-attainment areas into compliance. The project location has been designated as attainment /unclassified for the NAAQS for CO, NO<sub>2</sub>, and SO<sub>2</sub>; and attainment for PM<sub>10</sub>. The project location has been designated as non-attainment/extreme for the O<sub>3</sub> eight-hour average standard and non-attainment for the PM<sub>2.5</sub> standard. A Federal designation for lead has not been made and NAAQS do not exist for O<sub>3</sub> (1-hour average), hydrogen sulfide (H<sub>2</sub>S), sulfates, vinyl chloride or visibility reducing particles. The project location has been designated as non-attainment/severe with the State one-hour standard for O<sub>3</sub>, non-attainment for the PM<sub>10</sub>, PM<sub>2.5</sub>, and eight-hour O<sub>3</sub> standards; unclassified for H<sub>2</sub>S and visibility reducing particles; attainment /unclassified for CO; and attainment for all other compounds for which a State standard exists. **Table 3-2** provides the San Joaquin Valley Air Basin's designation and classification based on the various criteria pollutants under both State and Federal standards.

**Table 3-1. Federal & California Ambient Air Quality Standards**

		NAAQS	CAAQS
Pollutant	Averaging Time	Concentration	
O <sub>3</sub>	8-Hour	0.070 ppm (137 µg/m <sup>3</sup> ) <sup>c</sup>	0.070 ppm (137 µg/m <sup>3</sup> )
	1-Hour	<sup>a</sup>	0.09 ppm (180 µg/m <sup>3</sup> )
CO	8-Hour	9 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )
	1-Hour	35 ppm (40 mg/m <sup>3</sup> )	20 ppm (23 mg/m <sup>3</sup> )
NO <sub>2</sub>	Annual Average	53 ppb (100 µg/m <sup>3</sup> )	0.030 ppm (56 µg/m <sup>3</sup> )
	1-Hour	100 ppb (188.68 µg/m <sup>3</sup> )	0.18 ppm (338 µg/m <sup>3</sup> )
SO <sub>2</sub>	3-Hour	0.5 ppm (1,300 µg/m <sup>3</sup> )	
	24 Hour	0.14 ppm (365 µg/m <sup>3</sup> )	0.04 ppm (105 µg/m <sup>3</sup> )
	1-Hour	75 ppb (196 µg/m <sup>3</sup> )	0.25 ppm (655 µg/m <sup>3</sup> )
Particulate Matter (PM <sub>10</sub> )	Annual Arithmetic Mean	<sup>b</sup>	20 µg/m <sup>3</sup>
	24-Hour	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
Fine Particulate Matter (PM <sub>2.5</sub> )	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>
	24-Hour	35 µg/m <sup>3</sup>	
Sulfates	24-Hour		25 µg/m <sup>3</sup>
Pb <sup>d</sup>	Rolling Three-Month Average	0.15 µg/m <sup>3</sup>	
	30 Day Average		1.5 µg/m <sup>3</sup>
H <sub>2</sub> S	1-Hour		0.03 ppm (42 µg/m <sup>3</sup> )
Vinyl Chloride (chloroethene)	24-Hour		0.010 ppm (26 µg/m <sup>3</sup> )
Visibility Reducing particles	8 Hour (1000 to 1800 PST)		<sup>e</sup>

ppm = parts per million

mg/m<sup>3</sup> = milligrams per cubic meter

µg/m<sup>3</sup> = micrograms per cubic meter

ppb = parts per billion

<sup>a</sup> 1-Hour O<sub>3</sub> standard revoked effective June 15, 2005.

<sup>b</sup> Annual PM 10 standard revoked effective December 18, 2006.

<sup>c</sup> EPA finalized the revised (2008) 8-hour O<sub>3</sub> standard of 0.075 ppm on March 27, 2008. The 1997 8-hour O<sub>3</sub> standard of 0.08 ppm has not been revoked. In the January 19, 2010 Federal Register, EPA proposed to revise the 2008 O<sub>3</sub> NAAQS of 0.075 ppm to a NAAQS in the range of 0.060 to 0.070 ppm. EPA expects to finalize the revised NAAQS, which will replace the 0.075 ppm NAAQS, by July 29, 2011.

<sup>d</sup> On October 15, 2008, EPA strengthened the Pb standard.

<sup>e</sup> Statewide Visibility Reducing Particle Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

(SJVAPCD 2017a and CARB 2017a)

**Table 3-2. San Joaquin Valley Air Basin Attainment Status**

Pollutant	NAAQS <sup>a</sup>	CAAQS <sup>b</sup>
O <sub>3</sub> , 1-hour	No Federal Standard <sup>f</sup>	Nonattainment/Severe
O <sub>3</sub> , 8-hour	Nonattainment/Extreme <sup>e</sup>	Nonattainment
PM <sub>10</sub>	Attainment <sup>c</sup>	Nonattainment
PM <sub>2.5</sub>	Nonattainment <sup>d</sup>	Nonattainment
CO	Attainment/Unclassified	Attainment/Unclassified
NO <sub>2</sub>	Attainment/Unclassified	Attainment
SO <sub>2</sub>	Attainment/Unclassified	Attainment
Pb (Particulate)	No Designation/Classification	Attainment
H <sub>2</sub> S	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing particulates	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

<sup>a</sup> See 40 CFR Part 81

<sup>b</sup> See CCR Title 17 Sections 60200-60210

<sup>c</sup> On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM<sub>10</sub> National Ambient Air Quality Standard (NAAQS) and approved the PM<sub>10</sub> Maintenance Plan.

<sup>d</sup> The Valley is designated nonattainment for the 1997 PM<sub>2.5</sub> NAAQS. EPA designated the Valley as nonattainment for the 2006 PM<sub>2.5</sub> NAAQS on November 13, 2009 (effective December 14, 2009).

<sup>e</sup> Though the Valley was initially classified as serious nonattainment for the 1997 8-hour O<sub>3</sub> standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

<sup>f</sup> Effective June 15, 2005, the EPA revoked the federal 1-hour O<sub>3</sub> standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour O<sub>3</sub> nonattainment areas continue to apply to the SJVAB.

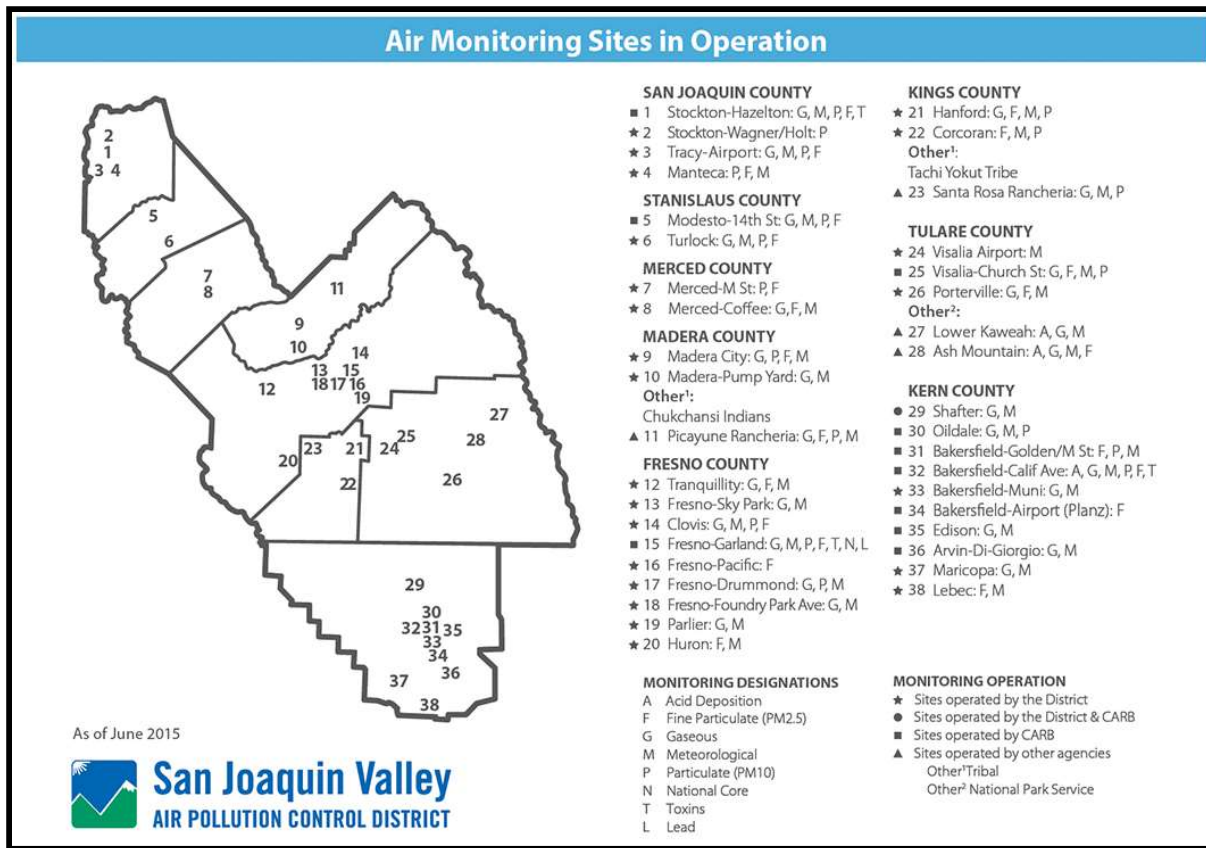
(SJVAPCD 2017a)

The SJVAPCD along with the CARB operates an air quality monitoring network that provides information on average concentrations of those pollutants for which State or Federal agencies have established ambient air quality standards. Information from the various monitoring stations is available from the agency web sites. A map of the various monitoring stations in the San Joaquin Valley is provided in **Figure 3-1**.

For the purposes of establishing background concentrations of applicable criteria pollutants, this AAQA relied on EPA's AirData and CARB monitoring values, the raw data for which were collected during 2017 and 2018<sup>1</sup> at CARB/SJVAPCD monitoring stations. Background values were selected from various monitoring stations based on closest proximity to the project site. **Table 3-3** provides the background concentrations applicable to the project area. No recent data is available for hydrogen sulfide, vinyl chloride or lead in Merced County or adjacent Counties.

<sup>1</sup> The exception is the one-hour NO<sub>2</sub> background value, which EPA requires to be based on a 3-year average. The SJVAPCD's statistical analysis was based on the period 2014 to 2016.

Figure 3-1. San Joaquin Valley APCD Monitoring Network



(SJVAPCD 2017b)

Table 3-3. Background Concentrations for the Project Vicinity

Pollutant	Averaging Period	Background Concentration µg/m <sup>3</sup>	Reference
NO <sub>2</sub>	1-hour	83.5	SJVACPD FTP Server, Merced Co. (SJVAPCD 2017c)
	Annual	14.2	Merced County, 2018 (CARB 2019)
SO <sub>2</sub>	1-hour	20.3	Fresno Co., 2018 (USEPA 2019)
	3-hour	18.3	Scaled from SO <sub>2</sub> 1-hour concentration <sup>2</sup>
	24-hour	7.3	Fresno Co., 2018 (USEPA 2019)
CO	1-hour	3330	Stanislaus County, 2018 (USEPA 2019)
	8-hour	2950	Stanislaus County, 2018 (USEPA 2019)
PM <sub>2.5</sub>	24-hour	88.2	Merced County, 2018 (CARB 2019)
	Annual	15.1	Merced County, 2018 (CARB 2019)
PM <sub>10</sub>	24-hour	142.7	Merced County, 2018 (CARB 2019)
	Annual	34.6	Merced County, 2018 (CARB 2019)

<sup>1</sup> The District processed the NO<sub>2</sub> monitoring data using the guidance provided in Appendix S of Part 50.

<sup>2</sup> The SO<sub>2</sub> 3-hour Concentration was scaled from the SO<sub>2</sub> 1-hour Concentration using the recommended 0.9 factor (OEHHA 2015).

Merced County, where the project area is located, is included among the eight counties that comprise the SJVAPCD. The SJVAPCD acts as the regulatory agency for air pollution control in the Basin and is the local agency empowered to regulate air pollutant emissions for the air basin. In order to demonstrate that a proposed project will not cause further air quality degradation, projects must demonstrate consistency with the SJVAPCD's adopted Air Quality Attainment Plans.

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 (BACT) is required on specific types of equipment. Stationary sources are required to offset stationary source emission increases along with increases in cargo carrier emissions if the specified threshold levels are exceeded (Rule 2201, 4.7.1). The SJVAPCD uses this mechanism to ensure that all stationary sources within the project area are subject to the standards of the SJVAPCD to ensure that new or modified sources will not realize a net increase of criteria air pollutants.

Stationary sources subject to SJVAPCD New and Modified Stationary Source Review Rule must also 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 APCO shall take into account the increases in minor and secondary sources emissions as well as the mitigation of emissions through offsets...." The Air Pollution Control Officer (APCO) also has discretion to exempt new or modified sources that are exempt from public notification requirements<sup>2</sup> from this section of Rule 2201. Public notification and publication is required for projects meeting any of the following criteria:

- New Major Sources and Major Modifications;
- Applications which include a new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one affected pollutant;
- Modifications that increase the Stationary Source Potential to Emit (SSPE1) from a level below the emissions offset threshold level to a level exceeding the emissions offset threshold level for one or more pollutants;
- New Stationary Sources with post-project Stationary Source Potential to Emit (SSPE2) exceeding the emissions offset threshold level for one or more pollutants; or
- Any permitting action resulting in a Stationary Source Project Increase in Permitted Emissions (SSIPE) exceeding 20,000 pounds per year for any one pollutant.

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<sup>2</sup> *Public Notification and Publication Requirements*, San Joaquin Valley Air Pollution Control District Rule 2201 Section 5.4, amended April 21, 2011.

## 4. AIR QUALITY MODELING

This section describes the methodology used to predict the potential impact to ambient air quality attributable to the dispersion of emissions of NO<sub>2</sub>, SO<sub>2</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub> and H<sub>2</sub>S from the proposed heifer ranch operation expansion.

### 4.1. PROJECT EMISSIONS

The basis for evaluating the potential impact to ambient air quality is the identification of air pollution sources. Emissions based on the current configuration of the heifer ranch are considered to be existing emissions.<sup>3</sup> Based on this fact, the facility's existing emissions are not included in the emissions proposed by the subject project. Therefore, emissions from the heifer ranch modifications will be restricted to the increase in emissions for the proposed increase in the number of cattle (**Table 2-1**) and the additional on-site mobile sources required for the expansion. The potential emission sources with increased emissions addressed in the AAQA are listed in **Table 4-1**.

**Table 4-1. Sources of Potential Emissions**

Source ID	Description
CTI	Commodity Delivery Trucks Idling
CTT	Commodity Delivery Trucks Travel
SRTI	Manure Removal Trucks Idling
SRTT	Manure Removal Trucks Travel
FTD1-2	Feed Delivery
BTD1-3	Bedding Delivery
FSB1-4*	Freestall Barns
SHADE1-2*	Shade Barns
MLT*	Manure Loading Tractor
*FSB2, SHADE1-2 and MLT were all modeled but had no increase in emissions.	

Emissions attributable to animal movement were estimated by the SJVAPCD using spreadsheets developed by the SJVAPCD to calculate emissions, which are provided in **Appendix A**. The incremental increases in emissions attributable to animal movement were calculated by comparing the pre- and post-project emissions from each animal housing source. SJVAPCD-approved control efficiencies were applied to PM<sub>10</sub> emission factors. To generate PM<sub>2.5</sub> emissions, the PM<sub>10</sub> emission results for these emission sources were multiplied by the PM<sub>2.5</sub> fraction of 11.4% from the livestock fugitive dust profile in the California Emission Inventory Data and Reporting System (CEIDARS) developed by CARB (SCAQMD 2006). Housing sources that had an increase in PM<sub>10</sub> and PM<sub>2.5</sub> emissions for 24-hour and annual periods are summarized in **Table 4-2**.

<sup>3</sup> Personal Communication with Leland Villalvazo, SJVAPCD, June 15, 2007.

