

AUG 01 2017

Wendel Trinkler Jr
Trinkler Dairy
PO Box 10
Ceres, CA 95307

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: N-6208
Project Number: N-1150266

Dear Mr. Trinkler Jr:

Enclosed for your review and comment is the District's analysis of Trinkler Dairy's application for an Authority to Construct for the expansion of an existing dairy operation from a maximum herd capacity of 1,400 milk cows, not to exceed a combined total of 1,575 mature cows (milk and dry), and 1,575 total support stock (heifers and calves); to a maximum herd capacity of 3,180 milk cows, not to exceed a combined total of 3,780 mature cows (milk and dry), and 1,395 total support stock, at 7251 Crows Landing Rd, Ceres, CA.

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. After addressing all comments made during the 30-day public notice period, the District intends to issue the Authority to Construct. Please submit your written comments on this project within the 30-day public comment period, as specified in the enclosed public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Carlos Garcia of Permit Services at (559) 230-5893.

Sincerely,



Arnaud Marjollet
Director of Permit Services

AM:cg

Enclosures

cc: Tung Le, CARB (w/ enclosure) via email
Joe Ramos, F&R Ag Services, Inc. (w/ enclosure) via email

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San Joaquin Valley Air Pollution Control District

Authority to Construct

Application Review

Dairy Expansion

Facility Name:	Trinkler Dairy	Date:	July 27, 2017
Mailing Address:	PO Box 10 Ceres, CA 95307	Engineer:	Carlos Garcia
Contact Person:	Joe Ramos, Consultant	Lead Engineer:	Jerry Sandhu
Telephone:	(209) 250-2471	Dairy Owner:	Wendel Trinkler Jr
Email:	jramos@fragservices.com	Telephone:	(209) 537-9883
Application #s:	N-6208-1-3, -2-3, -3-3, -4-3, & -7-2		
Project #:	N-1150266		
Deemed Complete:	October 29, 2015		

I. Proposal

Trinkler Dairy has requested Authority to Construct (ATC) permits for the expansion of an existing dairy operation. The facility is proposing to increase the herd size from the current capacity of 3,150 total head consisting of a maximum herd capacity of 1,400 milk cows, not to exceed a combined total of 1,575 mature cows (milk & dry), and 1,575 total support stock (heifers and calves) to 5,175 total head consisting of a maximum herd capacity of 3,180 milk cows, not to exceed a combined total of 3,780 mature cows (milk and dry), and decrease support stock to 1,395 total. The applicant has requested the support stock be broken up into 275 large heifers (15-24 months), 520 small heifers (4-6 months), and 600 calves (0-3 months).

The Permits to Operate (PTOs) for the existing operation are included in Appendix A. The draft ATCs for the proposed modifications are included in Appendix B. A project site plan showing the proposed modifications is included in Appendix C.

The proposed expansion includes the construction of one new 1,580 milk cow freestall barn (freestall #8), one new rotary milking parlor, one new Saudi style barn (Saudi style barn #5) which will be used to house 300 calves, and one new anaerobic treatment lagoon.

The facility proposes to modify the milking parlor permit (N-6208-1) by building a new 72-stall rotary milking parlor. The existing milking parlor will be repurposed into a hospital milking parlor.

The cow housing permit (N-6208-2) will be modified to add the new freestall barn, the new Saudi style barn which will be used to house 300 calves, and changes to the herd size. The new freestall barn will be constructed over existing open corrals (pens 1-9), and post-project there will not be any open corrals (except for Saudi style barns and exercise pens for the

currently permitted for seven freestall barns and four Saudi style barns. After the modifications are complete, the facility will be permitted for eight freestall barns and five Saudi style barns.

Additionally, the facility currently has two barns (#6 and #7) along the south side of the facility. Barns #6 and #7 are identified on the current permit as freestall barns. However as stated by the applicant, these barns are actually split lengthwise between the feedlanes with the northern half consisting of freestall barns with individual stalls, and the southern half consisting of loafing barns with open corrals. The facility is proposing to convert the loafing barn portion of barns #6 and #7 (identified on the pre-project site plan as 6L and 7L in Appendix C) into freestalls for milk cows. This proposed modification will not expand the current footprint of these two barns.

Despite the proposed increase in animal herd size, and the proposed modifications to the cow housing area, the project will result in a decrease in PM₁₀ emissions. The decrease in PM₁₀ is due to removing open corrals and replacing them with freestalls which generate less PM₁₀ emissions.

The liquid and solid manure permits (N-6208-3 and -4) will be modified to account for the increase in emissions as a result of the additional manure expected from the proposed herd modifications. The facility will construct a new anaerobic lagoon (500' x 375' x 15') to accommodate the increased amount of manure.

The increase in herd size will result in a modification to the feed storage and handling permit (N-6208-7). This permit will be modified to account for the resulting increase in emissions due to Total Mixed Rations (TMR). Furthermore, the facility has proposed to remove silage piles and exclusively use ag-bags.

II. Applicable Rules

Rule 1070 Inspections (12/17/92)
Rule 2010 Permits Required (12/17/92)
Rule 2201 New and Modified Stationary Source Review Rule (4/21/11)
Rule 2410 Prevention of Significant Deterioration (6/16/11)
Rule 2520 Federally Mandated Operating Permits (6/21/01)
Rule 4101 Visible Emissions (2/17/05)
Rule 4102 Nuisance (12/17/92)
Rule 4550 Conservation Management Practices (CMP) (8/19/04)
Rule 4570 Confined Animal Facilities (CAF) (10/21/10)
CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notice
Senate Bill 700 (SB 700)
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The facility is located at 7251 Crows Landing Rd, Ceres, CA. The facility is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

The primary function of Trinkler Dairy is the production of dairy milk, which is used to make various food products, such as fluid milk,¹ butter, cheese, ice cream, and yogurt. Production of milk requires a herd of mature dairy cows that are lactating (milk cows). A cow's lactation cycle starts shortly after calving and lasts for approximately 12 months. Typically, a 10-month lactation period is followed by a 2-month non-lactation (dry cow) period, during which the cow prepares to calve again and begin a new lactation cycle. After the first few lactation cycles, the cow's milk yield is expected to decline steadily with each subsequent cycle.

