APPENDIX D

Toste Dairy HRA and AAQA

This page intentionally
left blank.

HEALTH RISK ASSESSMENT
Toste Dairy Expansion

609 Santa Fe Grade
Newman, CA 95360
Merced County

Prepared By:

Matt Daniel – Senior Consultant

INSIGHT ENVIRONMENTAL CONSULTANTS, INC.
5500 Ming Avenue, Suite 140
Bakersfield, CA 93309
661-282-2200

May 2020

Project 190505.0265

Insight Environmental Consultants | Trinity Consultants

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. EXECUTIVE SUMMARY

This document contains the health risk assessment performed on behalf of Environmental Planning Partners, Inc. for an expansion of the existing Toste Dairy 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 dairy expansion. The Proposed Project also includes the Canal School Road West Feedlot and the Preston Road South Feedlot, however, there are no changes proposed for the two feedlots and were therefore not analyzed as part of this health risk assessment.

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.

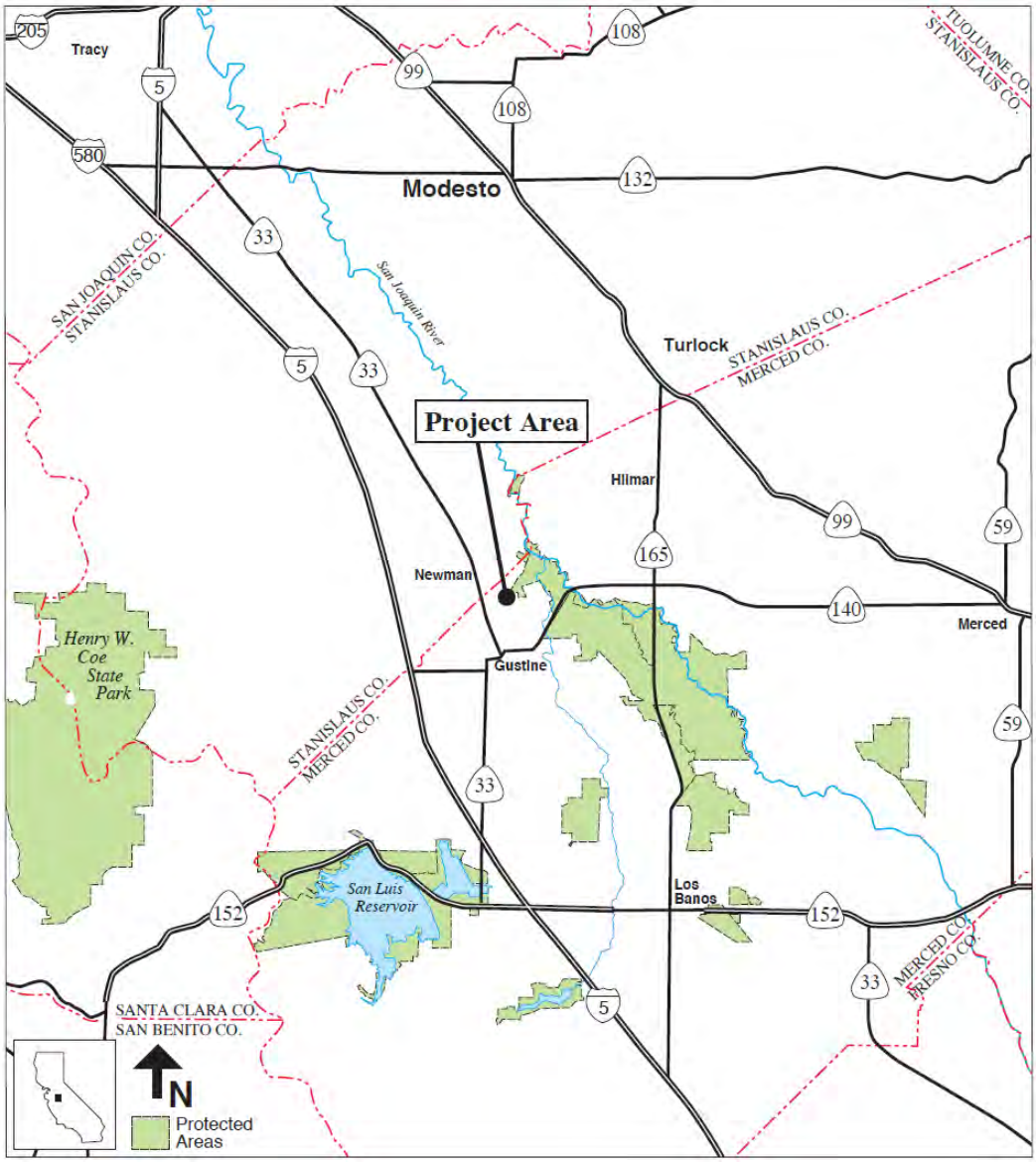
The San Joaquin Valley Air Pollution Control District (SJVAPCD) has set the level of significance for carcinogenic risk to twenty in one million (20×10^{-6}), which is understood as the possibility of causing twenty additional cancer cases in a population of one million people. The level of significance for acute and chronic non-cancer risk is a hazard index of 1.0. The maximum predicted cancer risk among the modeled receptors is 19.3 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 0.272 and 0.104, 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 polices (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 Toste Dairy 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 dairy is located at 609 Santa Fe Grade in Newman, 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 two new animal structures totaling 221,000 square feet which would take approximately 6 months of construction time within the 8 to 10 years after application approval. Phase 2 construction would consist of new animal shelters totaling 147,000 square feet sometime within 10 years after Phase 1 construction totaling 4 months of actual construction activities. All proposed construction would occur within the existing facility footprint.

After modification, the dairy will house approximately 5,000 head of cattle. The existing and proposed herd configuration is provided in Table 2-1. The dairy will continue to operate 24 hours per day and 365 days per year.

Table 2-1. Herd Configuration – Existing and Proposed

	Current	Proposed	Increment
Milk Cows	1,500	2,500	1,000
Dry Cows	450	500	50
Bred Heifers 15-24 mos.	0	0	0
Heifers 7-14 mos.	400	1,800	1,400
Heifers 4-6 mos.	200	200	0
Calves 0-3 mos.	0	0	0
Bulls	0	0	0
TOTAL	**2,550**	**5,000**	**2,450**

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 dairy operation.

3.1. HAZARD IDENTIFICATION

The basis for evaluating potential health risk is the identification of sources of hazardous air pollutants (HAPs). The proposed dairy will include sources with the potential to emit HAPs. Pursuant to guidance by the San Joaquin Valley Air Pollution Control District[1] (SJVAPCD), emissions based on the current configuration of the dairy 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 dairy 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 include a diesel-fueled feed loading tractor, a manure loading tractor, a feed delivery tractor, a bedding delivery tractor, milk tankers, solid removal trucks and commodity delivery trucks. The increased herd size will require additional tractor use for feed loading and delivery, bedding delivery, manure scraping and solid manure loading. Additional truck trips will be required for milk tankers, solid removal trucks and commodity delivery trucks. There will also be emission increases from the new freestalls, milk barn, lagoons, solid manure storage and land application areas associated with increased herd size. HRA emission sources with increased emissions are listed in **Table 3-1**.

Table 3-1. Sources of Potential Emissions

Source ID	Description
MTI, MTT	Milk Truck Idling and Travel
CTI, CTT	Commodity Truck Idling and Travel
SRTI, SRTT	Solids Removal Truck Idling and Travel
FLT	Feed Loading
MLT	Solids Removal (Loader)
FBTD1-3	Feed and Bedding Delivery
MS1-3	Manure Scraping
FSB2-5	New Freestall Barns
SMS	Solid Manure Storage
MILK1	Milk Barn
SLA1-3	Solids Land Application
LLA1-3	Liquid Land Application
LAGOON1,3	Lagoons
CONSTP1	Phase 1 Construction Activities
CONSTP2	Phase 2 Construction Activities

[1] 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_{10} 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 new lagoon's H_2S emissions were assumed to be 10% of the NH3 lagoon emissions. This assumption was taken from the SJVAPCD's dairy calculator.

The actual total construction activities of both Phase 1 and Phase 2 was estimated to be 10 months based on other dairy 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 dairy expansion. The construction activities, animal housing areas, milk barn, lagoons, manure scraping, 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, milk trucks, solids 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 feed loading tractor, manure loading tractor, milk truck idling, solids 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[2] 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 dairy 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 213 off-site receptors of residences, 2 on-site receptors, 166 potential agricultural workers were assessed during the preparation of this HRA. There is currently one other on-site residence, however, this residence is occupied by the dairy owner. Therefore, the owner's residence is exempt from being modeled.[3] Coordinates for the point of maximum impact (PMI) receptors are provided in **Table 2-3**.

[2] Provided via website, San Joaquin Valley Air Pollution Control District (SJVAPCD), ftp://12.219.204.27/public/Modeling/Meteorological_Data/AERMET_v16216/Modesto_23258/
[3] Personal communication with Leland Villalvazo, SJVAPCD, November 1, 2012.

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 (20×10^{-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 19.26E-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 0.272. Acute risks are primarily attributable to emissions of H_2S, which affects the central nervous system. Acute risks are tabulated by pollutant in **Table 3-5**.

The maximum predicted chronic non-cancer hazard index is 0.104. Chronic risks, tabulated by pollutant in **Table 3-6**, are primarily attributable to emissions of arsenic and ammonia which affect the respiratory system.

Table 3-3. Risk Predicted By HARP

	Maximum Lifetime Excess Cancer Risk	Maximum Non-Cancer Chronic Hazard Index	Maximum Non-Cancer Acute Hazard Index
Construction	6.96E-06	6.56E-03	0.00E+00
Operational	12.3E-06	9.76E-02	2.72E-01
Total	19.3E-06	1.04E-01	2.72E-01
Receptor #, Name	2, On-Site Residence	1, Off-Site Residence	343, Off-Site Worker
UTM Easting (m)	678378.29	678250.76	678167.40
UTM Northing (m)	4129807.92	4129966.13	4130281.68

Table 3-4. Risk by Pollutant – Maximum Cancer Risk at Receptor #2

CHEM	INHAL	SOIL	DERM	MOTHER	WATER	FISH	CROP	BEEF	DAIRY	PIG	CHICK	EGG	TOTAL
DieselExhPM	9.02E-06	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.02E-06
TetraClEthane	7.89E-07	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.89E-07
1,1,2TriClEthan	9.55E-08	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.55E-08
DBCP	1.18E-06	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.18E-06
1,4-Dioxane	2.07E-07	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.07E-07
p-DiClBenzene	3.07E-07	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.07E-07
Acetaldehyde	1.00E-07	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.00E-07
Acrylonitrile	1.66E-06	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.66E-06
Benzene	1.42E-07	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.42E-07
Benzyl Chloride	7.73E-07	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.73E-07
CCl4	3.00E-08	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.00E-08
Chloroform	8.50E-09	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.50E-09
Ethyl Benzene	2.02E-08	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.02E-08
EDB	6.71E-07	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.71E-07
EDC	4.78E-08	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.78E-08
Formaldehyde	4.80E-08	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.80E-08
Naphthalene	3.04E-06	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.04E-06
Perc	4.65E-07	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.65E-07
Arsenic	7.37E-08	3.98E-07	1.70E-08	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.89E-07
Cr(VI)	1.37E-07	5.81E-09	8.25E-11	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.43E-07
Lead	5.65E-10	4.94E-09	1.05E-10	5.41E-11	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.66E-09
Nickel	2.45E-09	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.45E-09
TCE	8.93E-09	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.93E-09
SUM	1.88E-05	4.09E-07	1.72E-08	5.41E-11	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.93E-05

Table 3-5. Risk by Pollutant – Maximum Acute Noncancer Risk at Receptor #343

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	7.53E-02	0.00E+0	7.53E-02	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	7.53E-02
1,4-Dioxane	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-04	0.00E+0	1.80E-04	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.80E-04
Acetaldehyde	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.94E-04	0.00E+0	9.94E-04	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	9.94E-04
Benzene	0.00E+0	0.00E+00	2.79E-03	0.00E+00	0.00E+00	2.79E-03	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	2.79E-03	0.00E+00	0.00E+00	2.79E-03
Benzyl Chloride	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-03	0.00E+0	2.28E-03	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.28E-03
CS2	0.00E+0	1.41E-04	0.00E+00	0.00E+00	0.00E+00	1.41E-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	1.41E-04
CCl4	0.00E+0	2.63E-06	0.00E+00	0.00E+00	2.63E-06	2.63E-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	2.63E-06
Chloroform	0.00E+0	7.44E-05	0.00E+00	0.00E+00	0.00E+00	7.44E-05	7.44E-05	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	7.44E-05
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	3.09E-03	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.09E-03
Isopropyl Alcoh	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.24E-05	0.00E+0	8.24E-05	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	8.24E-05
MEK	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-04	0.00E+0	1.13E-04	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.13E-04
Perc	0.00E+0	1.49E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-04	0.00E+0	1.49E-04	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.49E-04
Styrene	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-05	1.44E-05	0.00E+0	1.44E-05	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.44E-05
Toluene	0.00E+0	8.12E-06	0.00E+00	0.00E+00	0.00E+00	8.12E-06	8.12E-06	0.00E+0	8.12E-06	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	8.12E-06
Xylenes	0.00E+0	2.13E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.13E-05	0.00E+0	2.13E-05	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.13E-05
Arsenic	9.40E-04	9.40E-04	0.00E+00	0.00E+00	0.00E+00	9.40E-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	9.40E-04
Copper	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-05	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.55E-05
Mercury	0.00E+0	7.83E-05	0.00E+00	0.00E+00	0.00E+00	7.83E-05	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	7.83E-05
Nickel	0.00E+0	0.00E+00	4.11E-04	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	4.11E-04
SULFATES	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.13E-04	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	7.13E-04
Vanadium	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-05	0.00E+0	1.18E-05	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.18E-05
H2S	0.00E+0	2.71E-01	0.00E+00	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	2.71E-01
SUM	9.40E-04	2.72E-01	3.20E-03	0.00E+00	2.63E-06	4.05E-03	7.99E-02	0.00E+0	8.22E-02	0.00E+00	0.00E+0	2.79E-03	0.00E+00	0.00E+00	2.72E-01