**Table 4-2. Modeled Sources of Emissions Attributable to Animal Movement**

Source ID	PM <sub>10</sub> Emissions		PM <sub>2.5</sub> Emissions	
	Lbs/yr	Lbs/24-hr	Lbs/yr	Lbs/24-hr
FSB1	879	2.4	100	0.27
FSB2	281	0.8	32	0.09
FSB3	624	1.7	71	0.19

On-site mobile sources for this facility with increase emissions include a diesel-fueled feed delivery tractor, a bedding delivery tractor, manure removal trucks, and commodity delivery trucks. The increased herd size will require additional tractor use for additional tractor use for feed delivery and bedding delivery. Additional truck trips will be required for manure removal trucks and commodity delivery trucks.

Emissions for tractors were calculated using the EPA's *Nonroad Compression-Ignition Engines - Exhaust Emission Standards* for the appropriate engine horsepower (HP) and year and load factors for the appropriate engine horsepower from California Emissions Estimator Model (CalEEMod) Appendix D, Tables 3.3 and 3.4 (CAPCOA 2013). Diesel truck running emissions are based on EMFAC2017 emission factors specific to Merced County for vehicle category "T7 Ag." Diesel trucks were assumed to have 15 minutes of idling per visit. Diesel truck combustion emissions of PM<sub>2.5</sub> were set equal to PM<sub>10</sub> emissions. There will be no increases in 1-hour emissions because additional truck and tractor usage will not occur in the same 1-hour period as the existing equipment. In order to have a possible increase in the worst case one-hour emissions from the Godinho Heifer Ranch, one of the three following scenarios would need to occur and be evaluated:

- New equipment must operate at the facility as a result of the project;
- An on-site piece of equipment must operate less than one hour during the worst-case 1-hour period pre-project and then must increase the operational time during the worst-case 1-hour period post-project.
- The project must increase the number trucks entering and exiting the facility over the number of pre-project trucks entering and exiting the facility during the worst-case 1-hour period.

The Godinho Heifer Ranch Expansion Project does not propose any new pieces of equipment and all existing equipment currently operates the full hour during the worst-case hour. The project also does not propose an increase over the current worst-case 1-hour period of trucks entering or exiting the facility. Based on these findings the worst-case 1-hour period post-project emissions will be equal to or less than the worst-case 1-hour period pre-project. Therefore, the incremental increase for this project in regards to 1-hour periods is zero. Based on the same philosophy outlined above for 1-hour emissions there will not be an increase in max 3-hour and 8-hour emissions for any trucks. Truck travel emissions will not move closer to any receptors as a result of the expansion. Additionally, there will be no increase in rendering service trucks, and manure scraping or loading at the facility.

However, the Project will result in emissions moving closer to the facility boundary and closer to receptors. Feed delivery and bedding delivery tractors will operate closer to some receptors, therefore, hourly emissions from new feed and bedding delivery routes require analysis for 1-hour AAQS. Based on the same philosophy outlined above for 1-hour emissions; max 3-hour and 8-hour emissions from feed delivery and bedding delivery will require analysis for AAQS.

Calculation worksheets for emissions from the on-site mobile sources are provided in Appendix B and are summarized in **Table 4-3**.

**Table 4-3. On-Site Mobile Source Combustion Emissions**

Source ID	NO <sub>2</sub> Emissions		SO <sub>2</sub> Emissions		CO Emissions		PM <sub>10</sub> /PM <sub>2.5</sub> Emissions	
	Lbs/hr	Lbs/yr	Lbs/hr	Lbs/yr	Lbs/hr	Lbs/8-hr	Lbs/24-hr	Lbs/yr
CTT	0.00E+00	4.56E-01	0.00E+00	4.01E-04	0.00E+00	0.00E+00	0.00E+00	2.79E-02
SRTT	0.00E+00	3.98E+00	0.00E+00	3.50E-03	0.00E+00	0.00E+00	0.00E+00	2.43E-01
BTD1	1.79E-02	4.49E+00	3.01E-04	7.52E-02	2.24E-01	1.12E+00	4.49E-03	2.24E-01
BTD2	4.00E-03	1.00E+00	6.71E-05	1.68E-02	5.00E-02	2.50E-01	1.00E-03	5.00E-02
BTD3	1.09E-02	2.73E+00	1.83E-04	4.57E-02	1.36E-01	6.81E-01	2.73E-03	1.36E-01
FDT1	6.76E-02	2.47E+01	1.13E-03	4.14E-01	5.92E-01	5.92E-01	3.38E-03	1.23E+00
FDT2	1.51E-02	5.51E+00	2.53E-04	9.23E-02	1.32E-01	1.32E-01	7.54E-04	2.75E-01
CTI	0.00E+00	1.41E+00	0.00E+00	9.49E-04	0.00E+00	0.00E+00	0.00E+00	2.61E-02
SRTI	0.00E+00	1.35E+00	0.00E+00	9.12E-04	0.00E+00	0.00E+00	0.00E+00	2.51E-02

The SJVAPCD's *H2S AERMOD Hourly Emission File Generator* (SJVAPCD 2012) 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 will be no increase in the surface area of the existing lagoons, there will be no increase in H<sub>2</sub>S emission associated with the proposed expansion.

## 4.2. DISPERSION MODELING

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 heifer ranch for the 1-hour, 3-hour, 8-hour, 24-hour and annual averaging periods. All of the AERMOD regulatory default parameters were employed. Rural dispersion parameters were used because the facility and surrounding land are considered "rural" under the Auer land use classification method.

The animal housing areas emissions were modeled as area sources. Unit emission rates for the area sources of 1 g/sec divided by the area of the source were input into AERMOD. The travel route for the feed and bedding delivery tractors, manure removal trucks, and commodity trucks were modeled as a line sources, which represents a series of volume sources, with a unit emission rate of 1 g/sec. The manure loading tractor, manure removal truck idling, and commodity truck idling were modeled as point sources, with a unit emission rate of 1 g/sec.

### 4.2.1. Meteorological Data

The SJVAPCD provided meteorological data for Merced County, California to be used for projects within Merced County. SJVAPCD-approved, AERMET processed meteorological datasets for calendar years 2013 through 2017<sup>4</sup> was input into AERMOD. This was the most recent available dataset available at the time the modeling runs were conducted.

<sup>4</sup> Provided via website, San Joaquin Valley Air Pollution Control District (SJVAPCD), [http://12.219.204.27/public/Modeling/Meteorological\\_Data/AERMET\\_v16216/Modesto\\_23258/](http://12.219.204.27/public/Modeling/Meteorological_Data/AERMET_v16216/Modesto_23258/)

#### 4.2.2. Receptors

Existing land uses in the area where the heifer ranch and proposed expansion are located are predominantly agriculture. There are scattered rural residences in the general area of the project; most of which are associated with local agricultural operations. A fenceline grid was used to define a dense receptor grid around the property boundary using Lakes ISC-AERMOD View interface. The fenceline spacing between receptors along the fenceline was set to 25 meters. Three tiers were specified, the first extended a distance of 100 meters from the fenceline with 25 meter spacing, the second extended a distance of 200 meters from the first tier with 50 meter spacing, and the third extended a distance of 200 meters from the second tier with 100 meter spacing. The spacing between receptors perpendicular to the fenceline was set to 25 meters. A total of 1,546 receptors were generated for the fenceline grid.

### 4.3. MODELING RESULTS

Plot files generated by AERMOD were imported to a Microsoft Access based post-processor AAQA-PSD (developed by the SJVAPCD), where unit emission rates were converted to pollutant-specific emission rates based on the emissions provided in **Tables 4-2** and **4-3**. Background concentrations from **Table 3-3** were input to AAQA-PSD. Based on this data, a report was generated which provides the maximum concentrations per emission source, background concentration and total concentration for each averaging period. For each averaging period, the total concentration is compared to the applicable AAQS and designated as a “pass” or “fail.”

As shown in the AAQA-PSD report provided in Appendix C and **Table 4-4**, air dispersion modeling demonstrates that the maximum impacts attributable to the project, when considered in addition to the existing available background concentrations, are below the applicable ambient air quality standard for all of the averaging periods for NO<sub>2</sub>, SO<sub>2</sub>, CO and H<sub>2</sub>S.

Compliance with the Federal NO<sub>2</sub> one-hour standard was based on a modeling procedure developed by the SJVAPCD (SJVAPCD 2010). The most conservative approach, referred to as Tier I option 1, requires that the maximum one-hour modeling concentration be added to the SJVAPCD’s Air Quality Design Value for the nearest monitoring station (see **Table 3-3**). Since the maximum 1-hour emission rate is not increasing as a result of this project the Tier I analysis demonstrates compliance with the Federal NO<sub>2</sub> one-hour standard.

**Table 4-4. 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 <sub>2</sub>	1-hour	83.5	17.94	101.44	188.68	339
	Annual	14.2	0.04	14.24	100	---
SO <sub>2</sub>	1-hour	20.3	0.30	20.6	195	655
	3-hour	18.3	0.11	18.4	1300	---
	24-hour	7.3	0.01	7.31	---	105
CO	1-hour	3330	158.37	3488	40,000	23,000
	8-hour	2950	19.55	2970	10,000	10,000
PM <sub>10</sub>	24-hour	142.7	10.30	<b>153.00</b>	150	50
	Annual	34.6	1.76	<b>36.36</b>	50	20
PM <sub>2.5</sub>	24-hour	88.2	1.19	<b>89.39</b>	35	---
	Annual	15.1	0.20	<b>15.30</b>	12	12
H <sub>2</sub> S	1-hour	N/A	0.000	0.00	---	42

Background 24-hour and annual concentrations of PM<sub>10</sub> and the 24-hour concentration of PM<sub>2.5</sub> exceed their respective ambient air quality standards. Therefore, these averaging periods for PM<sub>2.5</sub> and PM<sub>10</sub> are evaluated in accordance with the Prevention of Significant Deterioration (PSD) procedure in Title 40, Code of Federal Regulations (CFR), Part 52.21. It is EPA's policy to use significant impact levels (SIL) to determine whether a proposed new or modified source will cause or contribute significantly to an AAQS or PSD increment violation. The SJVAPCD has developed SILs for fugitive emissions of PM<sub>10</sub> and PM<sub>2.5</sub>.<sup>5</sup> As shown in **Tables 4-2 and 4-3**, 99% of the project's predicted PM<sub>10</sub> concentration is attributable to fugitive PM<sub>10</sub> emissions from animal movement. Therefore, SJVAPCD SILs are applicable to this project. If a source's maximum impacts are below the SIL, the source is judged to not cause or contribute significantly to an AAQS or increment violation.

A comparison of the proposed impact from the project to the SJVAPCD SILs, as shown in **Table 4-5**, demonstrates that the modeled PM<sub>10</sub> and PM<sub>2.5</sub> impacts directly attributable to the project are below the applicable SJVAPCD significance levels for the 24-hour and annual averaging periods of PM<sub>10</sub> and the 24-hour averaging period of PM<sub>2.5</sub> and therefore will not cause an increment violation of any SJVAPCD SIL.

**Table 4-5. 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 <sub>10</sub>	24-hour	10.30	10.4
	Annual	1.76	2.08
PM <sub>2.5</sub>	24-hour	1.19	2.5
	Annual	0.20	0.63

Based on the results of the air dispersion modeling, comparisons to AAQs and applicable SILs, *the impact to air quality is not considered to be significant.*

<sup>5</sup> Personal Communication with Yu Vu, San Joaquin Valley Air Pollution Control District, August 15, 2012

## 5. CONCLUSIONS

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In accordance with the San Joaquin Valley Air Pollution Control District's *Guide for Assessing and Mitigating Air Quality Impacts* air dispersion modeling demonstrates that the ambient air quality impact attributable to the proposed project is determined to be less than significant based on the following conclusions:

- Proposed emissions for the project will not cause or contribute to a violation of any NAAQS or CAAQS for any of the averaging periods for NO<sub>2</sub>, SO<sub>2</sub>, CO, or H<sub>2</sub>S or cause an increment violation of the SJVAPCD SILs for PM<sub>10</sub> and PM<sub>2.5</sub>.

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## APPENDIX A: FUGITIVE EMISSION ESTIMATION WORKSHEETS

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# Name

# Cow Housing Summary

## Applicability

Use this spreadsheet to enter data from the Engineer's Dairy Calculator. Entries here will be linked to other worksheets. After completion, proceed to RMR worksheet for further entries.

Author or updater

Matthew Cegielski

Last Update

September 24, 2018

Facility:  
ID#:

Goninho Heifer Ranch

0

Not Set

Project #:

\*Note: Pre-Project Corrals 1 is the same location as Post-Project Shade Barn 1 and Freestall Barn 4. Emissions from Pre-Project Corrals 1 were greater than the combined totals of Post-Project Shade Barn 1 and Freestall Barn 4. Therefore, emissions have been set to zero.

\*\*Note: Pre-Project Corrals 2 is the same location as Post-Project Shade Barn 2. Emissions from Pre-Project Corrals 2 were greater than Post-Project Shade Barn 2 a. Therefore, emissions have been set to zero.

## Potential to Emit - Cow Housing

Housing Name(s) or #(s)	Type of Cow	# of Cows	VOC (lb/hr)	VOC (lb/yr)	NH <sub>3</sub> (lb/hr)	NH <sub>3</sub> (lb/yr)	PM <sub>10</sub> (lb/hr)	PM <sub>10</sub> (lb/yr)
Shade Barn #1*	Calves	200	0.0000	0	0.0000	0	0.0000	0
Shade Barn #2**	Calves	332	0.0000	0	0.0000	0	0.0000	0
Freestall Barn #1	Dry Cows/Support Stock	1013	0.5042	4,390	0.8375	7,357	0.1000	879
Freestall Barn #2	Support Stock	340	0.0792	700	0.1292	1,126	0.0333	281
Freestall Barn #3	Support Stock	716	0.3750	3,257	0.4333	3,783	0.0708	624
Freestall Barn #4*	Support Stock	900	0.0000	0	0.0000	0	0.0000	0

Copy and paste values from the corresponding table in the Engineer Dairy Calculator's RMR Summary worksheet. Paste values only with matched destination formatting. Ensure the same names are lined up by row number. Zero and null entries will be highlighted in red after entry.

### SSIPE RMR Summary

	PM10 lb/hr	PM10 lb/yr	VOC lb/hr	VOC lb/yr	NH3 lb/hr	NH3 lb/yr	H2S lb/yr
Milking Parlor	-	-	-	-	-	-	-
Cow Housing	-2	-16,376	1	6,977	1.125	9,853	-
Liquid Manure	-	-	0	1,538	0.604	5,293	-
Solid Manure	-	-	0	294	0.138	1,211	-
Feed Handling	-	-	1	9,586	-	-	-
Lagoon/Storage Pond	-	-	0	767	0.300	2,628	0
Land Application (Liquid)	-	-	0	803	0.304	2,665	-
Land Application (Solid)	-	-	0	146	0.075	657	-
Solid Manure Storage	-	-	0	110	0.063	548	-

### SSIPE Total Herd Summary

Change in Milk Cows	0
Change in Dairy Head	1,497
Change in Dairy Head (Flushed)	1,497

## Pre-Project Facility Information

- Does this facility house Holstein or Jersey cows?   
Most facilities house Holstein cows unless explicitly stated on the PTO or application.
- Does the facility have an anaerobic treatment lagoon?
- Does the facility land apply liquid manure?   
Answering "yes" assumes worst case.
- Does the facility land apply solid manure?   
Answering "yes" assumes worst case.
- Is any scraped manure sent to a lagoon/storage pond?   
Answering "yes" assumes worst case.

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows					0		
Dry Cows					0		
Support Stock (Heifers, Calves, and Bulls)					0		
Large Heifers					0		
Medium Heifers				1,632	1,632		
Small Heifers				372	372		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves							0

Total Herd Summary	
Total Milk Cows	0
Total Mature Cows	0
Support Stock (Heifers, Calves, and Bulls)	2,004
Total Calves	0
Total Dairy Head	2,004

Pre-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

## Post-Project Facility Information

- Does this facility house Holstein or Jersey cows?   
Most facilities house Holstein cows unless explicitly stated on the PTO or application.
- Does the facility have an anaerobic treatment lagoon?
- Does the facility land apply liquid manure?   
Answering "yes" assumes worst case.
- Does the facility land apply solid manure?   
Answering "yes" assumes worst case.
- Is any scraped manure sent to a lagoon/storage pond?   
Answering "yes" assumes worst case.
- Does this project result in an increase or relocation of uncovered surface area for any lagoon/storage pond?