Table 3-6. Risk by Pollutant – Maximum Chronic Noncancer Risk at Receptor #1

CHEM	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL	MAX
DieselExhPM	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	7.23E-03	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	7.23E-03
NH3	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	4.22E-02	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.22E-02
1,4-Dioxane	3.33E-06	0.00E+0	0.00E+0	3.33E-06	3.33E-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	3.33E-06
p-DiClBenzene	0.00E+00	1.38E-05	0.00E+0	1.38E-05	1.38E-05	0.00E+0	1.38E-05	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.38E-05
Acetaldehyde	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	8.87E-05	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	8.87E-05
Acrylonitrile	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	4.47E-04	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.47E-04
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	5.94E-04	0.00E+00	0.00E+00	5.94E-04
CS2	0.00E+00	2.10E-05	0.00E+0	0.00E+0	0.00E+00	2.10E-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	2.10E-05
CCl4	0.00E+00	5.93E-06	0.00E+0	0.00E+0	5.93E-06	5.93E-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	5.93E-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	1.77E-06	1.77E-06	1.77E-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	1.77E-06
Ethyl Chloride	0.00E+00	0.00E+0	0.00E+0	0.00E+0	5.87E-08	5.87E-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	5.87E-08
Ethyl Benzene	0.00E+00	0.00E+0	0.00E+0	1.56E-06	1.56E-06	1.56E-06	0.00E+0	0.00E+00	0.00E+0	0.00E+0	1.56E-06	0.00E+00	0.00E+00	0.00E+00	1.56E-06
EDB	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	4.63E-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	4.63E-03
EDC	0.00E+00	0.00E+0	0.00E+0	0.00E+0	2.34E-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	2.34E-06
Formaldehyde	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	3.34E-04	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.34E-04
Hexane	0.00E+00	5.75E-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	5.75E-07
Isopropyl Alcoh	0.00E+00	0.00E+0	0.00E+0	1.12E-06	0.00E+00	1.12E-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	1.12E-06
Naphthalene	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	4.10E-03	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	4.10E-03
Perc	0.00E+00	0.00E+0	0.00E+0	9.33E-04	9.33E-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	9.33E-04
Styrene	0.00E+00	4.71E-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	4.71E-06
Toluene	0.00E+00	2.16E-05	0.00E+0	0.00E+0	0.00E+00	2.16E-05	2.16E-05	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	2.16E-05
Vinyl Acetate	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	3.98E-05	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.98E-05
Xylenes	0.00E+00	1.50E-05	0.00E+0	0.00E+0	0.00E+00	0.00E+0	1.50E-05	0.00E+00	1.50E-05	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.50E-05
Arsenic	3.68E-02	3.68E-02	0.00E+0	0.00E+0	0.00E+00	3.68E-02	3.68E-02	3.68E-02	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.68E-02
Cr(VI)	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	2.74E-06	0.00E+00	0.00E+0	0.00E+0	0.00E+0	2.57E-07	0.00E+00	0.00E+00	2.74E-06
Manganese	0.00E+00	6.61E-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	6.61E-03
Mercury	0.00E+00	2.95E-04	0.00E+0	2.95E-04	0.00E+00	2.95E-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	2.95E-04
Nickel	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	4.68E-06	3.92E-04	0.00E+00	0.00E+0	0.00E+0	0.00E+0	3.92E-04	0.00E+00	0.00E+00	3.92E-04
Selenium	1.54E-06	1.54E-06	0.00E+0	0.00E+0	1.54E-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	1.54E-06
TCE	0.00E+00	3.20E-06	0.00E+0	0.00E+0	0.00E+00	0.00E+0	0.00E+0	0.00E+00	3.20E-06	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	3.20E-06
H2S	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+0	1.25E-02	0.00E+00	0.00E+0	0.00E+0	0.00E+0	0.00E+00	0.00E+00	0.00E+00	1.25E-02
SUM	3.68E-02	4.38E-02	0.00E+0	1.25E-03	9.67E-04	4.18E-02	1.04E-01	3.68E-02	1.82E-05	0.00E+0	1.56E-06	9.87E-04	0.00E+00	0.00E+00	1.04E-01

4. CONCLUSIONS

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 TOSTE Dairy 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

Auer, Jr., A.H., 1978. Correlation of Land Use and Cover with Meteorological Anomalies. Journal of Applied Meteorology, 17(5): 636-643, 1978.

California Air Pollution Control Officers Association (CAPCOA). 2017. California Emissions Estimator Model tm (CalEEMod), version 2016.3.2, released October 2017. Available online at: http://caleemod.com/

California Environmental Protection Agency Air Resources Board (CARB). 2003. *HARP User Guide*. Released December 2003.

----------. 2015. *Air Dispersion Modeling and Risk Tool*. Version 15197. July 16, 2015. Downloaded from http://www.arb.ca.gov/toxics/harp/harp.htm

California Environmental Quality Act, *Appendix G – Environmental Checklist Form, Final Text.* October 26, 1998.

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines, Appendix H, Accessed January 7, 2016. <http://www.oehha.ca.gov/air/hot_spots/2015/2015GMAppendicesG_J.pdf>

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2000. *Environmental Review Guidelines Procedures for Implementing the California Environmental Quality Act*. August 2000.

----------. 2007. *Guidance for Air Dispersion Modeling (Working Draft).* January 2007.

----------. 2012. *Dairy H_2S AERMOD Hourly Emission File Generator, Version 1.0.* September 2012.

----------. 2015a. Guide for Assessing and Mitigating Air Quality Impacts. March 19, 2015.

----------. 2015b. APR -1906 Framework for Performing Health Risk Assessments. June 30, 2015.

----------. 2015c. APR -1905 Risk Management Policy for Permitting New and Modified Sources. May 28, 2015.

SCAQMD. 2006. Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM2.5 Significance Thresholds. October 2006. <http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/particulate-matter-(pm)-2.5-significance-thresholds-and-calculation-methodology/final_pm2_5methodology.pdf?sfvrsn=2

Villalvazo, Leland. 2015. Supervising Atmospheric Modeler, SJVAPCD. Email to Kathy Parker at Insight Environmental Consultants, August 3, 2015.

APPENDIX A: EMISSION ESTIMATION WORKSHEETS

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	MTT	0.44	2.52	728	1.77E+00	4.87E-03
Commodity Delivery	CTT	0.70	2.52	364	1.42E+00	3.90E-03
Solid Manure	SRTT	0.40	2.52	780	1.73E+00	6.64E-03

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	MTI	0.46	15	728	1.83E-01	5.02E-04
Commodity Delivery	CTI	0.46	15	364	9.13E-02	2.51E-04
Solid Manure	SRTI	0.46	15	780	1.96E-01	7.53E-04

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	FLT	106	0.37	2	365	1.49E-02	9.41E-01	2.58E-03
Bedding Delivery	FBTD1-3	139	0.37	1.54	52	1.49E-02	1.35E-01	2.60E-03
Manure Scraping	MS1-3	139	0.37	4	4	1.49E-02	2.71E-02	6.76E-03
Manure Loading	MLT	160	0.37	0.36	365	1.49E-02	2.53E-01	6.93E-04
Feed Delivery	FBTD1-3	140	0.37	4	365	1.49E-02	2.49E+00	6.81E-03

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

Rev. May 7, 2019

Pre-Project Facility Information

1. Does this facility house Holstein or Jersey cows? Holstein
   Most facilities house Holstein cows unless explicitly stated on the PTO or application.
2. Does the facility have an anaerobic treatment lagoon? no
3. Does the facility land apply liquid manure? yes
   Answering "yes" assumes worst case.
4. Does the facility land apply solid manure? yes
   Answering "yes" assumes worst case.
5. Is any scraped manure sent to a lagoon/storage pond? yes
   Answering "yes" assumes worst case.

Pre-Project Herd Size

Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals
Milk Cows	1,500				1,500
Dry Cows			450		450
Support Stock (Heifers, Calves, and Bulls)					0
Large Heifers					0
Medium Heifers			400		400
Small Heifers			200		200
Bulls					0

	Calf Hutches				Calf Corrals		
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	Total # of Calves
Calves							0

Total Herd Summary	
Total Milk Cows	1,500
Total Mature Cows	1,950
Support Stock (Heifers, Calves, and Bulls)	600
Total Calves	0
Total Dairy Head	2,550

Pre-Project Silage Information

Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

Post-Project Facility Information

1. Does this facility house Holstein or Jersey cows? Holstein
   Most facilities house Holstein cows unless explicitly stated on the PTO or application.
2. Does the facility have an anaerobic treatment lagoon? no
3. Does the facility land apply liquid manure? yes
   Answering "yes" assumes worst case.
4. Does the facility land apply solid manure? yes
   Answering "yes" assumes worst case.
5. Is any scraped manure sent to a lagoon/storage pond? yes
   Answering "yes" assumes worst case.
6. Does this project result in an increase or relocation of uncovered surface area for any lagoon/storage pond? yes

NOTE: An increase in total lagoon/storage pond surface area may result in an increase in H2S emissions. The District's Technical Services Division may need to conduct H2S modeling.

Post-Project Herd Size

Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals
Milk Cows	2,500				2,500
Dry Cows			500		500
Support Stock (Heifers, Calves, and Bulls)					0
Large Heifers					0
Medium Heifers	1,800				1,800
Small Heifers			200		200
Bulls					0

	Calf Hutches				Calf Corrals		
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	Total # of Calves
Calves							0

Total Herd Summary	
Total Milk Cows	2,500
Total Mature Cows	3,000
Support Stock (Heifers, Calves, and Bulls)	2,000
Total Calves	0
Total Dairy Head	5,000

Post-Project Silage Information

Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

This spreadsheet serves only as a resource to calculate potential emissions from dairies, and may not reflect the final emissions used by the District due to parameters not addressed in this spreadsheet and/or omissions from the spreadsheet. Any other permittable equipment (e.g. IC engines, gasoline tanks, etc.) at a facility will need to be calculated separately. All final calculations used in permitting projects will be conducted by District staff.

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

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 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 1	freestall	milk cows	750	750		☐	☐	☐	☐	☐	☐	☑	☐	☐
2	Freestall 2	freestall	milk cows	250	250		☐	☐	☐	☐	☐	☐	☐	☐	☐
10	Freestall 3	freestall	milk cows	250	250		☐	☐	☐	☐	☐	☐	☐	☐	☐
11	Freestall 4	freestall	milk cows	250	250		☐	☐	☐	☐	☐	☐	☐	☐	☐
12	Corrals 1-6	open corral	dry cows	200	200		☐	☐	☐	☐	☐	☐	☐	☐	☐
13	Corrals 1-6	open corral	medium heifers	400	400		☐	☐	☐	☐	☐	☐	☐	☐	☐
14	Shade 1	saudi style barn	dry cows	100	100		☐	☐	☐	☐	☐	☐	☐	☐	☐
15	Shade 2	saudi style barn	dry cows	150	150		☐	☐	☐	☐	☐	☐	☐	☐	☐
16	Shade 3	saudi style barn	small heifers	200	200		☐	☐	☐	☐	☐	☐	☐	☐	☐
			Pre-Project Total # of Cows	2,550											

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	Freestall 1	freestall	milk cows	750	750	1.370							15%			1.17
2	Freestall 2	freestall	milk cows	250	250	1.370							15%			1.17
10	Freestall 3	freestall	milk cows	250	250	1.370							15%			1.17
11	Freestall 4	freestall	milk cows	250	250	1.370							15%			1.17
12	Corrals 1-6	open corral	dry cows	200	200	5.460							15%			4.64
13	Corrals 1-6	open corral	medium heifers	400	400	10.550							15%			8.97
14	Shade 1	saudi style barn	dry cows	100	100	1.370							15%			1.17
15	Shade 2	saudi style barn	dry cows	150	150	1.370							15%			1.17
16	Shade 3	saudi style barn	small heifers	200	200	1.370							15%			1.17
			Pre-Project Total # of Cows	2,550												

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	Freestall Barn 1	freestall	milk cows	750	750		☐	☑	☑	☐	☐	☐	☑	☑	☐
2	Shade 1	saudi style barn	dry cows	100	332		☐	☑	☑	☐	☐	☐	☑	☑	☐
5	Shade 2	saudi style barn	dry cows	150	150		☐	☑	☑	☐	☐	☐	☑	☑	☐
6	Shade 3	saudi style barn	small heifers	200	200		☐	☑	☑	☐	☐	☐	☑	☑	☐

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 2	freestall	milk cows	650	650		☐	☑	☑	☐	☐	☐	☑	☑	☐
2	Freestall Barn 3	freestall	milk cows	1,100	1,100		☐	☑	☑	☐	☐	☐	☑	☑	☐
3	Freestall Barn 4	freestall	dry cows	250	250		☐	☑	☑	☐	☐	☐	☑	☑	☐
4	Freestall Barn 4	freestall	medium heifers	800	800		☐	☑	☑	☐	☐	☐	☑	☑	☐
5	Freestall Barn 5	freestall	medium heifers	1,000	1,000		☐	☑	☑	☐	☐	☐	☑	☑	☐
		Post-Project Total # of Cows		5,000	(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	Freestall Barn 1	freestall	milk cows	750	750	1.370		12.5%	10%				15%	15%		0.78
2	Shade 1	saudi style barn	dry cows	100	332	1.370		12.5%	10%				15%	15%		0.78
5	Shade 2	saudi style barn	dry cows	150	150	1.370		12.5%	10%				15%	15%		0.78
6	Shade 3	saudi style barn	small heifers	200	200	1.370		12.5%	10%				15%	15%		0.78

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 2	freestall	milk cows	650	650	1.370		12.5%	10%				15%	15%		0.78
2	Freestall Barn 3	freestall	milk cows	1100	1100	1.370		12.5%	10%				15%	15%		0.78
3	Freestall Barn 4	freestall	dry cows	250	250	1.370		12.5%	10%				15%	15%		0.78
4	Freestall Barn 4	freestall	medium heifers	800	800	1.370		12.5%	10%				15%	15%		0.78
5	Freestall Barn 5	freestall	medium heifers	1000	1000	1.370		12.5%	10%				15%	15%		0.78

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	Freestall 1	milk cows	750	10.88	38.38	1.17	22.4	8,160	78.9	28,782	2.4	874
2	Freestall 2	milk cows	250	10.88	38.38	1.17	7.5	2,720	26.3	9,594	0.8	291
10	Freestall 3	milk cows	250	10.88	38.38	1.17	7.5	2,720	26.3	9,594	0.8	291
11	Freestall 4	milk cows	250	10.88	38.38	1.17	7.5	2,720	26.3	9,594	0.8	291
12	Corrals 1-6	dry cows	200	6.12	19.44	4.64	3.4	1,224	10.7	3,888	2.5	928
13	Corrals 1-6	medium heifers	400	3.2	7.27	8.97	3.5	1,280	8.0	2,909	9.8	3,587
14	Shade 1	dry cows	100	6.12	19.44	1.17	1.7	612	5.3	1,944	0.3	117
15	Shade 2	dry cows	150	6.12	19.44	1.17	2.5	918	8.0	2,916	0.5	175
16	Shade 3	small heifers	200	1.78	5.47	1.17	1.0	356	3.0	1,094	0.6	233
	Pre-Project Total # of Cows		**2,550**				**57.0**	**20,710**	**192.8**	**70,315**	**18.5**	**6,787**

*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)
2,550	57.0	20,710	192.8	70,315	18.5	6,787

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	Freestall Barn 1	milk cows	750	10.22	23.29	0.78	21.0	7,665	47.9	17,469	1.6	584
2	Shade 1	dry cows	100	5.76	11.81	0.78	1.6	576	3.2	1,181	0.2	78
5	Shade 2	dry cows	150	5.76	11.81	0.78	2.4	864	4.9	1,771	0.3	117
6	Shade 3	small heifers	200	1.67	3.31	0.78	0.9	334	1.8	662	0.4	156
	Post-Project # of Cows (non-expansion)		**1,200**				**25.9**	**9,439**	**57.8**	**21,083**	**2.5**	**935**

*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 2	milk cows	650	10.22	23.29	0.78	18.2	6,643	41.5	15,140	1.4	506
2	Freestall Barn 3	milk cows	1100	10.22	23.29	0.78	30.8	11,242	70.2	25,621	2.3	857
3	Freestall Barn 4	dry cows	250	5.76	11.81	0.78	3.9	1,440	8.1	2,952	0.5	195
4	Freestall Barn 4	medium heifers	800	3.01	4.43	0.78	6.6	2,408	9.7	3,542	1.7	623
5	Freestall Barn 5	medium heifers	1000	3.01	4.43	0.78	8.2	3,010	12.1	4,428	2.1	779
	Total # of Cows From Expansion		**3,800**				**67.7**	**24,743**	**141.6**	**51,683**	**8.0**	**2,960**

*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)
5,000	93.6	34,182	199.4	72,766	10.5	3,895

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	400	137	0
Cow Housing	0	0	-2,892	0	13,472	2,451	0
Liquid Manure	0	0	0	0	3,463	15,843	N/A
Solid Manure	0	0	0	0	699	3,644	0
Feed Handling	0	0	0	0	24,338	0	0
Total	**0**	**0**	**-2,892**	**0**	**42,371**	**22,074**	**N/A**

Total Daily Change in Emissions (lb/day)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	1.1	0.3	0.0
Cow Housing	0.0	0.0	-8.0	0.0	36.6	6.6	0.0
Liquid Manure	0.0	0.0	0.0	0.0	9.4	43.4	N/A
Solid Manure	0.0	0.0	0.0	0.0	2.0	10.0	0.0
Feed Handling	0.0	0.0	0.0	0.0	66.7	0.0	0.0
Total	**0.0**	**0.0**	**-8.0**	**0.0**	**115.8**	**60.3**	**N/A**

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	1,664	0	N/A
Solid Manure	0	0	0	0	0	0	0
Feed Handling	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**1,664**	**0**	**N/A**

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:	Toste Dairy		0	Not Set	
ID#:					
Project #:					

*Notes:

Pre-Project Freestall Barn 4 and Pens 1-6 are located where Post-Project Freestall Barn 3 will be located.

Pre-Project Freestall Barns 2 and 3 are located where Post-Project Freestall Barn 2 will be located.

Preston and Canal Schools were not evaluated

Potential to Emit - Cow Housing

Housing Name(s) or #(s)	Type of Cow	# of Cows	VOC (lb/hr)	VOC (lb/yr)	NH_3 (lb/hr)	NH_3 (lb/yr)	PM_{10} (lb/hr)	PM_{10} (lb/yr)
Freestall Barn 1	Milk	750	-0.0583	0	-1.2917	-11,313	-0.0333	-290
Freestall Barn 2	Milk	650	0.1333	1,203	-0.4625	-4,048	-0.0083	-76
Freestall Barn 3	Milk	1100	0.6833	6,018	1.0500	9,230	-0.4500	-3,949
Freestall Barn 4	Dry & Support Stock	1050	0.4375	3,848	0.7417	6,494	0.0917	818
Freestall Barn 5	Support Stock	1000	0.3417	3,010	0.5042	4,428	0.0875	779
Shade Barn 1	Dry	100	0.0000	0	-0.0875	-763	-0.0042	-39
Shade Barn 2	Dry	150	0.0000	0	-0.1292	-1,145	-0.0083	-58
Shade Barn 3	Support Stock	200	0.0000	0	-0.0500	-432	-0.0083	-77

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	-	-	0.05	400	0.02	137	-
Cow Housing	-0.33	-2,892	1.68	14,722	3.43	30,081	-
Liquid Manure	-	-	0.40	3,463	1.81	15,843	-
Solid Manure	-	-	0.08	699	0.42	3,644	-
Feed Handling	-	-	2.78	24,338	-	-	-
Lagoon/Storage Pond	-	-	0.19	1,643	0.86	7,519	752
Land Application (Liquid)	-	-	0.20	1,789	0.95	8,286	-
Land Application (Solid)	-	-	0.05	402	0.22	1,935	-
Solid Manure Storage	-	-	0.03	256	0.19	1,679	-

SSIPE Total Herd Summary	
Change in Milk Cows	1,000
Change in Dairy Head	2,450
Change in Dairy Head (Flushed)	2,450

PM_{10} 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_{10} rates are known (e.g. Dairy operations). Ammonia and PM_{10} 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:	Toste Dairy
ID#:	0
Project #:	0

Formula

Emission are calculated by the multiplication of the PM_{10} Rates and the Emission Factors.

			Freestall Barn 1		Freestall Barn 2		Freestall Barn 3		Freestall Barn 4		Freestall Barn 5		Shade Barn 1		Shade Barn 2		Shade Barn 3	
			lb/hr	lb/yr	lb/hr	lb/yr	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_{10} Emissions Rates			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.17E-02	8.18E+02	8.75E-02	7.79E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Substances	**CAS#**	**Dust* lb/lb PM_{10}**	**LB/HR**	**LB/YR**	**LB/HR**	**LB/YR**	**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	0.00E+00	0.00E+00	4.27E-03	3.81E+01	4.08E-03	3.63E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	**7440360**	1.90E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-06	1.55E-02	1.66E-06	1.48E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	**7440382**	1.60E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-06	1.31E-02	1.40E-06	1.25E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	**7440393**	4.69E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.30E-05	3.84E-01	4.10E-05	3.65E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine	**7726956**	4.40E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.03E-06	3.60E-02	3.85E-06	3.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	**7440473**	1.40E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-06	1.15E-02	1.23E-06	1.09E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	**7440508**	1.32E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-05	1.08E-01	1.16E-05	1.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium**	**18540299**	7.00E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.42E-08	5.73E-04	6.13E-08	5.45E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	**7439921**	3.50E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.21E-06	2.86E-02	3.06E-06	2.73E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	**7439965**	7.59E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.96E-05	6.21E-01	6.64E-05	5.91E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	**7439976**	4.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.67E-07	3.27E-03	3.50E-07	3.12E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	**7440020**	7.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.42E-07	5.73E-03	6.13E-07	5.45E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phosphorus	**7723140**	4.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.68E-03	3.28E+01	3.51E-03	3.13E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	**7782492**	1.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.17E-08	8.18E-04	8.75E-08	7.79E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sulfates	**9960**	7.28E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.68E-04	5.96E+00	6.37E-04	5.67E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	**7440622**	3.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.75E-06	2.45E-02	2.63E-06	2.34E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	**7440666**	3.42E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.14E-05	2.80E-01	2.99E-05	2.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia	**7664417**		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E+00	9.23E+03	7.42E-01	6.49E+03	5.04E-01	4.43E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Agricultural Miscellaneous Emissions from Dairy Operations (Cow Housing)

Use this spreadsheet to characterize the miscellanous 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:	Toste Dairy
ID#:	0
Project #:	0

Formula

Emissions are calculated by the multiplication of the VOC Rates, and Emission Factors.