Post-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows					0		
Dry Cows		471			471		
Support Stock (Heifers, Calves, and Bulls)					0		
Large Heifers		1,262			1,262		
Medium Heifers		354			354		
Small Heifers		882			882		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves						532	532

Total Herd Summary	
Total Milk Cows	0
Total Mature Cows	471
Support Stock (Heifers, Calves, and Bulls)	2,498
Total Calves	532
Total Dairy Head	3,501

Post-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

Control Measure	PM10 Control Efficiency
Shaded corrals (milk and dry cows)	16.7%
Shaded corrals (heifers and bulls)	8.3%
Downwind shelterbelts	12.5%
Upwind shelterbelts	10%
Freestall with no exercise pens and non-manure based bedding	90%
Freestall with no exercise pens and manure based bedding	80%
Fibrous layer in dusty areas (i.e. hay, etc.)	10%
Bi-weekly corral/exercise pen scraping and/or manure removal using a pull type manure harvesting equipment in morning hours when moisture in air except during periods of rainy weather	15%
Sprinkling of open corrals/exercise pens	15%
Feeding young stock (heifers and calves) near dusk	10%

Pre-Project PM10 Mitigation Measures														
Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of <u>Each</u> Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
Corral 1	open corral	medium heifers	1,632	1,632		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Corral 2	open corral	small heifers	372	372		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pre-Project Total # of Cows			2,004			0								

Pre-Project PM10 Control Efficiencies and Emission Factors																	
	Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	Uncontrolled EF (lb/hd-yr)	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)	
1	Corral 1	open corral	medium heifers	1,632	1,632	10.550	8.3%									9.67	
2	Corral 2	open corral	small heifers	372	372	10.550	8.3%									9.67	
Pre-Project Total # of Cows				2,004													

## Post-Project PM10 Mitigation Measures

Post-Project PM10 Mitigation Measures															
	Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
1	Shade Barn 1	open corral	calves	200	200		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Shade Barn 2	open corral	calves	332	332		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post-Project PM10 Mitigation Measures for New Housing Units at an Expanding Dairy															
	Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
1	Freestall Barn 1	freestall	dry cows	471	471		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Freestall Barn 1	freestall	small heifers	542	542		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Freestall Barn 2	freestall	small heifers	340	340		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Freestall Barn 3	freestall	large heifers	362	362		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Freestall Barn 3	freestall	medium heifers	354	354		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Freestall Barn 4	freestall	large heifers	900	900		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post-Project Total # of Cows				3,501	(The post-project total includes dairy cows already on-site and new cows from the expansion.)										

Post-Project PM10 Control Efficiencies and Emission Factors																
	Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	Uncontrolled EF (lb/hd-yr)	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)
1	Shade Barn 1	open corral	calves	200	200	1.370	8.3%	12.5%	10%					15%	10%	0.76
2	Shade Barn 2	open corral	calves	332	332	1.370	8.3%	12.5%	10%					15%	10%	0.76
Post-Project PM10 Control Efficiencies and Emission Factors for New Housing Emissions Units																
	Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	Uncontrolled EF (lb/hd-yr)	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)
1	Freestall Barn 1	freestall	dry cows	471	471	1.370		12.5%	10%	1				15%		0.92
2	Freestall Barn 1	freestall	small heifers	542	542	1.370		12.5%	10%	1				15%	10%	0.83
3	Freestall Barn 2	freestall	small heifers	340	340	1.370		12.5%	10%					15%	10%	0.83
4	Freestall Barn 3	freestall	large heifers	362	362	1.370		12.5%	10%	1				15%		0.92
5	Freestall Barn 3	freestall	medium heifers	354	354	1.370		12.5%	10%	1				15%	10%	0.83
6	Freestall Barn 4	freestall	large heifers	900	900	1.370		12.5%	10%	1				15%		0.92

### Pre-Project Potential to Emit - Cow Housing

Pre-Project Potential to Emit - Cow Housing												
	Housing Name(s) or # (s)	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
1	Corral 1	medium heifers	1,632	3.67	4.43	9.67	16.4	5,989	19.8	7,226	43.3	15,788
2	Corral 2	small heifers	372	2.06	3.31	9.67	2.1	766	3.4	1,232	9.9	3,599
Pre-Project Total # of Cows			2,004				18.5	6,755	23.2	8,458	53.2	19,387

\*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows.

Pre-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
2,004	18.5	6,755	23.2	8,458	53.2	19,387

#### Calculations:

Annual PE 1 for each pollutant (lb/yr) = Controlled EF (lb/hd-yr) x # of cows (hd)

Daily PE1 for each pollutant (lb/day) = [Controlled EF (lb/hd-yr) x # of cows (hd)] ÷ 365 (day/yr)

### Post-Project Potential to Emit - Cow Housing

Post-Project Potential to Emit - Cow Housing												
	Housing Name(s) or # (s)	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
1	Shade Barn 1	calves	200	0.97	1.01	0.76	0.5	194	0.6	202	0.4	151
2	Shade Barn 2	calves	332	0.97	1.01	0.76	0.9	322	0.9	335	0.7	251
Post-Project # of Cows (non-expansion)			532				1.4	516	1.5	537	1.1	402

\*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows.

Post-Project Potential to Emit - Cow Housing: New Housing Units at an Expanding Dairy												
	Housing Name(s) or # (s)	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
1	Freestall Barn 1	dry cows	471	6.95	11.81	0.92	9.0	3,273	15.2	5,562	1.2	432
2	Freestall Barn 1	small heifers	542	2.06	3.31	0.83	3.1	1,117	4.9	1,795	1.2	447
3	Freestall Barn 2	small heifers	340	2.06	3.31	0.83	1.9	700	3.1	1,126	0.8	281
4	Freestall Barn 3	large heifers	362	5.41	6.12	0.92	5.4	1,958	6.1	2,215	0.9	332
5	Freestall Barn 3	medium heifers	354	3.67	4.43	0.83	3.6	1,299	4.3	1,568	0.8	292
6	Freestall Barn 4	large heifers	900	5.41	6.12	0.92	13.3	4,869	15.1	5,508	2.3	825
Total # of Cows From Expansion			2,969				36.3	13,216	48.7	17,774	7.2	2,609

\*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows.

Post-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
3,501	37.7	13,732	50.2	18,311	8.3	3,011

#### Calculations:

Annual PE 2 for each pollutant (lb/yr) = Controlled EF (lb/hd-yr) x # of cows (hd)

Daily PE2 for each pollutant (lb/day) = [Controlled EF (lb/hd-yr) x # of cows (hd)] ÷ 365 (day/yr)

## Increase in Emissions

SSIFE (lb/yr)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	0	0	0
Cow Housing	0	0	-16,376	0	6,977	9,853	0
Liquid Manure	0	0	0	0	1,538	5,293	0
Solid Manure	0	0	0	0	294	1,211	0
Feed Handling	0	0	0	0	9,586	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>-16,376</b>	<b>0</b>	<b>18,396</b>	<b>16,356</b>	<b>0</b>

Total Daily Change in Emissions (lb/day)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cow Housing	0.0	0.0	-44.9	0.0	19.2	27.0	0.0
Liquid Manure	0.0	0.0	0.0	0.0	4.2	14.5	0.0
Solid Manure	0.0	0.0	0.0	0.0	0.9	3.3	0.0
Feed Handling	0.0	0.0	0.0	0.0	26.3	0.0	0.0
<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>-44.9</b>	<b>0.0</b>	<b>50.6</b>	<b>44.8</b>	<b>0.0</b>

Total Annual Change in Non-Fugitive Emissions (Major Source Emissions) (lb/yr)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	0	0	0
Cow Housing	0	0	0	0	0	0	0
Liquid Manure	0	0	0	0	741	0	0
Solid Manure	0	0	0	0	0	0	0
Feed Handling	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>741</b>	<b>0</b>	<b>0</b>

## APPENDIX B: ON-SITE MOBILE SOURCE COMBUSTION EMISSION WORKSHEETS

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**Table 1. Truck Travel: Diesel Particulate Matter Increased Emissions**

Type of Vehicles	Source	Round Trip Distance (mi)	Emission Factor (g/mi)	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max 24-hr)
Milk Tankers		0.00	2.52	0	0.00E+00	0.00E+00
Commodity Delivery	CTT	0.05	2.52	104	2.79E-02	0.00E+00
Solid Manure	SRTT	0.44	2.52	100	2.43E-01	0.00E+00
Rendering Service		0.00	2.52	0	0.00E+00	0.00E+00

\*No expected increase  
 \*No 24-Hr Max increase  
 \*No 24-Hr Max increase  
 \*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Traveling 5 MPH.  
 Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 2. Truck Idling: Diesel Particulate Matter Increased Emissions**

Type of Vehicles	Source	Emission Factor (g/hr-vehicle)	Minutes Idling/Truck	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max 24-hr)
Milk Tankers		0.46	0	0	0.00E+00	0.00E+00
Commodity Delivery	CTI	0.46	15	104	2.61E-02	0.00E+00
Solid Manure	SRTI	0.46	15	100	2.51E-02	0.00E+00
Rendering Service		0.46	0	0	0.00E+00	0.00E+00

\*No expected increase  
 \*No 24-Hr Max increase  
 \*No 24-Hr Max increase  
 \*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Idling.  
 Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 3. Tractors: Diesel Particulate Matter Increased Emissions**

	Source (# Volume Sources)	HP	Load Factor	Hours/day	Days/Year	Emission Factor (g/hp-hr)	Emissions (lb/yr)	Emissions (lb/Max 24-hr)
Feed Loading		0	0.37	0	365		0.00E+00	0.00E+00
Bedding Delivery	BTD1-3	135	0.37	5	50	1.49E-02	4.11E-01	8.21E-03
Manure Scraping		250	0.37	0	0		0.00E+00	0.00E+00
Manure Loading	MLT	300	0.37	0	0		0.00E+00	0.00E+00
Feed Delivery	FTD1-2	340	0.37	1	365	1.49E-02	1.51E+00	4.14E-03

\*None on site  
 \*No increase is expected  
 \*No increase is expected.

Note1 : Emissions based on EPA's *Nonroad Compression-Ignition* Engines - Exhaust Emission Standards for the appropriate year and HP  
<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf>  
 Note 2: Increase in hours/day was provided by the project applicant

**Table 4. Truck Travel: NO Increased Emissions**

	Source	Round Trip Distance (mi)	Emission Factor (g/mi)	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max hr)	
Milk Tankers	0	0.00	41.23	0	0.00E+00	0.00E+00	*No expected increase
Commodity Delivery	CTT	0.05	41.23	104	4.56E-01	0.00E+00	*No 1-Hr Max increase
Solid Manure	SRTT	0.44	41.23	100	3.98E+00	0.00E+00	*No 1-Hr Max increase
Rendering Service	0	0.00	41.23	0	0.00E+00	0.00E+00	*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Traveling 5 MPH.

Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 5. Truck Idling: NOx Increased Emissions**

Type of Vehicles	Source	Emission Factor (g/hr-vehicle)	Minutes Idling/Truck	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max hr)	
Milk Tankers	0	24.52	0	0	0.00E+00	0.00E+00	*No expected increase
Commodity Delivery	CTI	24.52	15	104	1.41E+00	0.00E+00	*No 1-Hr Max increase
Solid Manure	SRTI	24.52	15	100	1.35E+00	0.00E+00	*No 1-Hr Max increase
Rendering Service	0	24.52	0	0	0.00E+00	0.00E+00	*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Idling.

Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 6. Tractors: NOx Increased Emissions**

	Source (# Volume Sources)	HP	Load Factor	Hours/day	Days/Year	Emission Factor (g/hp-hr)	Emissions (lb/yr)	Emissions (lb/Max hr)	
Feed Loading	0	0	0.37	0	365		0.000E+00	0.00E+00	*None on site
Bedding Delivery	BTD1-3	135	0.37	5	50	2.98E-01	8.21E+00	3.28E-02	
Manure Scraping	0	250	0.37	0	0		0.00E+00	0.00E+00	*No increase is expected
Manure Loading	MLT	300	0.37	0	0		0.00E+00	0.00E+00	*No increase is expected
Feed Delivery	FTD1-2	340	0.37	1	365	2.98E-01	3.02E+01	8.27E-02	

Note 1: Emissions based on EPA's *Nonroad Compression-Ignition* Engines - Exhaust Emission Standards for the appropriate year and HP

<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100OA05.pdf>

Note 2: Increase in hours/day was provided by the project applicant

Note 3: Load factors from CalEEMod's Appendix D Table 3.3 *OFFROAD Default Horsepower and Load Factors*

Note 4: Actual max hourly emissions will not increase but was calculated since new freestall barns are closer to the facility boundary.

**Table 7. Truck Travel: SOx Increased Emissions**

Type of Vehicles	Source	Round Trip Distance (mi)	Emission Factor (g/mi)	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max 24-hr)	Emissions (lb/Max 3-hr)	Emissions (lb/Max 1-hr)	
Milk Tankers	0	0.00	0.04	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*No expected increase
Commodity Delivery	CTT	0.05	0.04	104	4.01E-04	0.00E+00	0.00E+00	0.00E+00	*No 24-Hr, 3-Hr, or 1-Hr Max increase
Solid Manure	SRTT	0.44	0.04	100	3.50E-03	0.00E+00	0.00E+00	0.00E+00	*No 24-Hr, 3-Hr, or 1-Hr Max increase
Rendering Service	0	0.00	0.04	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Traveling 5 MPH.

Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 8. Truck Idling: SOx Increased Emissions**

Type of Vehicles	Source	Emission Factor (g/hr-vehicle)	Minutes Idling/Truck	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max 24-hr)	Emissions (lb/Max 3-hr)	Emissions (lb/Max 1-hr)	
Milk Tankers	0	0.02	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*No expected increase
Commodity Delivery	CTI	0.02	15	104	9.49E-04	0.00E+00	0.00E+00	0.00E+00	*No 24-Hr, 3-Hr, or 1-Hr Max increase
Solid Manure	SRTI	0.02	15	100	9.12E-04	0.00E+00	0.00E+00	0.00E+00	*No 24-Hr, 3-Hr, or 1-Hr Max increase
Rendering Service	0	0.02	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Idling.

Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 9. Tractors: SOx Increase Emissions**

	Source (# Volume Sources)	HP	Load Factor	Hours/day	Days/Year	Emission Factor (g/hp-hr)	Emissions (lb/Max 24-hr)	Emissions (lb/Max 3-hr)	Emissions (lb/Max 1-hr)
Feed Loading	0	0	0.37	0	365		0.00E+00	0.00E+00	0.00E+00
Bedding Delivery	BTD1-3	135	0.37	5	50	5.00E-03	1.38E-01	2.75E-03	5.51E-04
Manure Scraping	0	250	0.37	0	0		0.00E+00	0.00E+00	0.00E+00
Manure Loading	MLT	300	0.37	0	0		0.00E+00	0.00E+00	0.00E+00
Feed Delivery	FTD1-2	340	0.37	1	365	5.00E-03	5.06E-01	1.39E-03	1.39E-03

Note1 : Emissions based on CalEEmod's Appendix D, defaults for the appropriate year and HP

Note 2: Increase in hours/day was provided by the project applicant

Note 3: Load factors from CalEEmod's Appendix D Table 3.3 *OFFROAD Default Horsepower and Load Factors*

Note 4: Actual max hourly and 3-hour emissions will not increase but was calculated since the max hour will relocate closer to the facility boundary.

**Table 10. Truck Travel: CO Increased Emissions**

Type of Vehicles	Source	Round Trip Distance (mi)	Emission Factor (g/mi)	Increase in Trucks/Year	Emissions (lb/Max 8-yr)	Emissions (lb/Max hr)	
Milk Tankers	0	0.00	17.83	0	0.00E+00	0.00E+00	*No expected increase
Commodity Delivery	CTT	0.05	17.83	104	0.00E+00	0.00E+00	*No 8-Hr or 1-Hr Max increase
Solid Manure	SRTT	0.44	17.83	100	0.00E+00	0.00E+00	*No 8-Hr or 1-Hr Max increase
Rendering Service	0	0.00	17.83	0	0.00E+00	0.00E+00	*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Traveling 5 MPH.

Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 11. Truck Idling: CO Increased Emissions**

Type of Vehicles	Source	Emission Factor (g/hr-vehicle)	Minutes Idling/Truck	Increase in Trucks/Year	Emissions (lb/Max hr)	Emissions (lb/Max 8-hr)	
Milk Tankers	0	11.96	0	0	0.00E+00	0.00E+00	*No expected increase
Commodity Delivery	CTI	11.96	15	104	0.00E+00	0.00E+00	*No 8-Hr or 1-Hr Max increase
Solid Manure	SRTI	11.96	15	100	0.00E+00	0.00E+00	*No 8-Hr or 1-Hr Max increase
Rendering Service	0	11.96	0	0	0.00E+00	0.00E+00	*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Idling.

Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 12. Tractors: CO Increase Emissions**

	Source (# Volume Sources)	HP	Load Factor	Hours/day	Days/Year	Emission Factor (g/hp-hr)	Emissions (lb/yr)	Emissions (lb/Max hr)	Emissions (lb/Max 8-hr)
Feed Loading	0	0	0.37	0	365		0.00E+00	0.00E+00	0.00E+00
Bedding Delivery	BTD1-3	135	0.37	5	50	3.73E+00	1.03E+02	4.11E-01	2.05E+00
Manure Scraping	0	250	0.37	0	0		0.00E+00	0.00E+00	0.00E+00
Manure Loading	MLT	300	0.37	0	0		0.00E+00	0.00E+00	0.00E+00
Feed Delivery	FTD1-2	340	0.37	1	365	2.61E+00	2.64E+02	7.24E-01	7.24E-01

Note1 : Emissions based on EPA's *Nonroad Compression-Ignition* Engines - Exhaust Emission Standards for the appropriate year and HP  
<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100OA05.pdf>

Note 2: Increase in hours/day was provided by the project applicant

Note 3: Load factors from CalEEMod's Appendix D Table 3.3 *OFFROAD Default Horsepower and Load Factors*

## APPENDIX C: AAQA-PSD REPORT FOR NO<sub>2</sub>, CO, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> AND H<sub>2</sub>S

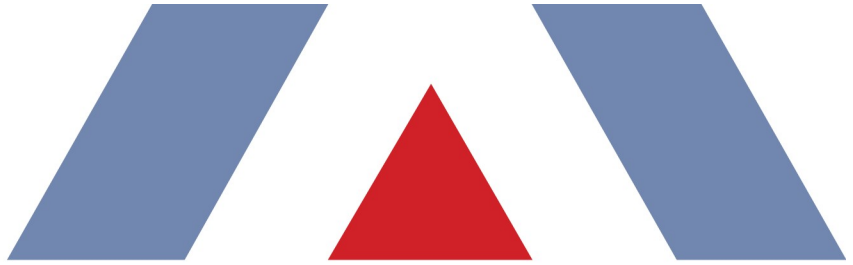
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**AAQA for Godinho HR Expansion**  
**All Values are in ug/m^3**

	NOx 1 Hour	NOx Annual	CO 1 Hour	CO 8 Hour	SOx 1 Hour	SOx 3 Hour	SOx 24 Hour	PM10 24 Hour	PM10 Annual	PM2.5 24 Hour	PM2.5 Annual	H2S 1 Hour
BTD1	2.43E+00	4.78E-03	3.04E+01	9.63E+00	4.09E-02	3.21E-02	2.05E-03	6.10E-03	2.39E-04	6.10E-03	2.39E-04	0.00E+00
BTD2	1.18E+00	1.14E-03	0.00E+00	0.00E+00	1.99E-02	1.29E-02	8.95E-04	2.67E-03	5.68E-05	2.67E-03	5.68E-05	0.00E+00
BTD3	6.88E-01	5.17E-04	8.58E+00	2.31E+00	1.16E-02	6.87E-03	4.52E-04	1.35E-03	2.58E-05	1.35E-03	2.58E-05	0.00E+00
CTI	0.00E+00	1.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-06	0.00E+00	2.10E-06	0.00E+00
CTT	0.00E+00	5.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.06E-06	0.00E+00	3.06E-06	0.00E+00
FSB1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.74E+00	9.88E-01	5.40E-01	1.13E-01	0.00E+00
FSB2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.51E+00	3.23E-01	2.87E-01	3.68E-02	0.00E+00
FSB3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E+00	4.48E-01	3.45E-01	5.11E-02	0.00E+00
FTD1	9.17E+00	2.63E-02	8.03E+01	5.09E+00	1.53E-01	4.03E-02	1.54E-03	4.60E-03	1.31E-03	4.60E-03	1.31E-03	0.00E+00
FTD2	4.47E+00	6.26E-03	3.91E+01	2.53E+00	7.49E-02	1.62E-02	6.73E-04	2.01E-03	3.13E-04	2.01E-03	3.13E-04	0.00E+00
SRTI	0.00E+00	1.71E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.17E-06	0.00E+00	3.17E-06	0.00E+00
SRTT	0.00E+00	8.55E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.22E-05	0.00E+00	5.22E-05	0.00E+00
Background	8.35E+01	1.42E+01	3.33E+03	2.59E+03	2.03E+01	1.83E+01	7.33E+00	1.43E+02	3.46E+01	8.82E+01	1.51E+01	0.00E+00
<b>Facility Totals</b>	<b>1.01E+02</b>	<b>1.42E+01</b>	<b>3.49E+03</b>	<b>2.61E+03</b>	<b>2.06E+01</b>	<b>1.84E+01</b>	<b>7.34E+00</b>	<b>1.53E+02</b>	<b>3.64E+01</b>	<b>8.94E+01</b>	<b>1.53E+01</b>	<b>0.00E+00</b>
<b>AAQS</b>	188.68	100	23000	10000	195	1300	105	50	20	35	12	42
	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	<b>Fail</b>	<b>Fail</b>	<b>Fail</b>	<b>Fail</b>	<b>Pass</b>
<b>District and EPA's Significance Level (ug/m^3)</b>												
	NOx 1 Hour	NOx Annual	CO 1 Hour	CO 8 Hour	SOx 1 Hour	SOx 3 Hour	SOx 24 Hour	PM10 24 Hour	PM10 Annual	PM2.5 24 Hour	PM2.5 Annual	
Totals w/o Background								10.30	1.76	1.19	0.20	
SIL	0	1	2000	500	0	25	5	10.4	2.08	2.5	0.63	
								<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	

**AAQA Emission (g/sec)**

<i>Device</i>	NOx 1 Hour	NOx Annual	CO 1 Hour	CO 8 Hour	SOx 1 Hour	SOx 3 Hour	SOx 24 Hour	PM10 24 Hour	PM10 Annual	PM2.5 24 Hour	PM2.5 Annual
BTD1	2.25E-03	6.46E-05	2.82E-02	1.76E-02	3.79E-05	3.79E-05	7.90E-06	2.36E-05	3.22E-06	2.36E-05	3.22E-06
BTD2	5.04E-04	1.44E-05	0.00E+00	0.00E+00	8.45E-06	8.45E-06	1.76E-06	5.25E-06	7.19E-07	5.25E-06	7.19E-07
BTD3	1.37E-03	3.93E-05	1.71E-02	1.07E-02	2.31E-05	2.31E-05	4.80E-06	1.44E-05	1.96E-06	1.44E-05	1.96E-06
CTI	0.00E+00	2.03E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.75E-07	0.00E+00	3.75E-07
CTT	0.00E+00	6.56E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.01E-07	0.00E+00	4.01E-07
FSB1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-02	1.26E-02	1.44E-03	1.44E-03
FSB2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.04E-03	4.04E-03	4.61E-04	4.61E-04
FSB3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.97E-03	8.97E-03	1.02E-03	1.02E-03
FTD1	8.52E-03	3.55E-04	7.46E-02	9.32E-03	1.42E-04	4.76E-05	5.95E-06	1.78E-05	1.77E-05	1.78E-05	1.77E-05
FTD2	1.90E-03	7.92E-05	1.66E-02	2.08E-03	3.19E-05	1.06E-05	1.33E-06	3.96E-06	3.96E-06	3.96E-06	3.96E-06
SRTI	0.00E+00	1.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.61E-07	0.00E+00	3.61E-07
SRTT	0.00E+00	5.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-06	0.00E+00	3.49E-06



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## **HEALTH RISK ASSESSMENT**

### **Godinho Heifer Ranch Expansion**

**13140 Johnson Road  
Los Banos, CA 93635  
Merced County**

Prepared By:

Matt Daniel – Senior Consultant

**INSIGHT ENVIRONMENTAL CONSULTANTS, INC.**

5500 Ming Avenue, Suite 140  
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Project 190505.0264



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## 1. EXECUTIVE SUMMARY

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This document contains the health risk assessment performed on behalf of Environmental Planning Partners, Inc. for an expansion of the existing Godinho Heifer Ranch operation in Merced County, California. As part of the development requirements for the project, an assessment is required of the potential risk to the population attributable to emissions of hazardous air pollutants from the proposed expansion.

Emissions of hazardous air pollutants attributable to proposed increases in construction activities, animal movement, manure management and on-site mobile sources were calculated using generally accepted emission factors and the California Emissions Estimator Model version 2016.3.2 (CalEEMod). Ambient air concentrations were 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 were used to calculate hazard indices (HIs), which are the ratio of expected exposure to acceptable exposure.

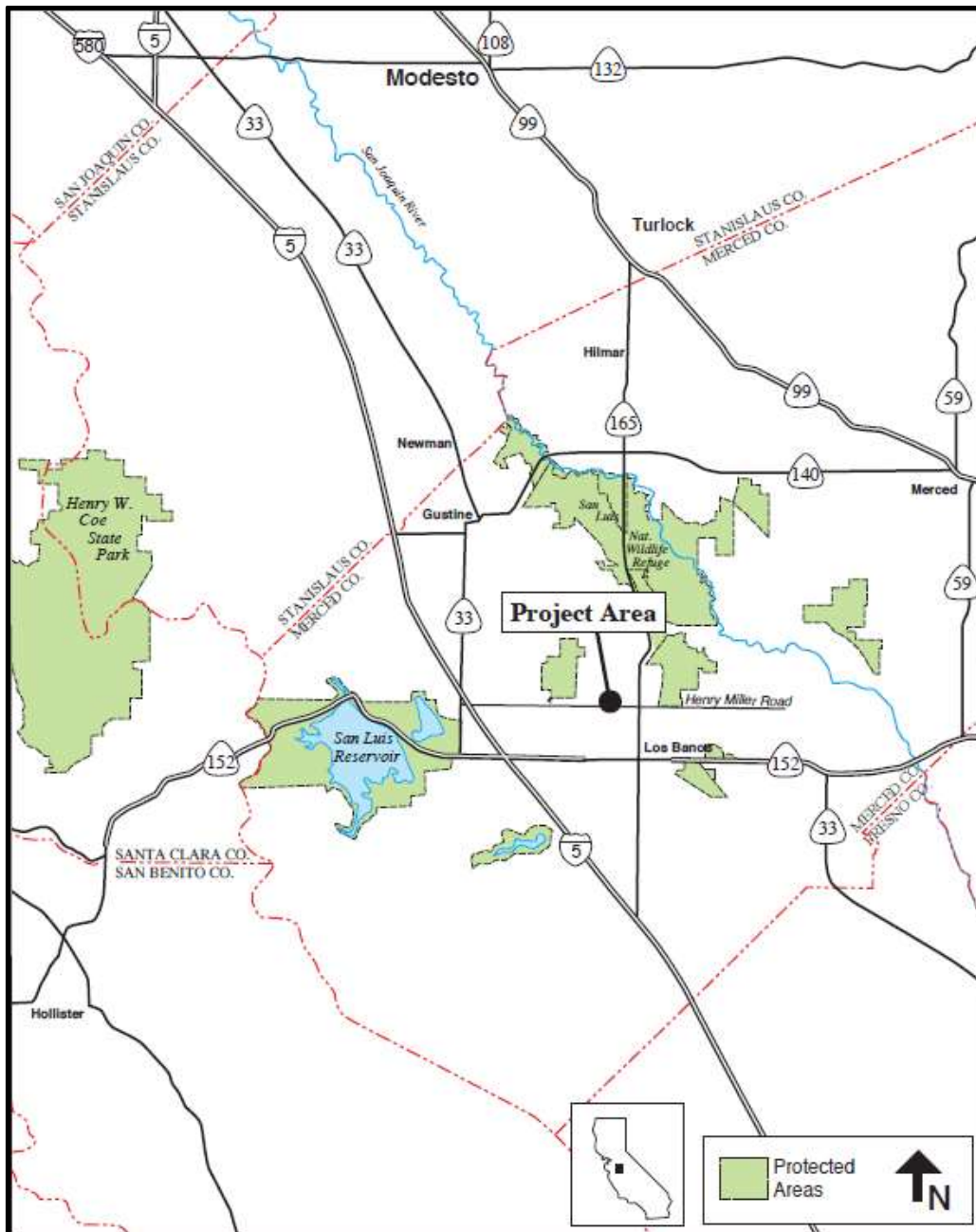
The San Joaquin Valley Air Pollution Control District (SJVAPCD) has set the level of significance for carcinogenic risk to twenty in one million ( $20 \times 10^{-6}$ ), which is understood as the possibility of causing twenty additional cancer cases in a population of one million people. The level of significance for acute and chronic non-cancer risk is a hazard index of 1.0. The maximum predicted cancer risk among the modeled receptors is 4.50 in one million, which is below the significance level of twenty in one million. The maximum predicted acute and chronic non-cancer hazard indices among the modeled receptors are 0.100 and 0.058, respectively, which is below the significance level for chronic and acute significance level.

In accordance with the SJVAPCD's *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015a) and policies (SJVAPCD 2015b; SJVAPCD 2015c) the potential health risk attributable to the proposed project is determined to be less than significant.

## 2. INTRODUCTION

This Health Risk Assessment (HRA) is provided as a service of Insight Environmental Consultants, Inc., a Trinity Consultants company, performed on behalf of Environmental Planning Partners, Inc. for an expansion of the existing Godinho Heifer Ranch operation in Merced County, California (**Figure 2-1**). As part of the development requirements for the property, an HRA is required.

Figure 2-1. Location Map



## 2.1. PROJECT DESCRIPTION

The existing heifer ranch is located at 13140 Johnson Road in Los Banos, California, which is in the County of Merced. The facility will not be located within 1,000 feet of a K-12 school.

The proposed structure construction would occur over two phases. Phase 1 construction would consist of 212,200 square feet of new animal structures which would take approximately 6 months of construction time within three to five years after application approval. Phase 2 construction would consist of a new 120,000 square foot animal shelter sometime between 5 and 10 years after application approval totaling four months of actual construction activities. All proposed construction would occur within the existing facility footprint.

After modification, the heifer ranch will house approximately 3,501 head of cattle. The existing and proposed herd configuration is provided in Table 2-1. The heifer ranch will continue to operate 24 hours per day and 365 days per year.

**Table 2-1. Herd Configuration – Existing and Proposed**

	<b>Current</b>	<b>Proposed</b>	<b>Increment</b>
Milk Cows	0	0	0
Dry Cows	0	471	471
Bred Heifers 15-24 mos.	0	1,262	1,262
Heifers 7-14 mos.	1,632	354	-1,278
Heifers 4-6 mos.	372	882	510
Calves 0-3 mos.	0	532	532
Bulls	0	0	0
<b>TOTAL</b>	<b>2,004</b>	<b>3,501</b>	<b>1,497</b>

The proposed structure construction would consist of four new freestall barns. The proposed expansion would include construction of 314,200 square feet of new buildings.

### 3. RISK ASSESSMENT METHODOLOGY

This section describes the methodology used to predict the potential health risk to the population attributable to emissions of hazardous air pollutants from the proposed expansion of the heifer ranch operation.

#### 3.1. HAZARD IDENTIFICATION

The basis for evaluating potential health risk is the identification of sources of hazardous air pollutants (HAPs). The proposed facility will include sources with the potential to emit HAPs. Pursuant to guidance by the San Joaquin Valley Air Pollution Control District<sup>1</sup> (SJVAPCD), emissions based on the current configuration of the heifer ranch are considered to be existing emissions. Based on this fact, the facility's existing emissions are not included in the emissions proposed for the subject project. Therefore, emissions from the facility modifications will be restricted to incremental emissions attributable to construction activities, animal movement, manure management, and land application of wastewater based on the proposed increase in the number of cattle (**Table 2-1**) and the additional on-site mobile sources required for the expansion.

Construction equipment sources include diesel-fueled dozers, loaders, backhoes, excavators, graders, cranes, forklifts, generator sets, concrete/industrial saws, and welders. CalEEMod default equipment listing for general light industrial usages were utilized. Default horsepower, daily operating hours, and load factors were also used. Operational mobile sources with increased emissions include a diesel-fueled feed delivery tractor, a bedding delivery tractor, manure removal trucks, and commodity delivery trucks. The increased herd size will require additional tractor use for feed delivery and bedding delivery. Additional truck trips will be required for manure removal trucks and commodity delivery trucks. There will also be emission increases from three of the new freestalls, lagoons, solid manure storage and land application areas associated with increased herd size. HRA emission sources HRA are listed in **Table 3-1**.

**Table 3-1. Sources of Potential Emissions**

Source ID	Description
CTI	Commodity Delivery Trucks Idling
CTT	Commodity Delivery Trucks Travel
SRTI	Manure Removal Trucks Idling
SRTT	Manure Removal Trucks Travel
FTD1-2	Feed Delivery
BTD1-3	Bedding Delivery
FSB1-4*	Freestall Barns
SHADE1-2*	Shade Barns
MLT*	Manure Loading Tractor
SMS	Solid Manure Storage
SLA1-2	Solids Land Application
LLA1-2	Liquid Land Application
LAGOON	Lagoons
CONST1	Phase 1 Construction Activities
CONST2	Phase 2 Construction Activities
*FSB2, SHADE1-2 and MLT were all modeled but had no increase in emissions.	

<sup>1</sup> Personal Communication with Leland Villalvazo, San Joaquin Valley Air Pollution Control District, June 15, 2007.

**Table 3-2** lists the toxic substances emitted from each of these activities and also presents the classification of these species as to their potential for producing carcinogenic and non-cancer acute or chronic health impacts, if any.

**Table 3-2. Chemicals of Potential Concern**

CAS	Pollutant	Source	Cancer	Non-Cancer	
				Acute	Chronic
9901	Diesel Exhaust, Particulate Matter	Tractors, Diesel Trucks	X		X
9960	Sulfates	Animal Movement		X	X
50000	Formaldehyde	Animal Movement	X	X	X
56235	Carbon tetrachloride	Animal Movement, Lagoons	X	X	X
67630	Isopropyl Alcohol	Animal Movement		X	X
67663	Chloroform	Animal Movement, Lagoons	X	X	X
71432	Benzene	Animal Movement, Lagoons	X	X	X
71556	1,1,1-trichloroethane	Lagoons		X	X
74873	Methyl Chloride	Animal Movement	X	X	X
75003	Ethyl Chloride	Animal Movement			X
75070	Acetaldehyde	Animal Movement	X		X
75150	Carbon disulfide	Animal Movement		X	X
75252	Tribromomethane *	Lagoons			
75694	Trichloromonofluoromethane *	Lagoons			
76131	1,1,2-Trichloro-1,2,2-trifluoroethane	Lagoons			X
78933	Methyl Ethyl Ketone (MEK)	Animal Movement, Lagoons		X	X
79005	1,1,2-Trichloroethane	Animal Movement	X		
79016	Trichloroethylene	Animal Movement, Lagoons	X		X
79345	1,1,2,2-Tetrachloroethane	Animal Movement	X		
91203	Naphthalene	Animal Movement	X		X
95501	1,2-Dichlorobenzene *	Animal Movement, Lagoons			
95636	1,2,4-Trichlorobenzene *	Lagoons			
96128	1,2-Dibromo-3-chloropropane	Animal Movement	X		X
96184	1,2,3-Trichloropropane *	Animal Movement			
98828	Cumene *	Animal Movement			
100414	Ethylbenzene	Animal Movement			X
100425	Styrene	Animal Movement, Lagoons		X	X
100447	Benzyl chloride	Animal Movement	X	X	X
106467	1,4-Dichlorobenzene	Animal Movement, Lagoons	X		X
106934	1,2-Dibromoethane (EDB)	Animal Movement	X		X
106990	1,3-Butadiene	Lagoons	X		X
107062	1,2-Dichloroethane (EDC)	Animal Movement	X		X
107131	Acrylonitrile	Animal Movement	X		X
108054	Vinyl acetate	Animal Movement, Lagoons			X
108101	Methyl Isobutyl Ketone *	Animal Movement, Lagoons			
108883	Toluene	Animal Movement, Lagoons		X	X

CAS	Pollutant	Source	Cancer	Non-Cancer	
				Acute	Chronic
108907	Chlorobenzene	Animal Movement			X
110543	Hexane	Animal Movement			X
110827	Cyclohexane *	Animal Movement, Lagoons			
115071	Propylene	Lagoons			X
120821	1,2,4-Trichlorobenzene *	Animal Movement			
123728	Butyraldehyde *	Animal Movement			
123911	1,4 Dioxane	Animal Movement	X	X	X
127184	Tetrachloroethene	Animal Movement	X	X	X
541731	1,3-Dichlorobenzene *	Animal Movement, Lagoons			
764410	t-1,4-Dichloro-2-butene *	Animal Movement			
1330207	Xylene Isomers	Animal Movement, Lagoons		X	X
4170303	Crotonaldehyde *	Animal Movement			
7429905	Aluminum *	Animal Movement			
7439921	Lead	Animal Movement	X		
7439965	Manganese	Animal Movement			X
7439976	Mercury	Animal Movement		X	X
7440020	Nickel	Animal Movement	X	X	X
7440360	Antimony *	Animal Movement			
7440382	Arsenic	Animal Movement	X	X	X
7440393	Barium *	Animal Movement			
7440439	Cadmium	Animal Movement	X		X
7440473	Chromium *	Animal Movement			
7440508	Copper	Animal Movement		X	X
7440622	Vanadium	Animal Movement	X		
7440666	Zinc	Animal Movement			X
7664417	Ammonia	Animal Movement, Lagoons Wastewater Application		X	X
7723140	Phosphorus *	Animal Movement			
7726956	Bromine	Animal Movement			X
7782492	Selenium	Animal Movement			X
7782505	Chlorine	Animal Movement		X	X
18540299	Hexavalent Chromium	Animal Movement	X	X	X

\*Health risk assessment values have not yet been assigned for this chemical.

## 3.2. EXPOSURE ASSESSMENT

### 3.2.1. Source Emissions and Characterization

Peak one-hour emission rates and annual-averaged emission rates were calculated for all pollutants for each modeled source. Emissions attribute to animal movement and manure management were estimated by the SJVAPCD using PM<sub>10</sub> emission factors and HAPs speciation spreadsheets. The incremental increase in emissions attributable to cattle were calculated by comparing the emissions from each source based on the number and type of cattle pre and post project. The project applicant provided pre and post cattle numbers. Emissions for tractors were calculated using the EPA's *Nonroad Compression-Ignition Engines - Exhaust Emission Standards* for

the appropriate engine horsepower (HP) and year and load factors for the appropriate engine horsepower from California Emissions Estimator Model (CalEEMod) Appendix D, Tables 3.3 and 3.4. Diesel truck running and idling emissions are based on EMFAC2017 emission factors specific to Merced County for vehicle category "T7 Ag." Diesel trucks were assumed to have 15 minutes of idling per visit.

The SJVAPCD's *H<sub>2</sub>S AERMOD Hourly Emission File Generator* states that H<sub>2</sub>S emissions 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 will be no increase in the surface area of the existing lagoons, there will be no increase in H<sub>2</sub>S emission associated with the proposed expansion.

The actual total construction activities of both Phase 1 and Phase 2 was estimated to be 10 months based on other expansion projects. Therefore, a 0.9-year exposure HRA was conducted and added to the operational HRA results. Construction emissions will be restricted to occur between the hours of 6am and 8pm.

The calculation worksheets and CalEEMod output files for the emissions are provided in **Appendix A**. Hourly and annual emissions for each source are also provided in the HARP output files, electronic copies of which are provided on a CD in **Appendix B**.

### 3.2.2. Dispersion Modeling

A 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 heifer ranch expansion. The construction activities, animal housing areas, lagoon, solid manure storage and land application areas were modeled as area sources. Unit emission rates for the area sources of 1 g/sec divided by the area of the source were input into AERMOD. The travel route for the feed and bedding delivery tractors, manure removal trucks, and commodity trucks were modeled as line sources, which represents a series of volume sources, with a unit emission rate of 1 g/sec. The manure loading tractor, manure removal truck idling, and commodity truck idling were modeled as point sources, with a unit emission rate of 1 g/sec. Modeled sources are identified in **Table 3-1**.

All of the AERMOD regulatory default parameters were employed. Rural dispersion parameters were used because the facility and surrounding land are considered "rural" under the Auer land use classification method. The AERMOD files are provided in electronic format on a CD in **Appendix B**.

#### 3.2.2.1. Meteorological Data

The SJVAPCD provided meteorological data for Merced County, California to be used for projects within Merced County. SJVAPCD-approved, AERMET processed meteorological datasets for calendar years 2013 through 2017<sup>2</sup> was input into AERMOD. This was the most recent available dataset available at the time the modeling runs were conducted.

#### 3.2.2.2. Receptors

Existing land uses in the area where the proposed heifer ranch will be located are predominantly agriculture. There are scattered rural residences in the general area of the project; most of which are associated with local agricultural operations. A total of 81 off-site receptors of residences, 1 on-site receptor, 99 potential agricultural workers were assessed during the preparation of this HRA. There is currently two other on-site residences, however, these residence is occupied by adult heifer ranch workers only. Therefore, these residences are

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<sup>2</sup> Provided via website, San Joaquin Valley Air Pollution Control District (SJVAPCD), [http://12.219.204.27/public/Modeling/Meteorological\\_Data/AERMET%20v18081\\_UStar/Merced\\_23257/](http://12.219.204.27/public/Modeling/Meteorological_Data/AERMET%20v18081_UStar/Merced_23257/)

exempt from being modeled.<sup>3</sup> Coordinates for the point of maximum impact (PMI) receptors are provided in **Table 2-3**.

### 3.2.3. HARP Post-Processing

Plot files generated by AERMOD were imported to the Air Dispersion Modeling and Risk Assessment Tool (ADMRT) program in the Hotspots Analysis and Reporting Program Version 2 (HARP 2) (CARB 2015). ADMRT post-processing was used to assess the potential for excess cancer risk and chronic non-cancer effects using the most recent health effects data from the California EPA Office of Environmental Health Hazard Assessment (OEHHA). ADMRT site parameters were set for mandatory minimum exposure pathways for carcinogenic risk. The deposition rate was set to 0.02 m/s. Risk reports were generated for carcinogenic risk, non-carcinogenic chronic risk and non-carcinogenic acute risk. Site parameters are included in the HARP output files.

## 3.3. RISK CHARACTERIZATION

For permitting and CEQA purposes, SJVAPCD has set the level of significance for carcinogenic risk at 20 in one million, which is understood as the possibility of causing twenty additional cancer cases in a population of one million people (SJVAPCD 2015b). The level of significance for chronic and acute non-cancer risk is a hazard index of one (SJVAPCD 2015c).

HARP 2 post-processing was used to assess the potential for the following: excess cancer risk, acute non-cancer effects, and chronic non-cancer effects. Total cancer risk was predicted for inhalation and non-inhalation pathways at each receptor. The hazard index is computed by endpoint as the sum of the hazard indices for all relevant pollutants, the highest of which is designated as the total hazard index.

The carcinogenic risk predicted at the potentially impacted receptors does not exceed the significance level of twenty in one million ( $20 \times 10^{-6}$ ). The health hazard index (HI) for chronic and acute non-cancer risk is below the significance level of 1.0 at all modeled receptors. The excess cancer risk, acute non-cancer HI, and chronic non-cancer HI for the maximum modeled receptor are provided in **Table 3-3**. The HARP2 output files for cancer, acute, and chronic risks are provided in electronic format on a CD in **Appendix B**.

As shown below in **Table 3-3**, the maximum predicted cancer risk is  $4.50\text{E-}06$ . Cancer risks are primarily attributable to emissions of diesel particulate matter (DPM) through the inhalation pathway. Carcinogenic risks are tabulated by pollutant in **Table 3-4**.

The maximum predicted acute non-cancer hazard index is 0.100. Acute risks are primarily attributable to emissions of ammonia, which affects the respiratory system and eyes. Acute risks are tabulated by pollutant in **Table 3-5**.

The maximum predicted chronic non-cancer hazard index is 0.058. Chronic risks, tabulated by pollutant in **Table 3-6**, are primarily attributable to emissions of arsenic and ammonia which affect the respiratory system.

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<sup>3</sup> Personal communication with Leland Villalvazo, SJVAPCD, November 1, 2012.

**Table 3-3. Risk Predicted By HARP**

	<b>Maximum Lifetime Excess Cancer Risk</b>	<b>Maximum Non-Cancer Chronic Hazard Index</b>	<b>Maximum Non-Cancer Acute Hazard Index</b>
<b>Construction</b>	2.37E-06	1.01E-02	0.00E+00
<b>Operational</b>	2.14E-06	4.82E-02	1.00E-01
<b>Total</b>	4.50E-06	5.84E-02	1.00E-01
<b>Receptor #, Name</b>	10, Off-Site Residence	94, Off-Site Worker	110, Off-Site Worker
<b>UTM Easting (m)</b>	689695.73	690218.40	690347.49
<b>UTM Northing (m)</b>	4108040.05	4107628.73	4107994.65

**Table 3-4. Risk by Pollutant – Maximum Cancer Risk at Receptor #10**

CHEM	INHAL	SOIL	DERM	MOTHER	WATER	FISH	CROP	BEEF	DAIRY	PIG	CHICK	EGG	TOTAL
DieselExhPM	2.61E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.61E-06
Naphthalene	4.25E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.25E-07
Acrylonitrile	3.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.14E-07
DBCP	3.08E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.08E-07
Arsenic	3.06E-08	1.65E-07	7.04E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E-07
EDB	1.16E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-07
Benzyl Chloride	1.15E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-07
TetraClEthane	9.36E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.36E-08
Perc	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.14E-08
Cr(VI)	5.67E-08	2.40E-09	3.42E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.92E-08
p-DiClBenzene	4.62E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.62E-08
1,4-Dioxane	4.29E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.29E-08
Benzene	3.22E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.22E-08
Acetaldehyde	2.35E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.35E-08
1,1,2TriClEthane	1.75E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-08
Formaldehyde	9.72E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.72E-09
CCl4	7.83E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.83E-09
EDC	7.69E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-09
Ethyl Benzene	3.85E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.85E-09
Lead	2.34E-10	2.04E-09	4.35E-11	2.24E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-09
Chloroform	2.21E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.21E-09
TCE	1.05E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-09
Nickel	1.01E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-09
SUM	4.33E-06	1.70E-07	7.12E-09	2.24E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.50E-06

**Table 3-5. Risk by Pollutant – Maximum Acute Noncancer Risk at Receptor #110**

CHEM	CV	CNS	IMMUN	KIDNEY	GILV	REPRO /DEVEL	RESP	SKIN	EYE	BONE /TEETH	ENDO	BLOOD	ODOR	GENERAL	MAX
NH3	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.47E-02	0.00E+0	9.47E-02	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	9.47E-02
SULFATES	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.29E-03	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.29E-03
Acetaldehyde	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-03	0.00E+0	1.26E-03	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.26E-03
Benzyl Chloride	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.99E-04	0.00E+0	8.99E-04	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	8.99E-04
MEK	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.46E-04	0.00E+0	2.46E-04	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.46E-04
Chloroform	0.00E+0	1.87E-04	0.00E+00	0.00E+00	0.00E+00	1.87E-04	1.87E-04	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.87E-04
1,4-Dioxane	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.42E-04	0.00E+0	1.42E-04	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.42E-04
Isopropyl Alcoh	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-04	0.00E+0	1.20E-04	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.20E-04
Perc	0.00E+0	5.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.00E-05	0.00E+0	5.00E-05	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	5.00E-05
Copper	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.99E-05	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.99E-05
Vanadium	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.78E-05	0.00E+0	3.78E-05	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.78E-05
Xylenes	0.00E+0	2.17E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.17E-05	0.00E+0	2.17E-05	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.17E-05
Toluene	0.00E+0	7.86E-06	0.00E+00	0.00E+00	0.00E+00	7.86E-06	7.86E-06	0.00E+0	7.86E-06	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	7.86E-06
Styrene	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.47E-06	7.47E-06	0.00E+0	7.47E-06	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	7.47E-06
Arsenic	3.02E-03	3.02E-03	0.00E+00	0.00E+00	0.00E+00	3.02E-03	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.02E-03
Mercury	0.00E+0	2.52E-04	0.00E+00	0.00E+00	0.00E+00	2.52E-04	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.52E-04
Nickel	0.00E+0	0.00E+00	1.32E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.32E-03
Benzene	0.00E+0	0.00E+00	3.06E-03	0.00E+00	0.00E+00	3.06E-03	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	3.06E-03	0.00E+00	0.00E+00	3.06E-03
CS2	0.00E+0	1.17E-04	0.00E+00	0.00E+00	0.00E+00	1.17E-04	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.17E-04
CCl4	0.00E+0	6.62E-06	0.00E+00	0.00E+00	6.62E-06	6.62E-06	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	6.62E-06
Formaldehyde	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+0	2.28E-03	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.28E-03
SUM	3.02E-03	3.67E-03	4.38E-03	0.00E+00	6.62E-06	6.66E-03	1.00E-01	0.00E+0	9.97E-02	0.00E+00	0.00E+0	3.06E-03	0.00E+00	0.00E+00	1.00E-01