			Freestall Barn 1		Freestall Barn 2		Freestall Barn 3		Freestall Barn 4		Freestall Barn 5		Shade Barn 1		Shade Barn 2		Shade Barn 3	
			lb/hr	lb/yr	lb/hr	lb/yr	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**	**1.33E-01**	**1,203.0**	**6.83E-01**	**6,018.0**	**4.38E-01**	**3,848.0**	**3.42E-01**	**3,010.0**	**0.00E+00**	**0.0**	**0.00E+00**	**0.0**	**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**	**LB/HR**	**LB/YR**	**LB/HR**	**LB/YR**
1,1,2,2-Tetrachloroethane	**79345**	8.73E-06	0.00E+00	0.00E+00	1.16E-06	1.05E-02	5.97E-06	5.25E-02	3.82E-06	3.36E-02	2.98E-06	2.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,2-Trichloroethane	**79005**	2.26E-04	0.00E+00	0.00E+00	3.01E-05	2.72E-01	1.54E-04	1.36E+00	9.89E-05	8.70E-01	7.72E-05	6.80E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,3-Trichloropropane	**96184**	2.76E-04	0.00E+00	0.00E+00	3.68E-05	3.32E-01	1.89E-04	1.66E+00	1.21E-04	1.06E+00	9.43E-05	8.31E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2,4-Trichlorobenzene	**120821**	7.79E-04	0.00E+00	0.00E+00	1.04E-04	9.37E-01	5.32E-04	4.69E+00	3.41E-04	3.00E+00	2.66E-04	2.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dibromo-3-chloropropane	**96128**	4.94E-05	0.00E+00	0.00E+00	6.59E-06	5.94E-02	3.38E-05	2.97E-01	2.16E-05	1.90E-01	1.69E-05	1.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichlorobenzene	**95501**	5.48E-04	0.00E+00	0.00E+00	7.31E-05	6.59E-01	3.74E-04	3.30E+00	2.40E-04	2.11E+00	1.87E-04	1.65E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Dichlorobenzene	**541731**	4.90E-04	0.00E+00	0.00E+00	6.53E-05	5.89E-01	3.35E-04	2.95E+00	2.14E-04	1.89E+00	1.67E-04	1.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,4 Dioxane	**123911**	1.41E-03	0.00E+00	0.00E+00	1.88E-04	1.70E+00	9.64E-04	8.49E+00	6.17E-04	5.43E+00	4.82E-04	4.24E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,4-Dichlorobenzene	**106467**	5.19E-04	0.00E+00	0.00E+00	6.92E-05	6.24E-01	3.55E-04	3.12E+00	2.27E-04	2.00E+00	1.77E-04	1.56E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	**75070**	2.41E-03	0.00E+00	0.00E+00	3.21E-04	2.90E+00	1.65E-03	1.45E+01	1.05E-03	9.27E+00	8.23E-04	7.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrylonitrile	**107131**	2.43E-04	0.00E+00	0.00E+00	3.24E-05	2.92E-01	1.66E-04	1.46E+00	1.06E-04	9.35E-01	8.30E-05	7.31E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	**71432**	3.19E-04	0.00E+00	0.00E+00	4.25E-05	3.84E-01	2.18E-04	1.92E+00	1.40E-04	1.23E+00	1.09E-04	9.60E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzyl chloride	**100447**	2.89E-04	0.00E+00	0.00E+00	3.85E-05	3.48E-01	1.97E-04	1.74E+00	1.26E-04	1.11E+00	9.87E-05	8.70E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde	**123728**	1.14E-04	0.00E+00	0.00E+00	1.52E-05	1.37E-01	7.79E-05	6.86E-01	4.99E-05	4.39E-01	3.90E-05	3.43E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon Disulfide	**75150**	2.49E-03	0.00E+00	0.00E+00	3.32E-04	3.00E+00	1.70E-03	1.50E+01	1.09E-03	9.58E+00	8.51E-04	7.49E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon tetrachloride	**56235**	5.87E-05	0.00E+00	0.00E+00	7.83E-06	7.06E-02	4.01E-05	3.53E-01	2.57E-05	2.26E-01	2.01E-05	1.77E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chlorobenzene	**108907**	2.72E-04	0.00E+00	0.00E+00	3.63E-05	3.27E-01	1.86E-04	1.64E+00	1.19E-04	1.05E+00	9.29E-05	8.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroform	**67663**	1.31E-04	0.00E+00	0.00E+00	1.75E-05	1.58E-01	8.95E-05	7.88E-01	5.73E-05	5.04E-01	4.48E-05	3.94E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloromethane	**74873**	7.93E-04	0.00E+00	0.00E+00	1.06E-04	9.54E-01	5.42E-04	4.77E+00	3.47E-04	3.05E+00	2.71E-04	2.39E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crotonaldehyde	**4170303**	1.41E-04	0.00E+00	0.00E+00	1.88E-05	1.70E-01	9.64E-05	8.49E-01	6.17E-05	5.43E-01	4.82E-05	4.24E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cyclohexane	**110827**	6.83E-03	0.00E+00	0.00E+00	9.11E-04	8.22E+00	4.67E-03	4.11E+01	2.99E-03	2.63E+01	2.33E-03	2.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Chloride	**75003**	2.39E-04	0.00E+00	0.00E+00	3.19E-05	2.88E-01	1.63E-04	1.44E+00	1.05E-04	9.20E-01	8.17E-05	7.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	**100414**	3.47E-04	0.00E+00	0.00E+00	4.63E-05	4.17E-01	2.37E-04	2.09E+00	1.52E-04	1.34E+00	1.19E-04	1.04E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylene Dibromide (EDB)	**106934**	3.06E-04	0.00E+00	0.00E+00	4.08E-05	3.68E-01	2.09E-04	1.84E+00	1.34E-04	1.18E+00	1.05E-04	9.21E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylene Dichloride (EDC)	**107062**	5.89E-05	0.00E+00	0.00E+00	7.85E-06	7.09E-02	4.02E-05	3.54E-01	2.58E-05	2.27E-01	2.01E-05	1.77E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	**50000**	3.98E-04	0.00E+00	0.00E+00	5.31E-05	4.79E-01	2.72E-04	2.40E+00	1.74E-04	1.53E+00	1.36E-04	1.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	**110543**	8.12E-04	0.00E+00	0.00E+00	1.08E-04	9.77E-01	5.55E-04	4.89E+00	3.55E-04	3.12E+00	2.77E-04	2.44E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isopropyl Alchol	**67630**	1.62E-03	0.00E+00	0.00E+00	2.16E-04	1.95E+00	1.11E-03	9.75E+00	7.09E-04	6.23E+00	5.54E-04	4.88E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isopropylbenzene (Cumene)	**98828**	5.61E-05	0.00E+00	0.00E+00	7.48E-06	6.75E-02	3.83E-05	3.38E-01	2.45E-05	2.16E-01	1.92E-05	1.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (2-butanone)	**78933**	1.46E-02	0.00E+00	0.00E+00	1.95E-03	1.76E+01	9.98E-03	8.79E+01	6.39E-03	5.62E+01	4.99E-03	4.39E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Isobutyl Ketone	**108101**	7.09E-04	0.00E+00	0.00E+00	9.45E-05	8.53E-01	4.84E-04	4.27E+00	3.10E-04	2.73E+00	2.42E-04	2.13E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Napthalene	**91203**	1.16E-03	0.00E+00	0.00E+00	1.55E-04	1.40E+00	7.93E-04	6.98E+00	5.08E-04	4.46E+00	3.96E-04	3.49E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene	**127184**	6.51E-04	0.00E+00	0.00E+00	8.68E-05	7.83E-01	4.45E-04	3.92E+00	2.85E-04	2.51E+00	2.22E-04	1.96E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Styrene	**100425**	3.59E-04	0.00E+00	0.00E+00	4.79E-05	4.32E-01	2.45E-04	2.16E+00	1.57E-04	1.38E+00	1.23E-04	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
t-1,4-Dichloro-2-butene	**764410**	8.92E-04	0.00E+00	0.00E+00	1.19E-04	1.07E+00	6.10E-04	5.37E+00	3.90E-04	3.43E+00	3.05E-04	2.68E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	**108883**	1.07E-03	0.00E+00	0.00E+00	1.43E-04	1.29E+00	7.31E-04	6.44E+00	4.68E-04	4.12E+00	3.66E-04	3.22E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichlorofluoromethane*	**75694**	1.08E-07	0.00E+00	0.00E+00	1.44E-08	1.30E-04	7.38E-08	6.50E-04	4.73E-08	4.16E-04	3.69E-08	3.25E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl acetate	**108054**	1.97E-03	0.00E+00	0.00E+00	2.63E-04	2.37E+00	1.35E-03	1.19E+01	8.62E-04	7.58E+00	6.73E-04	5.93E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes	**1330207**	1.80E-03	0.00E+00	0.00E+00	2.40E-04	2.17E+00	1.23E-03	1.08E+01	7.88E-04	6.93E+00	6.15E-04	5.42E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Name	Agricultural Miscellaneous Emissions from Dairy Operatio					
Applicability	Use this spreadsheet to characterize the miscellanous emissions from Dairy sources when VOC rates are known. VOC emiss there is more than one Milk Parlor.					
Author or updater	Matthew Cegielski		*Last Update*	August 26, 2016		
Facility:	Toste Dairy					
ID#:	0					
Project #:	0					
More than one Milk Parlor?	N		**Formula**			
Inputs	VOC lb/yr	NH_3 lb/yr	Select N or Y from the dropdown. If there is more than one Milk Parlor, enter VOC and NH_3 rates. Toxic emissions are calculated by the multiplication of the VOC Rates and Emission Factors.			
Milk Parlor 1	0	0				
Milk Parlor 2	0	0	lb/hr	lb/yr	lb/hr	lb/yr
VOC Emission Rates			**4.57E-02**	**4.00E+02**	**0.00E+00**	**0.00E+00**
Substances	**CAS#**	**Toxic EF's (lb/lb VOC)***	**LB/HR**	**LB/YR**	**LB/HR**	**LB/YR**
1,1,2,2-Tetrachloroethane	**79345**	8.73E-06	3.99E-07	3.49E-03	0.00E+00	0.00E+00
1,1,2-Trichloroethane	**79005**	2.26E-04	1.03E-05	9.04E-02	0.00E+00	0.00E+00
1,2,3-Trichloropropane	**96184**	2.76E-04	1.26E-05	1.10E-01	0.00E+00	0.00E+00
1,2,4-Trichlorobenzene	**120821**	7.79E-04	3.56E-05	3.12E-01	0.00E+00	0.00E+00
1,2-Dibromo-3-chloropropane	**96128**	4.94E-05	2.26E-06	1.98E-02	0.00E+00	0.00E+00
1,2-Dichlorobenzene	**95501**	5.48E-04	2.50E-05	2.19E-01	0.00E+00	0.00E+00
1,3-Dichlorobenzene	**541731**	4.90E-04	2.24E-05	1.96E-01	0.00E+00	0.00E+00
1,4 Dioxane	**123911**	1.41E-03	6.44E-05	5.64E-01	0.00E+00	0.00E+00
1,4-Dichlorobenzene	**106467**	5.19E-04	2.37E-05	2.08E-01	0.00E+00	0.00E+00
Acetaldehyde	**75070**	2.41E-03	1.10E-04	9.64E-01	0.00E+00	0.00E+00
Acrylonitrile	**107131**	2.43E-04	1.11E-05	9.72E-02	0.00E+00	0.00E+00
Benzene	**71432**	3.19E-04	1.46E-05	1.28E-01	0.00E+00	0.00E+00
Benzyl chloride	**100447**	2.89E-04	1.32E-05	1.16E-01	0.00E+00	0.00E+00
Butyraldehyde	**123728**	1.14E-04	5.21E-06	4.56E-02	0.00E+00	0.00E+00
Carbon Disulfide	**75150**	2.49E-03	1.14E-04	9.96E-01	0.00E+00	0.00E+00
Carbon tetrachloride	**56235**	5.87E-05	2.68E-06	2.35E-02	0.00E+00	0.00E+00
Chlorobenzene	**108907**	2.72E-04	1.24E-05	1.09E-01	0.00E+00	0.00E+00
Chloroform	**67663**	1.31E-04	5.98E-06	5.24E-02	0.00E+00	0.00E+00
Chloromethane	**74873**	7.93E-04	3.62E-05	3.17E-01	0.00E+00	0.00E+00
Crotonaldehyde	**4170303**	1.41E-04	6.44E-06	5.64E-02	0.00E+00	0.00E+00
Cyclohexane	**110827**	6.83E-03	3.12E-04	2.73E+00	0.00E+00	0.00E+00
Ethyl Chloride	**75003**	2.39E-04	1.09E-05	9.56E-02	0.00E+00	0.00E+00
Ethylbenzene	**100414**	3.47E-04	1.58E-05	1.39E-01	0.00E+00	0.00E+00
Ethylene Dibromide (EDB)	**106934**	3.06E-04	1.40E-05	1.22E-01	0.00E+00	0.00E+00
Ethylene Dichloride (EDC)	**107062**	5.89E-05	2.69E-06	2.36E-02	0.00E+00	0.00E+00
Formaldehyde	**50000**	3.98E-04	1.82E-05	1.59E-01	0.00E+00	0.00E+00
Hexane	**110543**	8.12E-04	3.71E-05	3.25E-01	0.00E+00	0.00E+00
Isopropyl Alchol	**67630**	1.62E-03	7.40E-05	6.48E-01	0.00E+00	0.00E+00
Isopropylbenzene (Cumene)	**98828**	5.61E-05	2.56E-06	2.24E-02	0.00E+00	0.00E+00
Methyl Ethyl Ketone (2-butanone)	**78933**	1.46E-02	6.67E-04	5.84E+00	0.00E+00	0.00E+00
Methyl Isobutyl Ketone	**108101**	7.09E-04	3.24E-05	2.84E-01	0.00E+00	0.00E+00
Napthalene	**91203**	1.16E-03	5.30E-05	4.64E-01	0.00E+00	0.00E+00
Perchloroethylene	**127184**	6.51E-04	2.97E-05	2.60E-01	0.00E+00	0.00E+00
Styrene	**100425**	3.59E-04	1.64E-05	1.44E-01	0.00E+00	0.00E+00
t-1,4-Dichloro-2-butene	**764410**	8.92E-04	4.07E-05	3.57E-01	0.00E+00	0.00E+00
Toluene	**108883**	1.07E-03	4.89E-05	4.28E-01	0.00E+00	0.00E+00
Trichlorofluoromethane*	**75694**	1.08E-07	4.93E-09	4.32E-05	0.00E+00	0.00E+00
Vinyl acetate	**108054**	1.97E-03	9.00E-05	7.88E-01	0.00E+00	0.00E+00
Xylenes	**1330207**	1.80E-03	8.22E-05	7.20E-01	0.00E+00	0.00E+00
Ammonia	**7664417**		1.56E-02	1.37E+02	0.00E+00	0.0

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:	Toste Dairy			
ID#:	0			
Project #:	0			

Inputs	lb/hr	lb/yr	**Formula**
VOC Rate	0	1,643	Emissions are calculated by the multiplication of the VOC rates, area fracton, and emission factors.

			Lagoon Area Fraction		**0.65**		**0.00**		**0.35**	
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	6.45E-03	5.65E+01	4.18E-03	3.66E+01	0.00E+00	0.00E+00	2.27E-03	1.98E+01
1,1,2-Trichloroethane	**79005**	7.94E-03	1.49E-03	1.30E+01	9.65E-04	8.45E+00	0.00E+00	0.00E+00	5.23E-04	4.58E+00
1,2,4-Trimethylbenzene	**95636**	2.94E-02	5.51E-03	4.82E+01	3.57E-03	3.13E+01	0.00E+00	0.00E+00	1.94E-03	1.70E+01
1,2-Dichlorobenzene	**95501**	6.25E-02	1.17E-02	1.03E+02	7.60E-03	6.66E+01	0.00E+00	0.00E+00	4.12E-03	3.61E+01
1,3-Dichlorobenzene	**541731**	4.94E-02	9.26E-03	8.11E+01	6.00E-03	5.26E+01	0.00E+00	0.00E+00	3.25E-03	2.85E+01
1,3-Dichloropropene	**542756**	7.44E-03	1.39E-03	1.22E+01	9.04E-04	7.92E+00	0.00E+00	0.00E+00	4.90E-04	4.29E+00
1,4 Dioxane	**123911**	2.50E-02	4.69E-03	4.11E+01	3.04E-03	2.66E+01	0.00E+00	0.00E+00	1.65E-03	1.44E+01
1,4-Dichloro-2-butene	**764410**	6.88E-02	1.29E-02	1.13E+02	8.36E-03	7.32E+01	0.00E+00	0.00E+00	4.53E-03	3.97E+01
1,4-Dichlorobenzene	**106467**	5.19E-02	9.73E-03	8.52E+01	6.31E-03	5.53E+01	0.00E+00	0.00E+00	3.42E-03	2.99E+01
Acetaldehyde	**75070**	1.56E-02	2.93E-03	2.57E+01	1.90E-03	1.66E+01	0.00E+00	0.00E+00	1.03E-03	9.02E+00
Acrylonitrile	**107131**	7.31E-03	1.37E-03	1.20E+01	8.89E-04	7.79E+00	0.00E+00	0.00E+00	4.82E-04	4.22E+00
Benzene	**71432**	2.88E-03	5.39E-04	4.72E+00	3.50E-04	3.06E+00	0.00E+00	0.00E+00	1.89E-04	1.66E+00
Benzyl chloride	**100447**	3.13E-02	5.86E-03	5.13E+01	3.80E-03	3.33E+01	0.00E+00	0.00E+00	2.06E-03	1.80E+01
Carbon disulfide	**75150**	3.94E-02	7.38E-03	6.47E+01	4.79E-03	4.19E+01	0.00E+00	0.00E+00	2.60E-03	2.27E+01
Chlorobenzene	**108907**	1.31E-02	2.46E-03	2.16E+01	1.60E-03	1.40E+01	0.00E+00	0.00E+00	8.65E-04	7.58E+00
Cumene	**98828**	1.94E-02	3.63E-03	3.18E+01	2.36E-03	2.06E+01	0.00E+00	0.00E+00	1.28E-03	1.12E+01
Cyclohexane	**110827**	8.19E-03	1.54E-03	1.34E+01	9.96E-04	8.72E+00	0.00E+00	0.00E+00	5.40E-04	4.73E+00
Ethyl Chloride	**75003**	4.63E-03	8.67E-04	7.60E+00	5.62E-04	4.93E+00	0.00E+00	0.00E+00	3.05E-04	2.67E+00
Ethylbenzene	**100414**	1.00E-02	1.88E-03	1.64E+01	1.22E-03	1.07E+01	0.00E+00	0.00E+00	6.59E-04	5.77E+00
Ethylene Dibromide (EDB)	**106934**	1.44E-02	2.70E-03	2.36E+01	1.75E-03	1.53E+01	0.00E+00	0.00E+00	9.47E-04	8.30E+00
Ethylene Dichloride (EDC)	**107062**	4.06E-03	7.62E-04	6.67E+00	4.94E-04	4.33E+00	0.00E+00	0.00E+00	2.68E-04	2.35E+00
Formaldehyde	**50000**	8.13E-03	1.52E-03	1.33E+01	9.88E-04	8.65E+00	0.00E+00	0.00E+00	5.35E-04	4.69E+00
Hexane	**110543**	4.31E-03	8.09E-04	7.08E+00	5.24E-04	4.59E+00	0.00E+00	0.00E+00	2.84E-04	2.49E+00
Isopropyl Alchol	**67630**	7.50E-03	1.41E-03	1.23E+01	9.12E-04	7.99E+00	0.00E+00	0.00E+00	4.94E-04	4.33E+00
Methyl Ethyl Ketone	**78933**	1.38E-02	2.58E-03	2.26E+01	1.67E-03	1.46E+01	0.00E+00	0.00E+00	9.06E-04	7.94E+00
Methyl Isobutyl Ketone	**108101**	1.13E-02	2.12E-03	1.86E+01	1.38E-03	1.20E+01	0.00E+00	0.00E+00	7.46E-04	6.53E+00
Napthalene	**91203**	1.88E-01	3.52E-02	3.08E+02	2.28E-02	2.00E+02	0.00E+00	0.00E+00	1.24E-02	1.08E+02
Perchloroethylene	**127184**	1.75E-01	3.28E-02	2.87E+02	2.13E-02	1.86E+02	0.00E+00	0.00E+00	1.15E-02	1.01E+02
Styrene	**100425**	1.63E-02	3.05E-03	2.67E+01	1.98E-03	1.73E+01	0.00E+00	0.00E+00	1.07E-03	9.38E+00
Toluene	**108883**	1.25E-02	2.34E-03	2.05E+01	1.52E-03	1.33E+01	0.00E+00	0.00E+00	8.24E-04	7.22E+00
Trichloroethylene	**79016**	1.12E-02	2.10E-03	1.84E+01	1.36E-03	1.19E+01	0.00E+00	0.00E+00	7.37E-04	6.46E+00
Xylenes	**1330207**	1.88E-02	3.52E-03	3.08E+01	2.28E-03	2.00E+01	0.00E+00	0.00E+00	1.24E-03	1.08E+01
Ammonia	**7664417**				5.566E-01	4.876E+03	0.000E+00	0.000E+00	3.017E-01	2.643E+03

Toste Barns 2-3 Construction DPM

Merced County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	221.00	1000sqft	5.07	221,000.00	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/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - 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, gradinging 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 -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	230.00	117.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	PhaseEndDate	6/29/2021	12/31/2020
tblConstructionPhase	PhaseEndDate	8/11/2020	7/21/2020
tblConstructionPhase	PhaseEndDate	7/14/2020	7/7/2020
tblConstructionPhase	PhaseStartDate	8/12/2020	7/22/2020
tblConstructionPhase	PhaseStartDate	7/15/2020	7/8/2020
tblGrading	AcresOfGrading	5.00	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020						0.0790	0.2178									
Maximum						**0.0790**	**0.2178**									