**Table 3-6. Risk by Pollutant – Maximum Chronic Noncancer Risk at Receptor #94**

CHEM	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL	MAX
NH3	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	2.50E-02	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.50E-02
Arsenic	1.77E-02	1.77E-02	0.00E+0	0.00E+0	0.00E+00	1.77E-02	1.77E-02	1.77E-02	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.77E-02
Naphthalene	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	4.30E-03	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.30E-03
Acrylonitrile	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	4.36E-04	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.36E-04
Formaldehyde	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	3.17E-04	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.17E-04
Nickel	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	2.02E-06	2.92E-04	0.00E+00	0.00E+0	0.00E+0	0.00E+0	2.92E-04	0.00E+00	0.00E+00	2.92E-04
DieselExhPM	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	1.02E-02	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.02E-02
Acetaldehyde	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	7.90E-05	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	7.90E-05
Vinyl Acetate	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	3.33E-05	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.33E-05
Toluene	0.00E+00	1.98E-05	0.00E+0	0.00E+0	0.00E+00	1.98E-05	1.98E-05	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.98E-05
p-DiClBenzene	0.00E+00	1.42E-05	0.00E+0	1.42E-05	1.42E-05	0.00E+0	1.42E-05	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.42E-05
Xylenes	0.00E+00	1.37E-05	0.00E+0	0.00E+0	0.00E+00	0.00E+0	1.37E-05	0.00E+00	1.37E-05	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.37E-05
Cr(VI)	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	2.04E-06	0.00E+00	0.00E+0	0.00E+0	0.00E+0	1.11E-07	0.00E+00	0.00E+00	2.04E-06
Manganese	0.00E+00	4.92E-03	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.92E-03
Mercury	0.00E+00	1.64E-04	0.00E+0	1.64E-04	0.00E+00	1.64E-04	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.64E-04
Selenium	6.92E-07	6.92E-07	0.00E+0	0.00E+0	6.92E-07	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	6.92E-07
1,4-Dioxane	3.14E-06	0.00E+0	0.00E+0	3.14E-06	3.14E-06	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.14E-06
Benzene	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	5.38E-04	0.00E+00	0.00E+00	5.38E-04
CS2	0.00E+00	1.96E-05	0.00E+0	0.00E+0	0.00E+00	1.96E-05	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.96E-05
CCl4	0.00E+00	4.97E-06	0.00E+0	0.00E+0	4.97E-06	4.97E-06	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.97E-06
Chlorobenzn	0.00E+00	0.00E+0	0.00E+0	3.35E-06	3.35E-06	3.35E-06	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.35E-06
Chloroform	0.00E+00	0.00E+0	0.00E+0	1.48E-06	1.48E-06	1.48E-06	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.48E-06
Ethyl Chloride	0.00E+00	0.00E+0	0.00E+0	0.00E+0	5.56E-08	5.56E-08	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	5.56E-08
Ethyl Benzene	0.00E+00	0.00E+0	0.00E+0	1.51E-06	1.51E-06	1.51E-06	0.00E+0	0.00E+00	0.00E+0	0.00E+0	1.51E-06	0.00E+00	0.00E+00	0.00E+00	1.51E-06
EDB	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	4.62E-03	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.62E-03
EDC	0.00E+00	0.00E+0	0.00E+0	0.00E+0	2.38E-06	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.38E-06
Hexane	0.00E+00	5.07E-07	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	5.07E-07
Isopropyl Alcoh	0.00E+00	0.00E+0	0.00E+0	9.82E-07	0.00E+00	9.82E-07	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	9.82E-07
Perc	0.00E+00	0.00E+0	0.00E+0	9.90E-04	9.90E-04	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	9.90E-04
Styrene	0.00E+00	4.70E-06	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.70E-06
TCE	0.00E+00	3.46E-06	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+00	3.46E-06	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.46E-06
SUM	1.77E-02	2.28E-02	0.00E+0	1.18E-03	1.02E-03	2.25E-02	5.84E-02	1.77E-02	1.71E-05	0.00E+0	1.51E-06	8.29E-04	0.00E+00	0.00E+00	5.84E-02

## 4. CONCLUSIONS

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In accordance with the *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015a) and San Joaquin Valley Air Pollution Control District policies (SJVAPCD 2015b; SJVAPCD 2016c), the unmitigated potential health risk attributable to the Godinho Heifer Ranch expansion for chronic and acute carcinogenic and non-carcinogenic risk is determined to be less than significant based on the following conclusion:

- Potential chronic carcinogenic risk from the proposed facility is *below* the significance level of twenty in one million at each of the modeled receptors;
- The hazard index for the potential chronic non-cancer risk from the proposed facility is *below* the significance level of 1.0 at each of the modeled receptors.
- The hazard index for the potential acute non-cancer risk from the proposed facility is *below* the significance level of 1.0 at each of the modeled receptors.

## 5. REFERENCES

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## APPENDIX A: EMISSION ESTIMATION WORKSHEETS

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**Table 1. Truck Travel: Diesel Particulate Matter Increased Emissions**

Type of Vehicles	Source	Round Trip Distance (mi)	Emission Factor (g/mi)	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max 24-hr)
Milk Tankers		0.00	2.52	0	0.00E+00	0.00E+00
Commodity Delivery	CTT	0.05	2.52	104	2.79E-02	0.00E+00
Solid Manure	SRTT	0.44	2.52	100	2.43E-01	0.00E+00
Rendering Service		0.00	2.52	0	0.00E+00	0.00E+00

\*No expected increase  
 \*No 24-Hr Max increase  
 \*No 24-Hr Max increase  
 \*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Traveling 5 MPH.  
 Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 2. Truck Idling: Diesel Particulate Matter Increased Emissions**

Type of Vehicles	Source	Emission Factor (g/hr-vehicle)	Minutes Idling/Truck	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max 24-hr)
Milk Tankers		0.46	0	0	0.00E+00	0.00E+00
Commodity Delivery	CTI	0.46	15	104	2.61E-02	0.00E+00
Solid Manure	SRTI	0.46	15	100	2.51E-02	0.00E+00
Rendering Service		0.46	0	0	0.00E+00	0.00E+00

\*No expected increase  
 \*No 24-Hr Max increase  
 \*No 24-Hr Max increase  
 \*No expected increase

Note 1: Running emission factors for vehicle category "T7 Ag" were obtained from the EMFAC2017 Web Database for Merced County (2019) with an Aggregate Fleet Mix Idling.  
 Note 2: Increases in trucks/yr is from the Initial Study, page 18

**Table 3. Tractors: Diesel Particulate Matter Increased Emissions**

	Source (# Volume Sources)	HP	Load Factor	Hours/day	Days/Year	Emission Factor (g/hp-hr)	Emissions (lb/yr)	Emissions (lb/Max 24-hr)
Feed Loading		0	0.37	0	365		0.00E+00	0.00E+00
Bedding Delivery	BTD1-3	135	0.37	5	50	1.49E-02	4.11E-01	8.21E-03
Manure Scraping		250	0.37	0	0		0.00E+00	0.00E+00
Manure Loading	MLT	300	0.37	0	0		0.00E+00	0.00E+00
Feed Delivery	FTD1-2	340	0.37	1	365	1.49E-02	1.51E+00	4.14E-03

\*None on site  
 \*No increase is expected  
 \*No increase is expected.

Note1 : Emissions based on EPA's *Nonroad Compression-Ignition* Engines - Exhaust Emission Standards for the appropriate year and HP  
<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf>  
 Note 2: Increase in hours/day was provided by the project applicant

## Pre-Project Facility Information

- Does this facility house Holstein or Jersey cows?   
Most facilities house Holstein cows unless explicitly stated on the PTO or application.
- Does the facility have an anaerobic treatment lagoon?
- Does the facility land apply liquid manure?   
Answering "yes" assumes worst case.
- Does the facility land apply solid manure?   
Answering "yes" assumes worst case.
- Is any scraped manure sent to a lagoon/storage pond?   
Answering "yes" assumes worst case.

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows					0		
Dry Cows					0		
Support Stock (Heifers, Calves, and Bulls)					0		
Large Heifers					0		
Medium Heifers				1,632	1,632		
Small Heifers				372	372		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves							0

Total Herd Summary	
Total Milk Cows	0
Total Mature Cows	0
Support Stock (Heifers, Calves, and Bulls)	2,004
Total Calves	0
Total Dairy Head	2,004

Pre-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

## Post-Project Facility Information

- Does this facility house Holstein or Jersey cows?   
Most facilities house Holstein cows unless explicitly stated on the PTO or application.
- Does the facility have an anaerobic treatment lagoon?
- Does the facility land apply liquid manure?   
Answering "yes" assumes worst case.
- Does the facility land apply solid manure?   
Answering "yes" assumes worst case.
- Is any scraped manure sent to a lagoon/storage pond?   
Answering "yes" assumes worst case.
- Does this project result in an increase or relocation of uncovered surface area for any lagoon/storage pond?

Post-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows					0		
Dry Cows		471			471		
Support Stock (Heifers, Calves, and Bulls)					0		
Large Heifers		1,262			1,262		
Medium Heifers		354			354		
Small Heifers		882			882		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves						532	532

Total Herd Summary	
Total Milk Cows	0
Total Mature Cows	471
Support Stock (Heifers, Calves, and Bulls)	2,498
Total Calves	532
Total Dairy Head	3,501

Post-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

Control Measure	PM10 Control Efficiency
Shaded corrals (milk and dry cows)	16.7%
Shaded corrals (heifers and bulls)	8.3%
Downwind shelterbelts	12.5%
Upwind shelterbelts	10%
Freestall with no exercise pens and non-manure based bedding	90%
Freestall with no exercise pens and manure based bedding	80%
Fibrous layer in dusty areas (i.e. hay, etc.)	10%
Bi-weekly corral/exercise pen scraping and/or manure removal using a pull type manure harvesting equipment in morning hours when moisture in air except during periods of rainy weather	15%
Sprinkling of open corrals/exercise pens	15%
Feeding young stock (heifers and calves) near dusk	10%

Pre-Project PM10 Mitigation Measures														
Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of <u>Each</u> Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
Corral 1	open corral	medium heifers	1,632	1,632		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Corral 2	open corral	small heifers	372	372		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pre-Project Total # of Cows			2,004			0								

[illegible]

## Post-Project PM10 Mitigation Measures

Post-Project PM10 Mitigation Measures															
	Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
1	Shade Barn 1	open corral	calves	200	200		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	Shade Barn 2	open corral	calves	332	332		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Post-Project PM10 Mitigation Measures for New Housing Units at an Expanding Dairy															
	Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
1	Freestall Barn 1	freestall	dry cows	471	471		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Freestall Barn 1	freestall	small heifers	542	542		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	Freestall Barn 2	freestall	small heifers	340	340		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	Freestall Barn 3	freestall	large heifers	362	362		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	Freestall Barn 3	freestall	medium heifers	354	354		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	Freestall Barn 4	freestall	large heifers	900	900		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Post-Project Total # of Cows				3,501	(The post-project total includes dairy cows already on-site and new cows from the expansion.)										

Post-Project PM10 Control Efficiencies and Emission Factors																
	Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	Uncontrolled EF (lb/hd-yr)	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)
1	Shade Barn 1	open corral	calves	200	200	1.370	8.3%	12.5%	10%					15%	10%	0.76
2	Shade Barn 2	open corral	calves	332	332	1.370	8.3%	12.5%	10%					15%	10%	0.76
Post-Project PM10 Control Efficiencies and Emission Factors for New Housing Emissions Units																
	Housing Name(s) or #(s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	Uncontrolled EF (lb/hd-yr)	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)
1	Freestall Barn 1	freestall	dry cows	471	471	1.370		12.5%	10%	1				15%		0.92
2	Freestall Barn 1	freestall	small heifers	542	542	1.370		12.5%	10%	1				15%	10%	0.83
3	Freestall Barn 2	freestall	small heifers	340	340	1.370		12.5%	10%					15%	10%	0.83
4	Freestall Barn 3	freestall	large heifers	362	362	1.370		12.5%	10%	1				15%		0.92
5	Freestall Barn 3	freestall	medium heifers	354	354	1.370		12.5%	10%	1				15%	10%	0.83
6	Freestall Barn 4	freestall	large heifers	900	900	1.370		12.5%	10%	1				15%		0.92

### Pre-Project Potential to Emit - Cow Housing

Pre-Project Potential to Emit - Cow Housing												
	Housing Name(s) or # (s)	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
1	Corral 1	medium heifers	1,632	3.67	4.43	9.67	16.4	5,989	19.8	7,226	43.3	15,788
2	Corral 2	small heifers	372	2.06	3.31	9.67	2.1	766	3.4	1,232	9.9	3,599
Pre-Project Total # of Cows			2,004				18.5	6,755	23.2	8,458	53.2	19,387

\*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows.

Pre-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
2,004	18.5	6,755	23.2	8,458	53.2	19,387

#### Calculations:

Annual PE 1 for each pollutant (lb/yr) = Controlled EF (lb/hd-yr) x # of cows (hd)

Daily PE1 for each pollutant (lb/day) = [Controlled EF (lb/hd-yr) x # of cows (hd)] ÷ 365 (day/yr)

### Post-Project Potential to Emit - Cow Housing

Post-Project Potential to Emit - Cow Housing												
	Housing Name(s) or # (s)	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
1	Shade Barn 1	calves	200	0.97	1.01	0.76	0.5	194	0.6	202	0.4	151
2	Shade Barn 2	calves	332	0.97	1.01	0.76	0.9	322	0.9	335	0.7	251
Post-Project # of Cows (non-expansion)			532				1.4	516	1.5	537	1.1	402

\*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows.

Post-Project Potential to Emit - Cow Housing: New Housing Units at an Expanding Dairy												
	Housing Name(s) or # (s)	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
1	Freestall Barn 1	dry cows	471	6.95	11.81	0.92	9.0	3,273	15.2	5,562	1.2	432
2	Freestall Barn 1	small heifers	542	2.06	3.31	0.83	3.1	1,117	4.9	1,795	1.2	447
3	Freestall Barn 2	small heifers	340	2.06	3.31	0.83	1.9	700	3.1	1,126	0.8	281
4	Freestall Barn 3	large heifers	362	5.41	6.12	0.92	5.4	1,958	6.1	2,215	0.9	332
5	Freestall Barn 3	medium heifers	354	3.67	4.43	0.83	3.6	1,299	4.3	1,568	0.8	292
6	Freestall Barn 4	large heifers	900	5.41	6.12	0.92	13.3	4,869	15.1	5,508	2.3	825
Total # of Cows From Expansion			2,969				36.3	13,216	48.7	17,774	7.2	2,609

\*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows.

Post-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
3,501	37.7	13,732	50.2	18,311	8.3	3,011

#### Calculations:

Annual PE 2 for each pollutant (lb/yr) = Controlled EF (lb/hd-yr) x # of cows (hd)

Daily PE2 for each pollutant (lb/day) = [Controlled EF (lb/hd-yr) x # of cows (hd)] ÷ 365 (day/yr)

## Increase in Emissions

SSiPE (lb/yr)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	0	0	0
Cow Housing	0	0	-16,376	0	6,977	9,853	0
Liquid Manure	0	0	0	0	1,538	5,293	0
Solid Manure	0	0	0	0	294	1,211	0
Feed Handling	0	0	0	0	9,586	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>-16,376</b>	<b>0</b>	<b>18,396</b>	<b>16,356</b>	<b>0</b>

Total Daily Change in Emissions (lb/day)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cow Housing	0.0	0.0	-44.9	0.0	19.2	27.0	0.0
Liquid Manure	0.0	0.0	0.0	0.0	4.2	14.5	0.0
Solid Manure	0.0	0.0	0.0	0.0	0.9	3.3	0.0
Feed Handling	0.0	0.0	0.0	0.0	26.3	0.0	0.0
<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>-44.9</b>	<b>0.0</b>	<b>50.6</b>	<b>44.8</b>	<b>0.0</b>

Total Annual Change in Non-Fugitive Emissions (Major Source Emissions) (lb/yr)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	0	0	0
Cow Housing	0	0	0	0	0	0	0
Liquid Manure	0	0	0	0	741	0	0
Solid Manure	0	0	0	0	0	0	0
Feed Handling	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>741</b>	<b>0</b>	<b>0</b>

# Name

# Cow Housing Summary

## Applicability

Use this spreadsheet to enter data from the Engineer's Dairy Calculator. Entries here will be linked to other worksheets. After completion, proceed to RMR worksheet for further entries.

Author or updater

Matthew Cegielski

Last Update

September 24, 2018

Facility:  
ID#:

Goninho Heifer Ranch

0

Not Set

Project #:

\*Note: Pre-Project Corrals 1 is the same location as Post-Project Shade Barn 1 and Freestall Barn 4. Emissions from Pre-Project Corrals 1 were greater than the combined totals of Post-Project Shade Barn 1 and Freestall Barn 4. Therefore, emissions have been set to zero.

\*\*Note: Pre-Project Corrals 2 is the same location as Post-Project Shade Barn 2. Emissions from Pre-Project Corrals 2 were greater than Post-Project Shade Barn 2 a. Therefore, emissions have been set to zero.

## Potential to Emit - Cow Housing

Housing Name(s) or #(s)	Type of Cow	# of Cows	VOC (lb/hr)	VOC (lb/yr)	NH <sub>3</sub> (lb/hr)	NH <sub>3</sub> (lb/yr)	PM <sub>10</sub> (lb/hr)	PM <sub>10</sub> (lb/yr)
Shade Barn #1*	Calves	200	0.0000	0	0.0000	0	0.0000	0
Shade Barn #2**	Calves	332	0.0000	0	0.0000	0	0.0000	0
Freestall Barn #1	Dry Cows/Support Stock	1013	0.5042	4,390	0.8375	7,357	0.1000	879
Freestall Barn #2	Support Stock	340	0.0792	700	0.1292	1,126	0.0333	281
Freestall Barn #3	Support Stock	716	0.3750	3,257	0.4333	3,783	0.0708	624
Freestall Barn #4*	Support Stock	900	0.0000	0	0.0000	0	0.0000	0

Copy and paste values from the corresponding table in the Engineer Dairy Calculator's RMR Summary worksheet. Paste values only with matched destination formatting. Ensure the same names are lined up by row number. Zero and null entries will be highlighted in red after entry.

### SSIPE RMR Summary

	PM10 lb/hr	PM10 lb/yr	VOC lb/hr	VOC lb/yr	NH3 lb/hr	NH3 lb/yr	H2S lb/yr
Milking Parlor	-	-	-	-	-	-	-
Cow Housing	-2	-16,376	1	6,977	1.125	9,853	-
Liquid Manure	-	-	0	1,538	0.604	5,293	-
Solid Manure	-	-	0	294	0.138	1,211	-
Feed Handling	-	-	1	9,586	-	-	-
Lagoon/Storage Pond	-	-	0	767	0.300	2,628	0
Land Application (Liquid)	-	-	0	803	0.304	2,665	-
Land Application (Solid)	-	-	0	146	0.075	657	-
Solid Manure Storage	-	-	0	110	0.063	548	-

### SSIPE Total Herd Summary

Change in Milk Cows	0
Change in Dairy Head	1,497
Change in Dairy Head (Flushed)	1,497

PM <sub>10</sub> based Agricultural Emissions from Operations generating Dust from Livestock														
Use this spreadsheet when the emissions are from a Feedlot Soil sources or Cow Housing and the PM <sub>10</sub> rates are known (e.g. Dairy operations). Ammonia and PM <sub>10</sub> Emission rates linked to Cow Housing worksheet. No entries required on this worksheet. Zero and null entries will be highlighted in red after entry.														
Author or updater	Matthew Cegielski													
Last Update	September 24, 2018													
Facility:	Goninho Heifer Ranch													
ID#:	0													
Project #:	0													
Formula			Shade Barn #1*		Shade Barn #2**		Freestall Barn #1		Freestall Barn #2		Freestall Barn #3		Freestall Barn #4*	
Emission are calculated by the multiplication of the PM <sub>10</sub> Rates and the Emission Factors.														
			lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
PM <sub>10</sub> Emissions Rates			0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-01	8.79E+02	3.33E-02	2.81E+02	7.08E-02	6.24E+02	0.00E+00	0.00E+00
Substances	CAS#	Dust* lb/lb PM <sub>10</sub>	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR
Aluminum	7429905	4.66E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.66E-03	4.10E+01	1.55E-03	1.31E+01	3.30E-03	2.91E+01	0.00E+00	0.00E+00
Antimony	7440360	1.90E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-06	1.67E-02	6.33E-07	5.34E-03	1.35E-06	1.19E-02	0.00E+00	0.00E+00
Arsenic	7440382	1.60E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E-06	1.41E-02	5.33E-07	4.50E-03	1.13E-06	9.98E-03	0.00E+00	0.00E+00
Barium	7440393	4.69E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.69E-05	4.12E-01	1.56E-05	1.32E-01	3.32E-05	2.93E-01	0.00E+00	0.00E+00
Bromine	7726956	4.40E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-06	3.87E-02	1.47E-06	1.24E-02	3.12E-06	2.75E-02	0.00E+00	0.00E+00
Chromium	7440473	1.40E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.40E-06	1.23E-02	4.67E-07	3.93E-03	9.92E-07	8.74E-03	0.00E+00	0.00E+00
Copper	7440508	1.32E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-05	1.16E-01	4.40E-06	3.71E-02	9.35E-06	8.24E-02	0.00E+00	0.00E+00
Hexavalent Chromium**	18540299	7.00E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.00E-08	6.15E-04	2.33E-08	1.97E-04	4.96E-08	4.37E-04	0.00E+00	0.00E+00
Lead	7439921	3.50E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.50E-06	3.08E-02	1.17E-06	9.84E-03	2.48E-06	2.18E-02	0.00E+00	0.00E+00
Manganese	7439965	7.59E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.59E-05	6.67E-01	2.53E-05	2.13E-01	5.38E-05	4.74E-01	0.00E+00	0.00E+00
Mercury	7439976	4.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-07	3.52E-03	1.33E-07	1.12E-03	2.83E-07	2.50E-03	0.00E+00	0.00E+00
Nickel	7440020	7.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.00E-07	6.15E-03	2.33E-07	1.97E-03	4.96E-07	4.37E-03	0.00E+00	0.00E+00
Phosphorus	7723140	4.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.01E-03	3.53E+01	1.34E-03	1.13E+01	2.84E-03	2.50E+01	0.00E+00	0.00E+00
Selenium	7782492	1.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-07	8.79E-04	3.33E-08	2.81E-04	7.08E-08	6.24E-04	0.00E+00	0.00E+00
Sulfates	9960	7.28E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.28E-04	6.40E+00	2.43E-04	2.05E+00	5.16E-04	4.54E+00	0.00E+00	0.00E+00
Vanadium	7440622	3.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-06	2.64E-02	1.00E-06	8.43E-03	2.13E-06	1.87E-02	0.00E+00	0.00E+00
Zinc	7440666	3.42E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-05	3.01E-01	1.14E-05	9.61E-02	2.42E-05	2.13E-01	0.00E+00	0.00E+00
Ammonia	7664417		0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.38E-01	7.36E+03	1.29E-01	1.13E+03	4.33E-01	3.78E+03	0.00E+00	0.00E+00

Agricultural Miscellaneous Emissions from Dairy Operations (Cow Housing)														
Use this spreadsheet to characterize the miscellaneous emissions from Dairy sources when VOC rates are known. VOC emission rates linked to Cow Housing worksheet. No entries required on this worksheet. Zero and null entries will be highlighted in red after entry.														
Author or updater	Matthew Cegielski													
Last Update	September 24, 2018													
Facility:	Goninho Heifer Ranch													
ID#:	0													
Project #:	0													
Formula			Shade Barn #1*		Shade Barn #2**		Freestall Barn #1		Freestall Barn #2		Freestall Barn #3		Freestall Barn #4*	
Emissions are calculated by the multiplication of the VOC Rates, and Emission Factors.			lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
VOC Emission Rates			0.00E+00	0.0	0.00E+00	0.0	5.04E-01	4,390.0	7.92E-02	700.0	3.75E-01	3,257.0	0.00E+00	0.0
Substances	CAS#	Volatiles (lb/lb VOC)*	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR
1,1,2,2-Tetrachloroethane	79345	8.73E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-06	3.83E-02	6.91E-07	6.11E-03	3.27E-06	2.84E-02	0.00E+00	0.00E+00
1,1,2-Trichloroethane	79005	2.26E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-04	9.92E-01	1.79E-05	1.58E-01	8.48E-05	7.36E-01	0.00E+00	0.00E+00
1,2,3-Trichloropropane	96184	2.76E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-04	1.21E+00	2.19E-05	1.93E-01	1.04E-04	8.99E-01	0.00E+00	0.00E+00
1,2,4-Trichlorobenzene	120821	7.79E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.93E-04	3.42E+00	6.17E-05	5.45E-01	2.92E-04	2.54E+00	0.00E+00	0.00E+00
1,2-Dibromo-3-chloropropane	96128	4.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.49E-05	2.17E-01	3.91E-06	3.46E-02	1.85E-05	1.61E-01	0.00E+00	0.00E+00
1,2-Dichlorobenzene	95501	5.48E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.76E-04	2.41E+00	4.34E-05	3.84E-01	2.06E-04	1.78E+00	0.00E+00	0.00E+00
1,3-Dichlorobenzene	541731	4.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-04	2.15E+00	3.88E-05	3.43E-01	1.84E-04	1.60E+00	0.00E+00	0.00E+00
1,4 Dioxane	123911	1.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.11E-04	6.19E+00	1.12E-04	9.87E-01	5.29E-04	4.59E+00	0.00E+00	0.00E+00
1,4-Dichlorobenzene	106467	5.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.62E-04	2.28E+00	4.11E-05	3.63E-01	1.95E-04	1.69E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	2.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-03	1.06E+01	1.91E-04	1.69E+00	9.04E-04	7.85E+00	0.00E+00	0.00E+00
Acrylonitrile	107131	2.43E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-04	1.07E+00	1.92E-05	1.70E-01	9.11E-05	7.91E-01	0.00E+00	0.00E+00
Benzene	71432	3.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-04	1.40E+00	2.53E-05	2.23E-01	1.20E-04	1.04E+00	0.00E+00	0.00E+00
Benzyl chloride	100447	2.89E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.46E-04	1.27E+00	2.29E-05	2.02E-01	1.08E-04	9.41E-01	0.00E+00	0.00E+00
Butyraldehyde	123728	1.14E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.75E-05	5.00E-01	9.03E-06	7.98E-02	4.28E-05	3.71E-01	0.00E+00	0.00E+00
Carbon Disulfide	75150	2.49E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-03	1.09E+01	1.97E-04	1.74E+00	9.34E-04	8.11E+00	0.00E+00	0.00E+00
Carbon tetrachloride	56235	5.87E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-05	2.58E-01	4.65E-06	4.11E-02	2.20E-05	1.91E-01	0.00E+00	0.00E+00
Chlorobenzene	108907	2.72E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-04	1.19E+00	2.15E-05	1.90E-01	1.02E-04	8.86E-01	0.00E+00	0.00E+00
Chloroform	67663	1.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.60E-05	5.75E-01	1.04E-05	9.17E-02	4.91E-05	4.27E-01	0.00E+00	0.00E+00
Chloromethane	74873	7.93E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-04	3.48E+00	6.28E-05	5.55E-01	2.97E-04	2.58E+00	0.00E+00	0.00E+00
Crotonaldehyde	4170303	1.41E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.11E-05	6.19E-01	1.12E-05	9.87E-02	5.29E-05	4.59E-01	0.00E+00	0.00E+00
Cyclohexane	110827	6.83E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.44E-03	3.00E+01	5.41E-04	4.78E+00	2.56E-03	2.22E+01	0.00E+00	0.00E+00
Ethyl Chloride	75003	2.39E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-04	1.05E+00	1.89E-05	1.67E-01	8.96E-05	7.78E-01	0.00E+00	0.00E+00
Ethylbenzene	100414	3.47E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-04	1.52E+00	2.75E-05	2.43E-01	1.30E-04	1.13E+00	0.00E+00	0.00E+00
Ethylene Dibromide (EDB)	106934	3.06E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-04	1.34E+00	2.42E-05	2.14E-01	1.15E-04	9.97E-01	0.00E+00	0.00E+00
Ethylene Dichloride (EDC)	107062	5.89E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.97E-05	2.59E-01	4.66E-06	4.12E-02	2.21E-05	1.92E-01	0.00E+00	0.00E+00
Formaldehyde	50000	3.98E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.01E-04	1.75E+00	3.15E-05	2.79E-01	1.49E-04	1.30E+00	0.00E+00	0.00E+00
Hexane	110543	8.12E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.09E-04	3.56E+00	6.43E-05	5.68E-01	3.05E-04	2.64E+00	0.00E+00	0.00E+00
Isopropyl Alcohol	67630	1.62E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.17E-04	7.11E+00	1.28E-04	1.13E+00	6.08E-04	5.28E+00	0.00E+00	0.00E+00
Isopropylbenzene (Cumene)	98828	5.61E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.83E-05	2.46E-01	4.44E-06	3.93E-02	2.10E-05	1.83E-01	0.00E+00	0.00E+00
Methyl Ethyl Ketone (2-butanone)	78933	1.46E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.36E-03	6.41E+01	1.16E-03	1.02E+01	5.48E-03	4.76E+01	0.00E+00	0.00E+00
Methyl Isobutyl Ketone	108101	7.09E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.57E-04	3.11E+00	5.61E-05	4.96E-01	2.66E-04	2.31E+00	0.00E+00	0.00E+00
Napthalene	91203	1.16E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.85E-04	5.09E+00	9.18E-05	8.12E-01	4.35E-04	3.78E+00	0.00E+00	0.00E+00
Perchloroethylene	127184	6.51E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E-04	2.86E+00	5.15E-05	4.56E-01	2.44E-04	2.12E+00	0.00E+00	0.00E+00
Styrene	100425	3.59E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-04	1.58E+00	2.84E-05	2.51E-01	1.35E-04	1.17E+00	0.00E+00	0.00E+00
t-1,4-Dichloro-2-butene	764410	8.92E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.50E-04	3.92E+00	7.06E-05	6.24E-01	3.35E-04	2.91E+00	0.00E+00	0.00E+00
Toluene	108883	1.07E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.39E-04	4.70E+00	8.47E-05	7.49E-01	4.01E-04	3.48E+00	0.00E+00	0.00E+00
Trichlorofluoromethane*	75694	1.08E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.45E-08	4.74E-04	8.55E-09	7.56E-05	4.05E-08	3.52E-04	0.00E+00	0.00E+00
Vinyl acetate	108054	1.97E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.93E-04	8.65E+00	1.56E-04	1.38E+00	7.39E-04	6.42E+00	0.00E+00	0.00E+00
Xylenes	1330207	1.80E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.08E-04	7.90E+00	1.43E-04	1.26E+00	6.75E-04	5.86E+00	0.00E+00	0.00E+00