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						0.0790	0.2178									
Maximum						**0.0790**	**0.2178**									

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

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area						1.0000e-005	1.0000e-005									
Energy						0.0172	0.0172									
Mobile						0.0281	1.3295									
Waste						0.0000	0.0000									
Water						0.0000	0.0000									
Total						**0.0453**	**1.3467**									

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						0.0172	0.0172									
Mobile						0.0281	1.3295									
Waste						0.0000	0.0000									
Water						0.0000	0.0000									
Total						**0.0453**	**1.3467**									

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/1/2020	7/7/2020	5	5	
2	Grading	Grading	7/8/2020	7/21/2020	5	10	
3	Building Construction	Building Construction	7/22/2020	12/31/2020	5	117	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

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	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	93.00	36.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust						0.0000	0.0452									
Off-Road						5.4900e-003	5.4900e-003									
Total						**5.4900e-003**	**0.0507**									

3.2 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling						0.0000	0.0000									
Vendor						0.0000	0.0000									
Worker						0.0000	3.6000e-004									
Total						**0.0000**	**3.6000e-004**									

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust						0.0000	0.0452									
Off-Road						5.4900e-003	5.4900e-003									
Total						**5.4900e-003**	**0.0507**									

3.2 Site Preparation - 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	3.6000e-004									
Total						**0.0000**	**3.6000e-004**									

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust						0.0000	0.0354									
Off-Road						6.3700e-003	6.3700e-003									
Total						**6.3700e-003**	**0.0418**									

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling						0.0000	0.0000									
Vendor						0.0000	0.0000									
Worker						0.0000	6.0000e-004									
Total						**0.0000**	**6.0000e-004**									

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust						0.0000	0.0354									
Off-Road						6.3700e-003	6.3700e-003									
Total						**6.3700e-003**	**0.0418**									

3.3 Grading - 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	6.0000e-004									
Total						**0.0000**	**6.0000e-004**									

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road						0.0654	0.0654									
Total						**0.0654**	**0.0654**									

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling						0.0000	0.0000									
Vendor						1.3900e-003	0.0153									
Worker						3.4000e-004	0.0437									
Total						**1.7300e-003**	**0.0591**									

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road						0.0654	0.0654									
Total						**0.0654**	**0.0654**									

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						1.3900e-003	0.0153									
Worker						3.4000e-004	0.0437									
Total						**1.7300e-003**	**0.0591**									

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated						0.0281	1.3295									
Unmitigated						0.0281	1.3295									

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	1,540.37	291.72	150.28	3,396,580	3,396,580
Total	1,540.37	291.72	150.28	3,396,580	3,396,580

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
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

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000									
Electricity Unmitigated						0.0000	0.0000									
NaturalGas Mitigated						0.0172	0.0172									
NaturalGas Unmitigated						0.0172	0.0172									

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.61227e+006						0.0172	0.0172									
Total							**0.0172**	**0.0172**									

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	4.61227e+006						0.0172	0.0172									
Total							**0.0172**	**0.0172**									

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.94922e+006				
Total					

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.94922e+006				
Total					

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated						1.0000e-005	1.0000e-005									
Unmitigated						1.0000e-005	1.0000e-005									

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									
Total						**1.0000e-005**	**1.0000e-005**									

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									
Total						**1.0000e-005**	**1.0000e-005**									

7.0 Water Detail

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	51.1063 / 0				
Total					

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	51.1063 / 0				
Total					

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				
Unmitigated				

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	274.04				
Total					

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	274.04				
Total					

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Toste Barns 4-5 Construction DPM

Merced County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	147.00	1000sqft	3.37	147,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	3			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - 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, gradinging 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 -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	230.00	73.00
tblConstructionPhase	PhaseEndDate	12/7/2021	4/30/2021

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021						0.0452	0.1412									
Maximum						**0.0452**	**0.1412**									

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					
2021						0.0452	0.1412									
Maximum						**0.0452**	**0.1412**									

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

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area						0.0000	0.0000									
Energy						0.0114	0.0114									
Mobile						0.0159	0.8814									
Waste						0.0000	0.0000									
Water						0.0000	0.0000									
Total						**0.0273**	**0.8928**									

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						0.0114	0.0114									
Mobile						0.0159	0.8814									
Waste						0.0000	0.0000									
Water						0.0000	0.0000									
Total						**0.0273**	**0.8928**									

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2021	1/7/2021	5	5	
2	Grading	Grading	1/8/2021	1/19/2021	5	8	
3	Building Construction	Building Construction	1/20/2021	4/30/2021	5	73	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

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	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	62.00	24.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust						0.0000	0.0452									
Off-Road						5.1100e-003	5.1100e-003									
Total						**5.1100e-003**	**0.0503**									

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling						0.0000	0.0000									
Vendor						0.0000	0.0000									
Worker						0.0000	3.6000e-004									
Total						**0.0000**	**3.6000e-004**									

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust						0.0000	0.0452									
Off-Road						5.1100e-003	5.1100e-003									
Total						**5.1100e-003**	**0.0503**									

3.2 Site Preparation - 2021

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	3.6000e-004									
Total						**0.0000**	**3.6000e-004**									

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust						0.0000	0.0262									
Off-Road						4.6400e-003	4.6400e-003									
Total						**4.6400e-003**	**0.0309**									

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling						0.0000	0.0000									
Vendor						0.0000	0.0000									
Worker						0.0000	4.8000e-004									
Total						**0.0000**	**4.8000e-004**									

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust						0.0000	0.0262									
Off-Road						4.6400e-003	4.6400e-003									
Total						**4.6400e-003**	**0.0309**									

3.3 Grading - 2021

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	4.8000e-004									
Total						**0.0000**	**4.8000e-004**									

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road						0.0350	0.0350									
Total						**0.0350**	**0.0350**									

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling						0.0000	0.0000									
Vendor						3.0000e-004	6.1000e-003									
Worker						1.4000e-004	0.0182									
Total						**4.4000e-004**	**0.0243**									

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road						0.0350	0.0350									
Total						**0.0350**	**0.0350**									

3.4 Building Construction - 2021

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						3.0000e-004	6.1000e-003									
Worker						1.4000e-004	0.0182									
Total						**4.4000e-004**	**0.0243**									

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated						0.0159	0.8814									
Unmitigated						0.0159	0.8814									

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	1,024.59	194.04	99.96	2,259,264	2,259,264
Total	1,024.59	194.04	99.96	2,259,264	2,259,264

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
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	0.492060	0.030872	0.155167	0.115051	0.019669	0.004846	0.015607	0.153483	0.002388	0.002252	0.006351	0.001584	0.000670

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000									
Electricity Unmitigated						0.0000	0.0000									
NaturalGas Mitigated						0.0114	0.0114									
NaturalGas Unmitigated						0.0114	0.0114									

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	3.06789e+006						0.0114	0.0114									
Total							**0.0114**	**0.0114**									

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	3.06789e+006						0.0114	0.0114									
Total							**0.0114**	**0.0114**									

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.29654e+006				
Total					

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.29654e+006				
Total					

6.0 Area Detail

6.1 Mitigation Measures Area

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

6.2 Area by SubCategory

Unmitigated

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

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									
Total						**0.0000**	**0.0000**									

7.0 Water Detail

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	33.9937 / 0				
Total					

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	33.9937 / 0				
Total					

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				
Unmitigated				

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	182.28				
Total					

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	182.28				
Total					

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B: AERMOD ELECTRONIC FILES

AMBIENT AIR QUALITY ANALYSIS
Toste Dairy Expansion

609 Santa Fe Grade
Newman, CA 95360
Merced County

Prepared By:

Matt Daniel – Senior Consultant

INSIGHT ENVIRONMENTAL CONSULTANTS, INC.
5500 Ming Avenue, Suite 140
Bakersfield, CA 93309
661-282-2200

May 2020

Project 190505.0265

Insight Environmental Consultants | Trinity Consultants

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. EXECUTIVE SUMMARY

This document contains the ambient air quality analysis (AAQA) performed on behalf of Environmental Planning Partners, Inc. for an expansion of the existing Toste Dairy operation in Merced County, California. The intent of the AAQA is to determine if the proposed dairy 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_2), and sulfur dioxide (SO_2); and attainment for particulate matter between 2.5 and 10 micrometers in diameter (PM_{10}). The Merced County portions of the San Joaquin Valley Air Basin have been designated as non-attainment/extreme for the ozone (O_3) eight-hour average standard and non-attainment for the particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$) 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_3; non-attainment for the PM_{10}, $PM_{2.5}$ and eight-hour O_3 standards; unclassified for hydrogen sulfide (H_2S) 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_{10} and $PM_{2.5}$. 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 Toste Dairy expansion project, maximum predicted concentrations of NO_2, SO_2, CO, PM_{10}, $PM_{2.5}$ and H_2S 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_2, SO_2, CO, or H_2S, or cause an increment violation of the SJVAPCD SILs for the annual and 24-hour averaging periods for PM_{10} and $PM_{2.5}$.

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

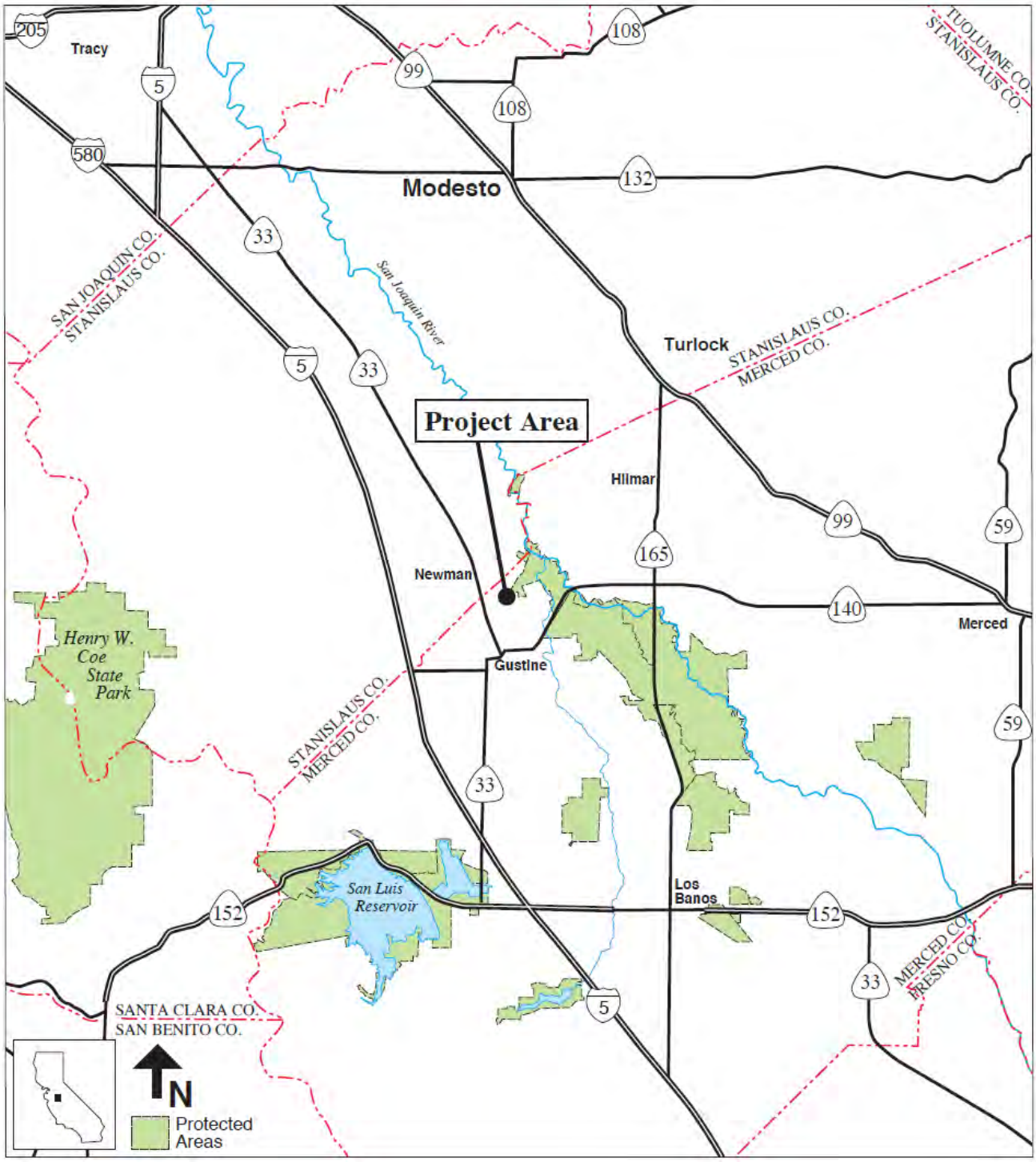
This Ambient Air Quality Analysis (AAQA) is provided as a service of Insight Environmental Consultants, Inc., a Trinity Consultants company performed on behalf of Environmental Planning Partners, Inc. for an expansion of the existing Toste Dairy operation in Merced County, California (**Figure 2-1**). 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_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter between 2.5 and 10 micrometers in diameter (PM_{10}), particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), and hydrogen sulfide (H_2S). 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 dairy is located at 609 Santa Fe Grade in Newman, 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 dairy will house approximately 5,000 head of cattle. The existing and proposed herd configuration is provided in Table 2-1. The dairy will continue to operate 24 hours per day and 365 days per year.

Table 2-1. Herd Configuration – Existing and Proposed

	Current	Proposed	Increment
Milk Cows	1,500	2,500	1,000
Dry Cows	450	500	50
Bred Heifers 15-24 mos.	0	0	0
Heifers 7-14 mos.	400	1,800	1,400
Heifers 4-6 mos.	200	200	0
Calves 0-3 mos.	0	0	0
Bulls	0	0	0
TOTAL	**2,550**	**5,000**	**2,450**

The proposed structure construction would consist of four new animal structures. The proposed expansion would include construction of 368,000 square feet of new buildings.