Name		Agricultural Lagoon Emissions from Dairy Operations									
Applicability	Use this spreadsheet when the emissions are from a Dairy Lagoon sources and the VOC rates are known. The VOC rates are linked to the RMR worksheet cells VOC rates in 'Lagoon/Storage Pond row'. Enter values into the Lagoon area calculator on the right to determine area fraction(s). Total ammonia value is linked to the RMR worksheet cells, 'Lagoon/Storage Pond'. Individual Lagoon values are calculated by multiplying the total lagoon ammonia by their area fraction. Entries required in yellow areas, output in gray areas.										
Author or updater	Matthew Cegielski	Last Update	September 12, 2018								
Facility:	Goninho Heifer Ranch										
ID#:	0										
Project #:	0										
Inputs	lb/hr	lb/yr	Formula								
VOC Rate	0	767	Emissions are calculated by the multiplication of the VOC rates, area fraction, and emission factors.								
			Lagoon Area Fraction		1.00		0.00		0.00		
Substances	CAS#	Emissions Factors lb/VOC*	LB/HR	LB/YR	Lagoon LB/HR	Lagoon LB/YR	Lagoon 2 LB/HR	Lagoon 2 LB/YR	Lagoon 3 LB/HR	Lagoon 3 LB/YR	
1,1,2,2-Tetrachloroethane	79345	3.44E-02	3.01E-03	2.63E+01	3.01E-03	2.63E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,1,2-Trichloroethane	79005	7.94E-03	6.95E-04	6.08E+00	6.95E-04	6.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2,4-Trimethylbenzene	95636	2.94E-02	2.57E-03	2.25E+01	2.57E-03	2.25E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2-Dichlorobenzene	95501	6.25E-02	5.47E-03	4.79E+01	5.47E-03	4.79E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,3-Dichlorobenzene	541731	4.94E-02	4.32E-03	3.78E+01	4.32E-03	3.78E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,3-Dichloropropene	542756	7.44E-03	6.51E-04	5.70E+00	6.51E-04	5.70E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,4 Dioxane	123911	2.50E-02	2.19E-03	1.92E+01	2.19E-03	1.92E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,4-Dichloro-2-butene	764410	6.88E-02	6.02E-03	5.27E+01	6.02E-03	5.27E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,4-Dichlorobenzene	106467	5.19E-02	4.54E-03	3.98E+01	4.54E-03	3.98E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Acetaldehyde	75070	1.56E-02	1.37E-03	1.20E+01	1.37E-03	1.20E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Acrylonitrile	107131	7.31E-03	6.40E-04	5.61E+00	6.40E-04	5.61E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzene	71432	2.88E-03	2.52E-04	2.20E+00	2.52E-04	2.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzyl chloride	100447	3.13E-02	2.73E-03	2.40E+01	2.73E-03	2.40E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Carbon disulfide	75150	3.94E-02	3.45E-03	3.02E+01	3.45E-03	3.02E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Chlorobenzene	108907	1.31E-02	1.15E-03	1.01E+01	1.15E-03	1.01E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Cumene	98828	1.94E-02	1.70E-03	1.49E+01	1.70E-03	1.49E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Cyclohexane	110827	8.19E-03	7.16E-04	6.28E+00	7.16E-04	6.28E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Ethyl Chloride	75003	4.63E-03	4.05E-04	3.55E+00	4.05E-04	3.55E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Ethylbenzene	100414	1.00E-02	8.75E-04	7.67E+00	8.75E-04	7.67E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Ethylene Dibromide (EDB)	106934	1.44E-02	1.26E-03	1.10E+01	1.26E-03	1.10E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Ethylene Dichloride (EDC)	107062	4.06E-03	3.55E-04	3.11E+00	3.55E-04	3.11E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Formaldehyde	50000	8.13E-03	7.11E-04	6.23E+00	7.11E-04	6.23E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Hexane	110543	4.31E-03	3.77E-04	3.31E+00	3.77E-04	3.31E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Isopropyl Alcohol	67630	7.50E-03	6.56E-04	5.75E+00	6.56E-04	5.75E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Methyl Ethyl Ketone	78933	1.38E-02	1.20E-03	1.05E+01	1.20E-03	1.05E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Methyl Isobutyl Ketone	108101	1.13E-02	9.90E-04	8.67E+00	9.90E-04	8.67E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Napthalene	91203	1.88E-01	1.64E-02	1.44E+02	1.64E-02	1.44E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Perchloroethylene	127184	1.75E-01	1.53E-02	1.34E+02	1.53E-02	1.34E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Styrene	100425	1.63E-02	1.42E-03	1.25E+01	1.42E-03	1.25E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Toluene	108883	1.25E-02	1.09E-03	9.58E+00	1.09E-03	9.58E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Trichloroethylene	79016	1.12E-02	9.79E-04	8.58E+00	9.79E-04	8.58E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Xylenes	1330207	1.88E-02	1.64E-03	1.44E+01	1.64E-03	1.44E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Ammonia	7664417				3.000E-01	2.628E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

## Godinho Heifer Phase I Construction DPM

### Merced County, Annual

## 1.0 Project Characteristics

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### 1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	212.20	1000sqft	4.87	212,200.00	0

### 1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	49
Climate Zone	3			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

### 1.3 User Entered Comments & Non-Default Data

Godinho Heifer Phase I Construction DPM - Merced County, Annual

Project Characteristics -

Land Use -

Construction Phase - Estimated Construction Schedule of 6 months

Trips and VMT - Run is for on-site DPM estimates. Therefore, worker trips have been set to zero.

Grading - Run is for on-site DPM estimates. Therefore, grading acres for fugitive dust have been set to zero.

Vehicle Trips - Construction Run Only

Consumer Products - Construction Run Only

Area Coating - Construction Run Only

Landscape Equipment - Construction Run Only

Energy Use - Construction Run Only

Water And Wastewater - Construction Run Only

Solid Waste - Construction Run Only

Construction Off-road Equipment Mitigation -

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	68250	92500
tblAreaCoating	Area_Nonresidential_Interior	204750	277500
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	230.00	117.00
tblConstructionPhase	NumDays	8.00	10.00
tblEnergyUse	LightingElect	2.70	0.00
tblEnergyUse	NT24E	4.16	0.00
tblEnergyUse	NT24NG	3.84	0.00
tblEnergyUse	T24E	1.96	0.00
tblEnergyUse	T24NG	17.03	0.00
tblGrading	AcresOfGrading	5.00	0.00
tblSolidWaste	SolidWasteGenerationRate	169.26	0.00
tblTripsAndVMT	VendorTripNumber	22.00	0.00
tblTripsAndVMT	WorkerTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	57.00	0.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	WD_TR	6.97	0.00
tblWater	IndoorWaterUseRate	31,565,625.00	0.00

## 2.0 Emissions Summary

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Godinho Heifer Phase I Construction DPM - Merced County, Annual

## 2.1 Overall Construction

### Unmitigated Construction

[illegible]

### Mitigated Construction

[illegible][illegible]

Godinho Heifer Phase I Construction DPM - Merced County, Annual

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

## 2.2 Overall Operational

### Unmitigated Operational

[illegible]

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

**2.2 Overall Operational****Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area						1.0000e-005	1.0000e-005									
Energy						0.0000	0.0000									
Mobile						0.0000	0.0000									
Waste						0.0000	0.0000									
Water						0.0000	0.0000									
<b>Total</b>						<b>1.0000e-005</b>	<b>1.0000e-005</b>									

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
<b>Percent Reduction</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

**3.0 Construction Detail****Construction Phase**

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2020	1/7/2020	5	5	
2	Grading	Grading	1/8/2020	1/21/2020	5	10	
3	Building Construction	Building Construction	1/22/2020	7/2/2020	5	117	

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

**Acres of Grading (Site Preparation Phase): 0****Acres of Grading (Grading Phase): 0****Acres of Paving: 0****Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

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

**Trips and VMT**

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

Godinho Heifer Phase I Construction DPM - Merced County, Annual

### 3.1 Mitigation Measures Construction

## Reduce Vehicle Speed on Unpaved Roads

### 3.2 Site Preparation - 2020

### Unmitigated Construction On-Site

[illegible]

Godinho Heifer Phase I Construction DPM - Merced County, Annual

### 3.2 Site Preparation - 2020

### Unmitigated Construction Off-Site

[illegible]

### Mitigated Construction On-Site

[illegible]

Godinho Heifer Phase I Construction DPM - Merced County, Annual

### 3.2 Site Preparation - 2020

### Mitigated Construction Off-Site

[illegible]

### 3.3 Grading - 2020

### Unmitigated Construction On-Site

[illegible]

Godinho Heifer Phase I Construction DPM - Merced County, Annual

### 3.3 Grading - 2020

### Unmitigated Construction Off-Site

[illegible]

### Mitigated Construction On-Site

[illegible]



Godinho Heifer Phase I Construction DPM - Merced County, Annual

### 3.4 Building Construction - 2020

### Unmitigated Construction Off-Site

[illegible]

### Mitigated Construction On-Site

[illegible]

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

**3.4 Building Construction - 2020****Mitigated Construction Off-Site**

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

**4.0 Operational Detail - Mobile****4.1 Mitigation Measures Mobile**

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

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

## 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

## 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

## 4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.484945	0.031816	0.154973	0.120992	0.021332	0.005119	0.015709	0.151573	0.002377	0.002347	0.006486	0.001616	0.000714

## 5.0 Energy Detail

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Historical Energy Use: N



## Godinho Heifer Phase I Construction DPM - Merced County, Annual

**5.2 Energy by Land Use - NaturalGas****Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0						0.0000	0.0000									
<b>Total</b>							<b>0.0000</b>	<b>0.0000</b>									

**5.3 Energy by Land Use - Electricity****Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0				
<b>Total</b>					

Godinho Heifer Phase I Construction DPM - Merced County, Annual

### 5.3 Energy by Land Use - Electricity

**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0				
<b>Total</b>					

## 6.0 Area Detail

## 6.1 Mitigation Measures Area

[illegible]

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

**6.2 Area by SubCategory****Unmitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating						0.0000	0.0000									
Consumer Products						0.0000	0.0000									
Landscaping						1.0000e-005	1.0000e-005									
<b>Total</b>						<b>1.0000e-005</b>	<b>1.0000e-005</b>									

**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating						0.0000	0.0000									
Consumer Products						0.0000	0.0000									
Landscaping						1.0000e-005	1.0000e-005									
<b>Total</b>						<b>1.0000e-005</b>	<b>1.0000e-005</b>									

**7.0 Water Detail**

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

**7.1 Mitigation Measures Water**

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				
Unmitigated				

**7.2 Water by Land Use****Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0				
<b>Total</b>					

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

**7.2 Water by Land Use****Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0				
<b>Total</b>					

**8.0 Waste Detail****8.1 Mitigation Measures Waste****Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				
Unmitigated				

## Godinho Heifer Phase I Construction DPM - Merced County, Annual

**8.2 Waste by Land Use****Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0				
<b>Total</b>					

**Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0				
<b>Total</b>					

**9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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## Godinho Heifer Phase I Construction DPM - Merced County, Annual

## 10.0 Stationary Equipment

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### Fire Pumps and Emergency Generators

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

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

Equipment Type	Number
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## 11.0 Vegetation

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## Godinho Heifer Phase II Construction DPM - Merced County, Annual

## Godinho Heifer Phase II Construction DPM

### Merced County, Annual

## 1.0 Project Characteristics

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### 1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	102.00	1000sqft	2.34	102,000.00	0

### 1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	49
Climate Zone	3			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

### 1.3 User Entered Comments & Non-Default Data

Godinho Heifer Phase II Construction DPM - Merced County, Annual

Project Characteristics -

Land Use -

Construction Phase - Estimated Construction Schedule of 4 months

Trips and VMT - Run is for on-site DPM estimates. Therefore, worker trips have been set to zero.

Grading - Run is for on-site DPM estimates. Therefore, grading acres for fugitive dust have been set to zero.

Vehicle Trips - Construction Run Only

Consumer Products - Construction Run Only

Area Coating - Construction Run Only

Landscape Equipment - Construction Run Only

Energy Use - Construction Run Only

Water And Wastewater - Construction Run Only

Solid Waste - Construction Run Only

Construction Off-road Equipment Mitigation -

## Godinho Heifer Phase II Construction DPM - Merced County, Annual

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	68250	92500
tblAreaCoating	Area_Nonresidential_Interior	204750	277500
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	230.00	75.00
tblConstructionPhase	PhaseEndDate	6/4/2021	10/31/2020
tblEnergyUse	LightingElect	2.70	0.00
tblEnergyUse	NT24E	4.16	0.00
tblEnergyUse	NT24NG	3.84	0.00
tblEnergyUse	T24E	1.96	0.00
tblEnergyUse	T24NG	17.03	0.00
tblGrading	AcresOfGrading	5.00	0.00
tblSolidWaste	SolidWasteGenerationRate	169.26	0.00
tblTripsAndVMT	VendorTripNumber	22.00	0.00
tblTripsAndVMT	WorkerTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	57.00	0.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	WD_TR	6.97	0.00
tblWater	IndoorWaterUseRate	31,565,625.00	0.00

## 2.0 Emissions Summary

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Godinho Heifer Phase II Construction DPM - Merced County, Annual

## 2.1 Overall Construction

### Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020						0.0525	0.1278									
Maximum						0.0525	0.1278									

### Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	:	:	:	:	:	0.0525	0.1278	:	:	:	:	:	:	:	:	:
Maximum						0.0525	0.1278									

[illegible]

Godinho Heifer Phase II Construction DPM - Merced County, Annual

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

## 2.2 Overall Operational

### Unmitigated Operational

[illegible]

## Godinho Heifer Phase II Construction DPM - Merced County, Annual

**2.2 Overall Operational****Mitigated Operational**

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
<b>Percent Reduction</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

**3.0 Construction Detail****Construction Phase**

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/1/2020	7/7/2020	5	5	
2	Grading	Grading	7/8/2020	7/17/2020	5	8	
3	Building Construction	Building Construction	7/18/2020	10/31/2020	5	75	

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**Acres of Grading (Site Preparation Phase): 0****Acres of Grading (Grading Phase): 0****Acres of Paving: 0****Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

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

**Trips and VMT**

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

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### 3.1 Mitigation Measures Construction

## Reduce Vehicle Speed on Unpaved Roads

### 3.2 Site Preparation - 2020

### Unmitigated Construction On-Site

[illegible]

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### 3.2 Site Preparation - 2020

### Unmitigated Construction Off-Site

[illegible]

### Mitigated Construction On-Site

[illegible]

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### 3.2 Site Preparation - 2020

### Mitigated Construction Off-Site

[illegible]

### 3.3 Grading - 2020

### Unmitigated Construction On-Site

[illegible]

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### 3.3 Grading - 2020

### Unmitigated Construction Off-Site

[illegible]

### Mitigated Construction On-Site

[illegible]

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### 3.3 Grading - 2020

### Mitigated Construction Off-Site

[illegible]

### 3.4 Building Construction - 2020

### Unmitigated Construction On-Site

[illegible]

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### 3.4 Building Construction - 2020

### Unmitigated Construction Off-Site

[illegible]

### Mitigated Construction On-Site

[illegible]

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**3.4 Building Construction - 2020****Mitigated Construction Off-Site**

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

**4.0 Operational Detail - Mobile****4.1 Mitigation Measures Mobile**

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

## 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

## 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

## 4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.484945	0.031816	0.154973	0.120992	0.021332	0.005119	0.015709	0.151573	0.002377	0.002347	0.006486	0.001616	0.000714

## 5.0 Energy Detail

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Historical Energy Use: N



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**5.2 Energy by Land Use - NaturalGas****Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0						0.0000	0.0000									
<b>Total</b>							<b>0.0000</b>	<b>0.0000</b>									

**5.3 Energy by Land Use - Electricity****Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0				
<b>Total</b>					

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### 5.3 Energy by Land Use - Electricity

**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0				
<b>Total</b>					

## 6.0 Area Detail

## 6.1 Mitigation Measures Area

[illegible]

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**6.2 Area by SubCategory****Unmitigated**

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

**Mitigated**

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

**7.0 Water Detail**

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**7.1 Mitigation Measures Water**

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				
Unmitigated				

**7.2 Water by Land Use****Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0				
<b>Total</b>					

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**7.2 Water by Land Use****Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0				
<b>Total</b>					

**8.0 Waste Detail****8.1 Mitigation Measures Waste****Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				
Unmitigated				

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**8.2 Waste by Land Use****Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0				
<b>Total</b>					

**Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0				
<b>Total</b>					

**9.0 Operational Offroad**

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

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**Fire Pumps and Emergency Generators**

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

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

Equipment Type	Number
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**11.0 Vegetation**

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