3. BACKGROUND OF AIR QUALITY STANDARDS

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_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$) 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_2S), vinyl chloride (chloroethene) and visibility reducing particles. In 2010, the U.S. Environmental Protection Agency (EPA) promulgated a new 1-hour NO_2 and SO_2 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_2, and SO_2; and attainment for PM_{10}. The project location has been designated as non-attainment/extreme for the O_3 eight-hour average standard and non-attainment for the $PM_{2.5}$ standard. A Federal designation for lead has not been made and NAAQS do not exist for O_3 (1-hour average), hydrogen sulfide (H_2S), 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_3, non-attainment for the PM_{10}, $PM_{2.5}$, and eight-hour O_3 standards; unclassified for H_2S 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_3	8-Hour	0.070 ppm (137 µg/m³) [c]	0.070 ppm (137 µg/m³)
	1-Hour	[a]	0.09 ppm (180 µg/m³)
CO	8-Hour	9 ppm (10 mg/m³)	9 ppm (10 mg/m³)
	1-Hour	35 ppm (40 mg/m³)	20 ppm (23 mg/m³)
NO_2	Annual Average	53 ppb (100 µg/m³)	0.030 ppm (56 µg/m³)
	1-Hour	100 ppb (188.68 µg/m³)	0.18 ppm (338 µg/m³)
SO_2	3-Hour	0.5 ppm (1,300 µg/m³)	
	24 Hour	0.14 ppm (365 µg/m³)	0.04 ppm (105 µg/m³)
	1-Hour	75 ppb (196 µg/m³)	0.25 ppm (655 µg/m³)
Particulate Matter (PM10)	Annual Arithmetic Mean	[b]	20 µg/m³
	24-Hour	150 µg/m³	50 µg/m³
Fine Particulate Matter (PM2.5)	Annual Arithmetic Mean	12 µg/m³	12 µg/m³
	24-Hour	35 µg/m³	
Sulfates	24-Hour		25 µg/m³
Pb [d]	Rolling Three-Month Average	0.15 µg/m³	
	30 Day Average		1.5 µg/m³
H_2S	1-Hour		0.03 ppm (42 µg/m³)
Vinyl Chloride (chloroethene)	24-Hour		0.010 ppm (26 µg/m³)
Visibility Reducing particles	8 Hour (1000 to 1800 PST)		[e]

ppm = parts per million
ppb = parts per billion
mg/m3 = milligrams per cubic meter
µg/m ³= micrograms per cubic meter

[a] 1-Hour O_3 standard revoked effective June 15, 2005.

[b] Annual PM 10 standard revoked effective December 18, 2006.

[c] EPA finalized the revised (2008) 8-hour O_3 standard of 0.075 ppm on March 27, 2008. The 1997 8-hour O_3 standard of 0.08 ppm has not been revoked. In the January 19, 2010 Federal Register, EPA proposed to revise the 2008 O_3 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.

[d] On October 15, 2008, EPA strengthened the Pb standard.

[e] 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[a]	CAAQS[b]
O_3, 1-hour	No Federal Standard[f]	Nonattainment/Severe
O_3, 8-hour	Nonattainment/Extreme[e]	Nonattainment
PM_{10}	Attainment[c]	Nonattainment
$PM_{2.5}$	Nonattainment[d]	Nonattainment
CO	Attainment/Unclassified	Attainment/Unclassified
NO_2	Attainment/Unclassified	Attainment
SO_2	Attainment/Unclassified	Attainment
Pb (Particulate)	No Designation/Classification	Attainment
H_2S	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing particulates	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

[a] See 40 CFR Part 81

[b] See CCR Title 17 Sections 60200-60210

[c] On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 National Ambient Air Quality Standard (NAAQS) and approved the PM10 Maintenance Plan.

[d] The Valley is designated nonattainment for the 1997 PM2.5 NAAQS. EPA designated the Valley as nonattainment for the 2006 PM2.5 NAAQS on November 13, 2009 (effective December 14, 2009).

[e] Though the Valley was initially classified as serious nonattainment for the 1997 8-hour O_3 standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

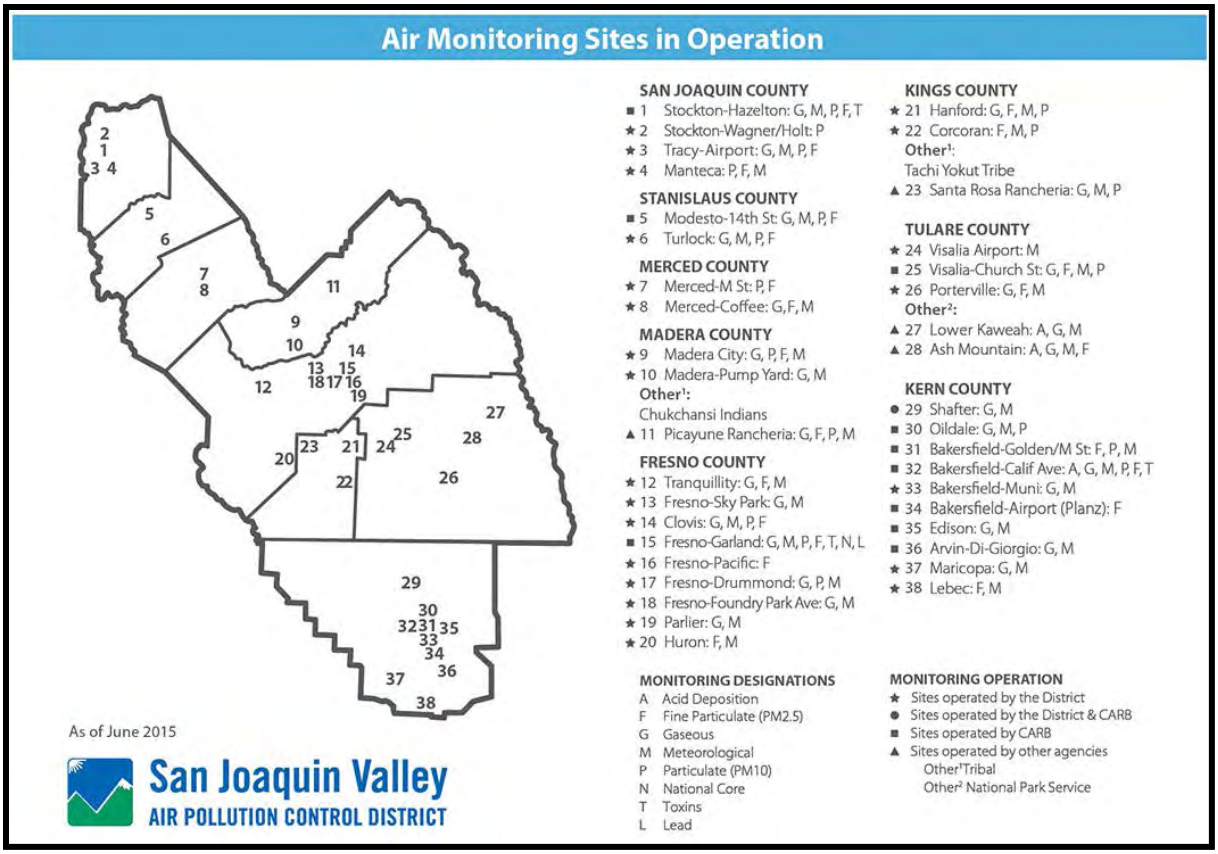
[f] Effective June 15, 2005, the EPA revoked the federal 1-hour O_3 standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour O_3 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[1] 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.

[1] The exception is the one-hour NO_2 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/m³	Reference
NO_2	1-hour	83.5	SJVACPD FTP Server, Merced Co. (SJVAPCD 2017c)
	Annual	14.2	Merced County, 2018 (CARB 2019)
SO_2	1-hour	20.3	Fresno Co., 2018 (USEPA 2019)
	3-hour	18.3	Scaled from SO_2 1-hour concentration[2]
	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)
$PM_{2.5}$	24-hour	88.2	Merced County, 2018 (CARB 2019)
	Annual	15.1	Merced County, 2018 (CARB 2019)
PM_{10}	24-hour	142.7	Merced County, 2018 (CARB 2019)
	Annual	34.6	Merced County, 2018 (CARB 2019)

1 The District processed the NO_2 monitoring data using the guidance provided in Appendix S of Part 50.
2 The SO_2 3-hour Concentration was scaled from the SO_2 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[2] 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.

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

This section describes the methodology used to predict the potential impact to ambient air quality attributable to the dispersion of emissions of NO_2, SO_2, CO, PM_{10}, $PM_{2.5}$ and H_2S from the proposed dairy 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 dairy are considered to be existing emissions.[3] Based on this fact, the facility's existing emissions are not included in the emissions proposed by the subject project. Therefore, emissions from the dairy 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
MTI, MTT	Milk Truck Idling and Travel
CTI, CTT	Commodity Truck Idling and Travel
SRTI, SRTT	Solids Removal Truck Idling and Travel
FLT	Feed Loading
MLT	Solids Removal (Loader)
FBTD1-3	Feed and Bedding Delivery
MS1-3	Manure Scraping
FSB4-5	New Freestall Barns
LAGOON3	Lagoons

Emissions attributable to animal movement were estimated by the SJVAPCD using spreadsheets developed by the SJVAPCD to calculate dairy 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_{10} emission factors. To generate $PM_{2.5}$ emissions, the PM_{10} emission results for these emission sources were multiplied by the $PM_{2.5}$ 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_{10} and $PM_{2.5}$ emissions for 24-hour and annual periods are summarized in **Table 4-2**.

[3] Personal Communication with Leland Villalvazo, SJVAPCD, June 15, 2007.

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

Source ID	PM_{10} Emissions		$PM_{2.5}$ Emissions	
	Lbs/yr	Lbs/24-hr	Lbs/yr	Lbs/24-hr
FSB4	818	2.2	93	0.25
FSB5	779	2.1	89	0.24

On-site mobile sources for this facility include a diesel-fueled feed loading tractor, a manure loading tractor, manure scraping tractor, a feed delivery tractor, a bedding delivery tractor, milk tankers, solids removal trucks and commodity delivery trucks. The increased herd size will require additional usage and trips for all tractors and 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 $PM_{2.5}$ were set equal to PM_{10} 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 Toste Dairy, 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 Toste Dairy Expansion Project does not propose any new pieces of equipment and the 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 in regard to 1-hour periods is zero. Based on the same philosophy outlined above for 1-hour emissions there will not be an increase no max 3-hour emissions increases.

However, the Project will result in some emissions potentially moving closer to receptors. Feed delivery, bedding delivery and manure scraping tractors will operate closer to some receptors, therefore, hourly emissions from these sources require analysis for 1-hour AAQS. Based on the same philosophy outlined above for 1-hour emissions; max 3-hour emissions from feed delivery, bedding delivery and scraping 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_2 Emissions		SO_2 Emissions		CO Emissions		$PM_{10}/PM_{2.5}$ Emissions	
	Lbs/hr	Lbs/yr	Lbs/hr	Lbs/day	Lbs/hr	Lbs/8-hr	Lbs/24-hr	Lbs/yr
MTT	0.00E+00	2.90E+01	0.00E+00	7.00E-05	0.00E+00	3.44E-02	4.87E-03	1.77E+00
CTT	0.00E+00	2.32E+01	0.00E+00	5.61E-05	0.00E+00	2.76E-02	3.90E-03	1.42E+00
SRTT	0.00E+00	2.82E+01	0.00E+00	9.55E-05	0.00E+00	4.70E-02	6.64E-03	1.73E+00
MTI	0.00E+00	9.84E+00	0.00E+00	1.82E-05	0.00E+00	1.32E-02	5.02E-04	1.83E-01
CTI	0.00E+00	4.92E+00	0.00E+00	9.12E-06	0.00E+00	6.59E-03	2.51E-04	9.13E-02
SRTI	0.00E+00	1.05E+01	0.00E+00	2.74E-05	0.00E+00	1.98E-02	7.53E-04	1.96E-01
FLT	0.00E+00	1.883E+0	0.00E+00	8.65E-04	0.00E+00	6.45E-01	2.58E-03	9.41E-01
FBTD1	3.41E-02	2.64E+01	5.72E-04	1.59E-03	4.27E-01	7.56E-01	4.74E-03	1.32E+00
FBTD2	2.02E-02	1.56E+01	3.38E-04	9.38E-04	2.52E-01	4.46E-01	2.80E-03	7.79E-01
FBTD3	1.36E-02	1.05E+01	2.28E-04	6.31E-04	1.70E-01	3.01E-01	1.88E-03	5.24E-01
MS1	1.17E-02	1.87E-01	1.96E-04	7.82E-04	1.46E-01	5.83E-01	2.33E-03	9.33E-03
MS2	1.53E-02	2.44E-01	2.56E-04	1.02E-03	1.91E-01	7.63E-01	3.05E-03	1.22E-02
MS3	6.89E-03	1.10E-01	1.15E-04	4.62E-04	8.61E-02	3.44E-01	1.38E-03	5.51E-03
MLT	0.00E+00	5.06E+00	0.00E+00	2.32E-04	0.00E+00	1.73E-01	6.93E-04	2.53E-01

The new lagoon's H_2S emissions were assumed to be 10% of the NH3 lagoon emissions. This assumption was taken from the SJVAPCD's dairy calculator. The new lagoons calculated H_2S emissions are 752 lbs/year.

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 dairy 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 and scraping 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, milk trucks, solids 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 feed loading tractor, manure loading tractor, milk truck idling, solids 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[4]

[4] Provided via website, San Joaquin Valley Air Pollution Control District (SJVAPCD), ftp://12.219.204.27/public/Modeling/Meteorological_Data/AERMET_v16216/Modesto_23258/

was input into AERMOD. This was the most recent available dataset available at the time the modeling runs were conducted.

4.2.2. Receptors

Existing land uses in the area where the dairy 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. One tier was specified extending a distance of 100 meters from the fenceline with 25 meter spacing. The spacing between receptors perpendicular to the fenceline was set to 25 meters. A total of 748 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_2, SO_2, CO and H_2S.

Compliance with the Federal NO_2 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_2 one-hour standard.

Table 4-4. Predicted Ambient Air Quality Impacts

Pollutant	Averaging Period	Background ($\mu g/m^3$)	Project ($\mu g/m^3$)	Project + Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)
NO_2	1-hour	83.5	6.29	89.79	188.68	339
	Annual	14.2	0.07	14.27	100	---
SO_2	1-hour	20.3	0.19	20.5	195	655
	3-hour	18.3	0.10	18.4	1300	---
	24-hour	7.3	0.00	7.30	---	105
CO	1-hour	3330	139.12	3469	40,000	23,000
	8-hour	2950	21.18	2971	10,000	10,000
PM_{10}	24-hour	142.70	4.84	147.54	150	50
	Annual	34.60	0.58	35.18	50	20
$PM_{2.5}$	24-hour	88.20	0.31	88.51	35	---
	Annual	15.10	0.07	15.17	12	12
H_2S	1-hour	N/A	13.7	13.7	---	42

Background 24-hour and annual concentrations of PM_{10} and $PM_{2.5}$ exceed their respective ambient air quality standards. Therefore, these averaging periods for $PM_{2.5}$ and PM_{10} 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_{10} and $PM_{2.5}$.[5] As shown in **Tables 4-2** and **4-3**, 99% of the project's predicted PM_{10} concentration is attributable to fugitive PM_{10} 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_{10} and $PM_{2.5}$ impacts directly attributable to the project are below the applicable SJVAPCD significance levels for the 24-hour and annual averaging periods of PM_{10} and $PM_{2.5}$ 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 ($\mu g/m^3$)	SJVAPCD SIL ($\mu g/m^3$)
PM_{10}	24-hour	4.84	10.4
	Annual	0.58	2.08
$PM_{2.5}$	24-hour	0.31	2.5
	Annual	0.07	0.63

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

[5] Personal Communication with Yu Vu, San Joaquin Valley Air Pollution Control District, August 15, 2012

5. CONCLUSIONS

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_2, SO_2, CO, or H2S or cause an increment violation of the SJVAPCD SILs for PM_{10} and $PM_{2.5}$.

6. REFERENCES

Auer, Jr., A.H., 1978. Correlation of Land Use and Cover with Meteorological Anomalies. Journal of Applied Meteorology, 17(5): 636-643, 1978.

California Air Pollution Control Officers Association (CAPCOA). 2013. California Emissions Estimator Model tm (CalEEMod), version 2013.2.2, released October 2013. Available online at: http://caleemod.com/

California Environmental Quality Act, *Appendix G – Environmental Checklist Form, Final Text.* October 26, 1998.

California Air Resources Board. CARB. 2017a. Ambient Air Quality Standards, Accessed July 2017. <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>

CARB. 2017b. iADAM Air Quality Data Statistics, Accessed July 2017. <http://www.arb.ca.gov/adam/index.html>

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines, Appendix H, Accessed July 2017. <http://www.oehha.ca.gov/air/hot_spots/2015/2015GMAppendicesG_J.pdf>

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2000. *Environmental Review Guidelines Procedures for Implementing the California Environmental Quality Act*. August 2000.

----------. 2010. *Modeling Procedures to Address the New Federal 1 Hour NO_2 Standard (Revision 1.0)*. April 12, 2010.

----------. 2012. *Dairy H_2S AERMOD Hourly Emission File Generator, Version 1.0.* September 2012.

----------. 2015. Guide for Assessing and Mitigating Air Quality Impacts. March 19, 2015.

----------. 2017a. Ambient Air Quality Standards and Valley Attainment Status, Accessed July 2017. <http://www.valleyair.org/aqinfo/attainment.htm>

----------. 2017b. Air Monitoring Sites in Operation, Accessed July 2017. <http://www.valleyair.org/aqinfo/MonitoringSites.htm>

----------. 2017c. NO2 3 Year Max Data, Accessed July 2017. <ftp://12.219.204.27/public/Modeling/Monitoring_Data/3yr_Max_NO2_Values>

SCAQMD. 2006. Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM2.5 Significance Thresholds. October 2006. <http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/particulate-matter-(pm)-2.5-significance-thresholds-and-calculation-methodology/final_pm2_5methodology.pdf?sfvrsn=2

United States Environmental Protection Agency. 2019. AirData, Monitor Values Report, Accessed December 2019. <http://www.epa.gov/airquality/airdata/ad_rep_mon.html>

APPENDIX A: FUGITIVE EMISSION ESTIMATION WORKSHEETS

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:	Toste Dairy		0	Not Set	
ID#:					
Project #:					

*Notes:

Pre-Project Freestall Barn 4 and Pens 1-6 are located where Post-Project Freestall Barn 3 will be located.

Pre-Project Freestall Barns 2 and 3 are located where Post-Project Freestall Barn 2 will be located.

Preston and Canal Schools were not evaluated

Potential to Emit - Cow Housing

Housing Name(s) or #(s)	Type of Cow	# of Cows	VOC (lb/hr)	VOC (lb/yr)	NH_3 (lb/hr)	NH_3 (lb/yr)	PM_{10} (lb/hr)	PM_{10} (lb/yr)
Freestall Barn 1	Milk	750	-0.0583	0	-1.2917	-11,313	-0.0333	-290
Freestall Barn 2	Milk	650	0.1333	1,203	-0.4625	-4,048	-0.0083	-76
Freestall Barn 3	Milk	1100	0.6833	6,018	1.0500	9,230	-0.4500	-3,949
Freestall Barn 4	Dry & Support Stock	1050	0.4375	3,848	0.7417	6,494	0.0917	818
Freestall Barn 5	Support Stock	1000	0.3417	3,010	0.5042	4,428	0.0875	779
Shade Barn 1	Dry	100	0.0000	0	-0.0875	-763	-0.0042	-39
Shade Barn 2	Dry	150	0.0000	0	-0.1292	-1,145	-0.0083	-58
Shade Barn 3	Support Stock	200	0.0000	0	-0.0500	-432	-0.0083	-77

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	-	-	0.05	400	0.02	137	-
Cow Housing	-0.33	-2,892	1.68	14,722	3.43	30,081	-
Liquid Manure	-	-	0.40	3,463	1.81	15,843	-
Solid Manure	-	-	0.08	699	0.42	3,644	-
Feed Handling	-	-	2.78	24,338	-	-	-
Lagoon/Storage Pond	-	-	0.19	1,643	0.86	7,519	752
Land Application (Liquid)	-	-	0.20	1,789	0.95	8,286	-
Land Application (Solid)	-	-	0.05	402	0.22	1,935	-
Solid Manure Storage	-	-	0.03	256	0.19	1,679	-

SSIPE Total Herd Summary	
Change in Milk Cows	1,000
Change in Dairy Head	2,450
Change in Dairy Head (Flushed)	2,450

Rev. May 7, 2019

Pre-Project Facility Information

1. Does this facility house Holstein or Jersey cows? Holstein
   Most facilities house Holstein cows unless explicitly stated on the PTO or application.
2. Does the facility have an anaerobic treatment lagoon? no
3. Does the facility land apply liquid manure? yes
   Answering "yes" assumes worst case.
4. Does the facility land apply solid manure? yes
   Answering "yes" assumes worst case.
5. Is any scraped manure sent to a lagoon/storage pond? yes
   Answering "yes" assumes worst case.

Pre-Project Herd Size

Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals
Milk Cows	1,500				1,500
Dry Cows			450		450
Support Stock (Heifers, Calves, and Bulls)					0
Large Heifers					0
Medium Heifers			400		400
Small Heifers			200		200
Bulls					0

	Calf Hutches				Calf Corrals		
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	Total # of Calves
Calves							0

Total Herd Summary	
Total Milk Cows	1,500
Total Mature Cows	1,950
Support Stock (Heifers, Calves, and Bulls)	600
Total Calves	0
Total Dairy Head	2,550

Pre-Project Silage Information

Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

Post-Project Facility Information

1. Does this facility house Holstein or Jersey cows? Holstein
   Most facilities house Holstein cows unless explicitly stated on the PTO or application.
2. Does the facility have an anaerobic treatment lagoon? no
3. Does the facility land apply liquid manure? yes
   Answering "yes" assumes worst case.
4. Does the facility land apply solid manure? yes
   Answering "yes" assumes worst case.
5. Is any scraped manure sent to a lagoon/storage pond? yes
   Answering "yes" assumes worst case.
6. Does this project result in an increase or relocation of uncovered surface area for any lagoon/storage pond? yes

NOTE: An increase in total lagoon/storage pond surface area may result in an increase in H2S emissions. The District's Technical Services Division may need to conduct H2S modeling.

Post-Project Herd Size

Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals
Milk Cows	2,500				2,500
Dry Cows			500		500
Support Stock (Heifers, Calves, and Bulls)					0
Large Heifers					0
Medium Heifers	1,800				1,800
Small Heifers			200		200
Bulls					0

	Calf Hutches				Calf Corrals		
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	Total # of Calves
Calves							0

Total Herd Summary	
Total Milk Cows	2,500
Total Mature Cows	3,000
Support Stock (Heifers, Calves, and Bulls)	2,000
Total Calves	0
Total Dairy Head	5,000

Post-Project Silage Information

Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

This spreadsheet serves only as a resource to calculate potential emissions from dairies, and may not reflect the final emissions used by the District due to parameters not addressed in this spreadsheet and/or omissions from the spreadsheet. Any other permittable equipment (e.g. IC engines, gasoline tanks, etc.) at a facility will need to be calculated separately. All final calculations used in permitting projects will be conducted by District staff.

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

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 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 1	freestall	milk cows	750	750		☐	☐	☐	☐	☐	☐	☑	☐	☐
2	Freestall 2	freestall	milk cows	250	250		☐	☐	☐	☐	☐	☐	☐	☐	☐
10	Freestall 3	freestall	milk cows	250	250		☐	☐	☐	☐	☐	☐	☐	☐	☐
11	Freestall 4	freestall	milk cows	250	250		☐	☐	☐	☐	☐	☐	☐	☐	☐
12	Corrals 1-6	open corral	dry cows	200	200		☐	☐	☐	☐	☐	☐	☐	☐	☐
13	Corrals 1-6	open corral	medium heifers	400	400		☐	☐	☐	☐	☐	☐	☐	☐	☐
14	Shade 1	saudi style barn	dry cows	100	100		☐	☐	☐	☐	☐	☐	☐	☐	☐
15	Shade 2	saudi style barn	dry cows	150	150		☐	☐	☐	☐	☐	☐	☐	☐	☐
16	Shade 3	saudi style barn	small heifers	200	200		☐	☐	☐	☐	☐	☐	☐	☐	☐
			Pre-Project Total # of Cows	2,550											

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	Freestall 1	freestall	milk cows	750	750	1.370							15%			1.17
2	Freestall 2	freestall	milk cows	250	250	1.370							15%			1.17
10	Freestall 3	freestall	milk cows	250	250	1.370							15%			1.17
11	Freestall 4	freestall	milk cows	250	250	1.370							15%			1.17
12	Corrals 1-6	open corral	dry cows	200	200	5.460							15%			4.64
13	Corrals 1-6	open corral	medium heifers	400	400	10.550							15%			8.97
14	Shade 1	saudi style barn	dry cows	100	100	1.370							15%			1.17
15	Shade 2	saudi style barn	dry cows	150	150	1.370							15%			1.17
16	Shade 3	saudi style barn	small heifers	200	200	1.370							15%			1.17
			Pre-Project Total # of Cows	2,550												

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	Freestall Barn 1	freestall	milk cows	750	750		☐	☑	☑	☐	☐	☐	☑	☑	☐
2	Shade 1	saudi style barn	dry cows	100	332		☐	☑	☑	☐	☐	☐	☑	☑	☐
5	Shade 2	saudi style barn	dry cows	150	150		☐	☑	☑	☐	☐	☐	☑	☑	☐
6	Shade 3	saudi style barn	small heifers	200	200		☐	☑	☑	☐	☐	☐	☑	☑	☐

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 2	freestall	milk cows	650	650		☐	☑	☑	☐	☐	☐	☑	☑	☐
2	Freestall Barn 3	freestall	milk cows	1,100	1,100		☐	☑	☑	☐	☐	☐	☑	☑	☐
3	Freestall Barn 4	freestall	dry cows	250	250		☐	☑	☑	☐	☐	☐	☑	☑	☐
4	Freestall Barn 4	freestall	medium heifers	800	800		☐	☑	☑	☐	☐	☐	☑	☑	☐
5	Freestall Barn 5	freestall	medium heifers	1,000	1,000		☐	☑	☑	☐	☐	☐	☑	☑	☐
		Post-Project Total # of Cows		5,000	(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	Freestall Barn 1	freestall	milk cows	750	750	1.370		12.5%	10%				15%	15%		0.78
2	Shade 1	saudi style barn	dry cows	100	332	1.370		12.5%	10%				15%	15%		0.78
5	Shade 2	saudi style barn	dry cows	150	150	1.370		12.5%	10%				15%	15%		0.78
6	Shade 3	saudi style barn	small heifers	200	200	1.370		12.5%	10%				15%	15%		0.78

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 2	freestall	milk cows	650	650	1.370		12.5%	10%				15%	15%		0.78
2	Freestall Barn 3	freestall	milk cows	1100	1100	1.370		12.5%	10%				15%	15%		0.78
3	Freestall Barn 4	freestall	dry cows	250	250	1.370		12.5%	10%				15%	15%		0.78
4	Freestall Barn 4	freestall	medium heifers	800	800	1.370		12.5%	10%				15%	15%		0.78
5	Freestall Barn 5	freestall	medium heifers	1000	1000	1.370		12.5%	10%				15%	15%		0.78

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	Freestall 1	milk cows	750	10.88	38.38	1.17	22.4	8,160	78.9	28,782	2.4	874
2	Freestall 2	milk cows	250	10.88	38.38	1.17	7.5	2,720	26.3	9,594	0.8	291
10	Freestall 3	milk cows	250	10.88	38.38	1.17	7.5	2,720	26.3	9,594	0.8	291
11	Freestall 4	milk cows	250	10.88	38.38	1.17	7.5	2,720	26.3	9,594	0.8	291
12	Corrals 1-6	dry cows	200	6.12	19.44	4.64	3.4	1,224	10.7	3,888	2.5	928
13	Corrals 1-6	medium heifers	400	3.2	7.27	8.97	3.5	1,280	8.0	2,909	9.8	3,587
14	Shade 1	dry cows	100	6.12	19.44	1.17	1.7	612	5.3	1,944	0.3	117
15	Shade 2	dry cows	150	6.12	19.44	1.17	2.5	918	8.0	2,916	0.5	175
16	Shade 3	small heifers	200	1.78	5.47	1.17	1.0	356	3.0	1,094	0.6	233
	Pre-Project Total # of Cows		**2,550**				**57.0**	**20,710**	**192.8**	**70,315**	**18.5**	**6,787**

*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)
2,550	57.0	20,710	192.8	70,315	18.5	6,787

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	Freestall Barn 1	milk cows	750	10.22	23.29	0.78	21.0	7,665	47.9	17,469	1.6	584
2	Shade 1	dry cows	100	5.76	11.81	0.78	1.6	576	3.2	1,181	0.2	78
5	Shade 2	dry cows	150	5.76	11.81	0.78	2.4	864	4.9	1,771	0.3	117
6	Shade 3	small heifers	200	1.67	3.31	0.78	0.9	334	1.8	662	0.4	156
	Post-Project # of Cows (non-expansion)		**1,200**				**25.9**	**9,439**	**57.8**	**21,083**	**2.5**	**935**

*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 2	milk cows	650	10.22	23.29	0.78	18.2	6,643	41.5	15,140	1.4	506
2	Freestall Barn 3	milk cows	1100	10.22	23.29	0.78	30.8	11,242	70.2	25,621	2.3	857
3	Freestall Barn 4	dry cows	250	5.76	11.81	0.78	3.9	1,440	8.1	2,952	0.5	195
4	Freestall Barn 4	medium heifers	800	3.01	4.43	0.78	6.6	2,408	9.7	3,542	1.7	623
5	Freestall Barn 5	medium heifers	1000	3.01	4.43	0.78	8.2	3,010	12.1	4,428	2.1	779
	Total # of Cows From Expansion		**3,800**				**67.7**	**24,743**	**141.6**	**51,683**	**8.0**	**2,960**

*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)
5,000	93.6	34,182	199.4	72,766	10.5	3,895

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	400	137	0
Cow Housing	0	0	-2,892	0	13,472	2,451	0
Liquid Manure	0	0	0	0	3,463	15,843	N/A
Solid Manure	0	0	0	0	699	3,644	0
Feed Handling	0	0	0	0	24,338	0	0
Total	**0**	**0**	**-2,892**	**0**	**42,371**	**22,074**	**N/A**

Total Daily Change in Emissions (lb/day)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	1.1	0.3	0.0
Cow Housing	0.0	0.0	-8.0	0.0	36.6	6.6	0.0
Liquid Manure	0.0	0.0	0.0	0.0	9.4	43.4	N/A
Solid Manure	0.0	0.0	0.0	0.0	2.0	10.0	0.0
Feed Handling	0.0	0.0	0.0	0.0	66.7	0.0	0.0
Total	**0.0**	**0.0**	**-8.0**	**0.0**	**115.8**	**60.3**	**N/A**

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	1,664	0	N/A
Solid Manure	0	0	0	0	0	0	0
Feed Handling	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**1,664**	**0**	**N/A**

APPENDIX B: ON-SITE MOBILE SOURCE COMBUSTION EMISSION WORKSHEETS

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	MTT	0.44	2.52	728	1.77E+00	4.87E-03
Commodity Delivery	CTT	0.70	2.52	364	1.42E+00	3.90E-03
Solid Manure	SRTT	0.40	2.52	780	1.73E+00	6.64E-03

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	MTI	0.46	15	728	1.83E-01	5.02E-04
Commodity Delivery	CTI	0.46	15	364	9.13E-02	2.51E-04
Solid Manure	SRTI	0.46	15	780	1.96E-01	7.53E-04

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	FLT	106	0.37	2	365	1.49E-02	9.41E-01	2.58E-03
Bedding Delivery	FBTD1-3	139	0.37	1.54	52	1.49E-02	1.35E-01	2.60E-03
Manure Scraping	MS1-3	139	0.37	4	4	1.49E-02	2.71E-02	6.76E-03
Manure Loading	MLT	160	0.37	0.36	365	1.49E-02	2.53E-01	6.93E-04
Feed Delivery	FBTD1-3	140	0.37	4	365	1.49E-02	2.49E+00	6.81E-03

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	MTT	0.44	41.23	728	2.90E+01	0.00E+00	*Max Hour Turcks not expected to increase
Commodity Delivery	CTT	0.70	41.23	364	2.32E+01	0.00E+00	*Max Hour Turcks not expected to increase
Solid Manure	SRTT	0.40	41.23	780	2.82E+01	0.00E+00	*Max Hour Turcks not expected to 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	MTI	24.52	15	728	9.84E+00	0.00E+00
Commodity Delivery	CTI	24.52	15	364	4.92E+00	0.00E+00
Solid Manure	SRTI	24.52	15	780	1.05E+01	0.00E+00

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	FLT	106	0.37	2	365	2.98E-01	1.883E+01	0.00E+00	*No increase is expected for max hr.
Bedding Delivery	FBTD1-3	139	0.37	1.54	52	2.98E-01	2.71E+00	3.38E-02	
Manure Scraping	MS1-3	139	0.37	4	4	2.98E-01	5.41E-01	3.38E-02	
Manure Loading	MLT	160	0.37	0.36	365	2.98E-01	5.06E+00	0.00E+00	*No increase is expected for max hr.
Feed Delivery	FBTD1-3	140	0.37	4	365	2.98E-01	4.97E+01	3.41E-02	

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
Note 3: Load factors from CalEEMod's Appendix D Table 3.3 *OFFROAD Default Horsepower and Load Factors*
Table 4. Feed Bedding Tractor Delivery: Diesel Particulate Matter Increased Emissions Apportioned by Source

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	MTT	0.44	0.04	728	2.55E-02	7.00E-05	0.00E+00	0.00E+00	*No 3-Hr or 1-Hr Max increase
Commodity Delivery	CTT	0.70	0.04	364	2.04E-02	5.61E-05	0.00E+00	0.00E+00	*No 3-Hr or 1-Hr Max increase
Solid Manure	SRTT	0.40	0.04	780	2.48E-02	9.55E-05	0.00E+00	0.00E+00	*No 3-Hr or 1-Hr Max 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	MTI	0.02	15	728	6.64E-03	1.82E-05	0.00E+00	0.00E+00	*No 3-Hr or 1-Hr Max increase
Commodity Delivery	CTI	0.02	15	364	3.32E-03	9.12E-06	0.00E+00	0.00E+00	*No 3-Hr or 1-Hr Max increase
Solid Manure	SRTI	0.02	15	780	7.11E-03	2.74E-05	0.00E+00	0.00E+00	*No 3-Hr or 1-Hr Max 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/yr)	Emissions (lb/Max 24-hr)	Emissions (lb/Max 3-hr)	Emissions (lb/Max 1-hr)
Feed Loading	FLT	106	0.37	2	365	5.00E-03	3.16E-01	8.65E-04	0.00E+00	0.00E+00
Bedding Delivery	FBTD1-3	139	0.37	1.54	52	5.00E-03	4.54E-02	8.73E-04	8.73E-04	5.67E-04
Manure Scraping	MS1-3	139	0.37	4	4	5.00E-03	9.07E-03	2.27E-03	1.70E-03	5.67E-04
Manure Loading	MLT	160	0.37	0.36	365	5.00E-03	8.48E-02	2.32E-04	0.00E+00	0.00E+00
Feed Delivery	FBTD1-3	140	0.37	4	365	5.00E-03	8.34E-01	2.28E-03	1.71E-03	5.71E-04

Note1 : Emissions based on CalEEmod's Appendix D, dafualts 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*
Table 4. Feed Bedding Tractor Delivery: Diesel Particulate Matter Increased Emissions Apportioned by Source

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	MTT	0.44	17.83	728	3.44E-02	0.00E+00
Commodity Delivery	CTT	0.70	17.83	364	2.76E-02	0.00E+00
Solid Manure	SRTT	0.40	17.83	780	4.70E-02	0.00E+00

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	MTI	11.96	15	728	0.00E+00	1.32E-02
Commodity Delivery	CTI	11.96	15	364	0.00E+00	6.59E-03
Solid Manure	SRTI	11.96	15	780	0.00E+00	1.98E-02

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	FLT	106	0.37	2	365	3.73E+00	2.35E+02	0.00E+00	6.45E-01
Bedding Delivery	FBTD1-3	139	0.37	1.54	52	3.73E+00	3.39E+01	4.23E-01	6.51E-01
Manure Scraping	MS1-3	139	0.37	4	4	3.73E+00	6.76E+00	4.23E-01	1.69E+00
Manure Loading	MLT	160	0.37	0.36	365	3.73E+00	6.33E+01	0.00E+00	1.73E-01
Feed Delivery	FBTD1-3	140	0.37	4	365	3.73E+00	6.22E+02	4.26E-01	8.52E-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?Dockey=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*
Table 4. Feed Bedding Tractor Delivery: Diesel Particulate Matter Increased Emissions Apportioned by Source

APPENDIX C: AAQA-PSD REPORT FOR NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$ AND H_2S

AAQA for Toste 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
FBTD1	2.54E+00	2.39E-02	1.14E+01	1.09E+00	1.52E-02	8.27E-03	1.95E-03	1.21E-03	1.36E-03	1.21E-03	1.36E-03	0.00E+00
FBTD2	6.87E-01	6.23E-03	2.39E+01	2.02E+00	3.21E-02	1.65E-02	4.37E-04	1.89E-03	2.02E-04	1.89E-03	2.02E-04	0.00E+00
FBTD3	4.86E-01	2.31E-03	1.85E+01	1.78E+00	2.48E-02	1.24E-02	3.23E-04	1.28E-03	1.96E-04	1.28E-03	1.96E-04	0.00E+00
CTT	0.00E+00	9.44E-03	0.00E+00	3.89E-02	0.00E+00	0.00E+00	2.47E-05	9.31E-04	2.80E-04	9.31E-04	2.80E-04	0.00E+00
CTI	0.00E+00	4.28E-03	0.00E+00	1.05E-02	0.00E+00	0.00E+00	4.12E-06	4.48E-05	1.72E-05	5.11E-06	1.96E-06	0.00E+00
MS1	8.88E-01	4.45E-05	2.29E+01	4.51E+00	3.07E-02	1.73E-02	6.75E-04	2.02E-03	4.69E-06	2.31E-04	5.35E-07	0.00E+00
MS2	1.18E+00	4.56E-05	4.01E+01	6.88E+00	5.38E-02	3.22E-02	6.96E-04	3.65E-03	4.37E-06	3.65E-03	4.37E-06	0.00E+00
MS3	5.12E-01	1.44E-05	2.23E+01	3.14E+00	2.98E-02	1.53E-02	2.37E-04	1.48E-03	1.44E-06	1.48E-03	1.44E-06	0.00E+00
FLT	0.00E+00	1.12E-02	0.00E+00	1.08E+00	0.00E+00	0.00E+00	3.95E-04	4.83E-04	1.92E-04	0.00E+00	1.92E-04	0.00E+00
FSB4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.25E+00	3.48E-01	0.00E+00	3.96E-02	0.00E+00
FSB5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.57E+00	2.33E-01	2.93E-01	2.65E-02	0.00E+00
MLT	0.00E+00	1.23E-03	0.00E+00	2.66E-01	0.00E+00	0.00E+00	5.85E-05	1.56E-04	3.58E-05	1.56E-04	3.58E-05	0.00E+00
MTT	0.00E+00	2.82E-03	0.00E+00	2.06E-01	0.00E+00	0.00E+00	1.87E-05	4.57E-03	3.78E-04	4.57E-03	3.78E-04	0.00E+00
MTI	0.00E+00	6.12E-04	0.00E+00	3.40E-02	0.00E+00	0.00E+00	7.90E-06	1.85E-04	3.30E-05	1.85E-04	3.30E-05	0.00E+00
SRTT	0.00E+00	3.68E-03	0.00E+00	9.36E-02	0.00E+00	0.00E+00	2.42E-05	2.36E-03	2.63E-04	2.36E-03	2.63E-04	0.00E+00
SRTI	0.00E+00	2.45E-03	0.00E+00	3.17E-02	0.00E+00	0.00E+00	7.05E-06	1.91E-04	3.12E-05	0.00E+00	3.12E-05	0.00E+00
LAGOON3	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	1.37E+01
Background	8.35E+01	1.42E+01	3.33E+03	2.95E+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
Facility Totals	8.98E+01	1.43E+01	3.47E+03	2.97E+03	2.05E+01	1.84E+01	7.33E+00	1.48E+02	3.52E+01	8.85E+01	1.52E+01	1.37E+01
AAQS	188.68	100	23000	10000	195	1300	105	50	20	35	12	42
	Pass	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**	**Pass**	**Fail**	**Fail**	**Fail**	**Fail**	**Pass**

District and EPA's Significance Level (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
Totals w/o Background								**4.84**	**0.58**	**0.31**	**0.07**
SIL	**0**	**1**	**2000**	**500**	**0**	**25**	**5**	**10.4**	**2.08**	**2.5**	**0.63**
								Pass	**Pass**	**Pass**	**Pass**

AAQA Emission (g/sec)

Device	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
FBTD1	4.30E-03	3.80E-04	5.38E-02	1.19E-02	7.21E-05	5.45E-05	8.33E-06	2.48E-05	1.90E-05	2.48E-05	1.90E-05	0.00E+00
FBTD2	2.58E-03	2.24E-04	3.17E-02	7.03E-03	4.26E-05	3.22E-05	4.93E-06	1.47E-05	1.12E-05	1.47E-05	1.12E-05	0.00E+00
FBTD3	1.71E-03	1.51E-04	2.14E-02	4.74E-03	2.87E-05	2.17E-05	3.31E-06	9.89E-06	7.53E-06	9.89E-06	7.53E-06	0.00E+00
CTT	0.00E+00	3.34E-04	0.00E+00	4.35E-04	0.00E+00	0.00E+00	2.95E-07	2.05E-05	2.04E-05	2.05E-05	2.04E-05	0.00E+00
CTI	0.00E+00	7.07E-05	0.00E+00	1.04E-04	0.00E+00	0.00E+00	4.79E-08	1.32E-06	1.31E-06	1.32E-06	1.31E-06	0.00E+00
MS1	1.47E-03	2.69E-06	1.84E-02	9.18E-03	2.47E-05	2.47E-05	4.11E-06	1.22E-05	1.34E-07	1.22E-05	1.34E-07	0.00E+00
MS2	1.93E-03	3.51E-06	2.41E-02	1.20E-02	3.22E-05	3.22E-05	5.37E-06	1.60E-05	1.75E-07	1.60E-05	1.75E-07	0.00E+00
MS3	8.68E-04	1.58E-06	1.08E-02	5.42E-03	1.45E-05	1.45E-05	2.42E-06	7.23E-06	7.92E-08	7.23E-06	7.92E-08	0.00E+00
FLT	0.00E+00	2.71E-04	0.00E+00	1.02E-02	0.00E+00	0.00E+00	4.53E-06	1.35E-05	1.35E-05	1.35E-05	1.35E-05	0.00E+00
FSB4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-02	1.18E-02	1.35E-03	1.35E-03	0.00E+00
FSB5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.12E-02	1.12E-02	1.28E-03	1.28E-03	0.00E+00
MLT	0.00E+00	7.28E-05	0.00E+00	2.73E-03	0.00E+00	0.00E+00	1.22E-06	3.64E-06	3.64E-06	3.64E-06	3.64E-06	0.00E+00
MTT	0.00E+00	4.17E-04	0.00E+00	5.42E-04	0.00E+00	0.00E+00	3.68E-07	2.56E-05	2.54E-05	2.56E-05	2.54E-05	0.00E+00
MTI	0.00E+00	1.42E-04	0.00E+00	2.08E-04	0.00E+00	0.00E+00	9.57E-08	2.63E-06	2.63E-06	2.63E-06	2.63E-06	0.00E+00
SRTT	0.00E+00	4.05E-04	0.00E+00	7.40E-04	0.00E+00	0.00E+00	5.01E-07	3.49E-05	2.49E-05	3.49E-05	2.49E-05	0.00E+00
SRTI	0.00E+00	1.51E-04	0.00E+00	3.11E-04	0.00E+00	0.00E+00	1.44E-07	3.96E-06	2.82E-06	3.96E-06	2.82E-06	0.00E+00
LAGOON3	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	1.08E-02

APPENDIX D: AERMOD ELECTRONIC FILES