Female calves are retained in the herd while the male calves are sold off for meat production or other purposes. The calves take approximately 15 to 24 months to reach reproductive maturity, at which point they enter the milk production stream as bred heifers. Thus, in addition to the mature cows (milk and dry), a typical dairy herd also includes a certain proportion of calves and heifers at various stages of development (support stock). Mature cows that are culled from the herd (primarily due to diminishing milk yield, but also due to injury, disease, or other reasons) are replaced by the bred heifers entering the milk production stream. The support stock may also include a certain number of mature bulls for breeding purposes, although this is not common due to the prevalent use of artificial insemination.

The primary functions involved in the day to day operation of a dairy include housing and feeding the herd, milking, and management of manure. These functions are described in more detail in the following sections:

Milking

Milking is a dairy's primary income generating activity. The lactating cows are milked two to four times per day. The milk is chilled and temporarily stored in onsite tanks until it is collected by tanker truck for delivery to a creamery. A purpose-built structure known as the milking parlor is used for milking and the associated onsite milk handling activities. The milking parlor is located in proximity to, but separate from the lactating cow housing areas. It is designed to facilitate efficient in-and-out movement of groups of cows being milked; and also to allow workers access to individual cows during milking. The first part of the milking parlor, known as the holding area, is an open-sided roofed space where cows that are ready for milking are temporarily confined as they enter the milking parlor. The milking occurs in the milking parlor within the barn.

Due to food safety regulations, high standards of hygiene must be observed in the milking parlor. The parlor floors are constructed of concrete, and are properly sloped to ensure effective drainage. Any manure that is deposited on the parlor floors during milking is promptly

¹ Milk that has been processed in various ways (e.g. pasteurization, homogenization, fortification, etc.) and is intended to be consumed primarily as a beverage.

sprayed down with clean water and flushed into the drainage system, from where it is carried through pipes into the manure lagoons.

To accommodate Trinkler Dairy's proposed increase in milk cows, a new 72 stall rotary milking parlor will be constructed on the south side of the facility. Trinkler Dairy currently has one double herringbone 21 (42 stall) milk parlor, and the applicant is proposing to convert this existing milking parlor into a hospital milking parlor (no changes to stalls).

Cow Housing

The cows at this dairy are housed in freestall barns (milk and dry cows), loafing barns (milk), Saudi style barns (heifers, calves and special needs) and open corrals (heifers and special needs). A standard barn design consists of a feed alley through the center of the barn, with a feed bunk on either side. For freestall barns, the rest of the barn floor is divided into rows of individual resting stalls. For Saudi style barns, the barn floor is divided into communal pens rather than individual stalls. Various bedding materials are used in the stalls or pens for animal comfort and to prevent animal injury. In addition, loose dirt exercise pens adjoining the barns are provided. Manure from barn feed lanes is removed by flushing with water. Manure from the exercise pen surfaces is removed by scraping with a box-type scraper.

The milk cows and dry cows at Trinkler Dairy are currently housed in seven barns identified currently as freestalls #1 through #7 (including 6F, 6L, 7F and 7L). Additional support stock at this dairy are housed in corrals and Saudi barns with scraped or flushed lanes.

To accommodate the dairy expansion, barns #6 and #7 will be fully converted to freestall barns with adjacent exercise pen areas. This proposed modification will not expand the current footprint of barns #6 and #7. A new freestall barn (#8) will house 1,580 milk cows and will be constructed on the southernmost part of the dairy replacing existing open corrals (pens #1 through #9). Freestall barn #8 will be required to have concrete feed lanes and walkways with flushing four times per day.

There are three existing Saudi style barns (Saudi style barns #1, 2 and 3) that house 210 heifers. After the modification, these three barns will house 150 heifers due to the facility's proposal to decrease the overall number of support stock (heifers).

Currently, 300 calves (0 - 3 months old) are housed within one Saudi style barn (Saudi style barn #4) with aboveground hutches. Hutches typically house individual calves or a small group of calves, depending on the age of the calves and the degree of care required. To accommodate the dairy expansion, one new Saudi style barn (Saudi style barn #5) will be built to house an additional 300 calves in aboveground hutches.

The modifications will result in no open corrals at this dairy. Pre-project and post-project housing arrangements are shown in Appendix C.

Liquid Manure Handling System

Milk cows generate anywhere from 130 to 150 pounds of manure per day. The manure is deposited primarily in areas where the cows are housed and fed (cow housing), but a small amount is deposited in the milking parlor and other transit areas. The manure is collected and

managed in liquid and solid forms. Manure with a total solids content of 20% or higher usually can be handled as a solid, while manure with a total solids content of 10% or less can be handled as a liquid.

The liquid manure handling system currently consists of two mechanical solids separators, two storage lagoons and land application of treated liquid manure.

The facility is proposing to construct one anaerobic treatment lagoon (500' x 375' x 15') to accommodate the increased amount of manure generated from the herd expansion.

Mechanical Separator

Flush water from the milk barn and housing areas is periodically agitated and pumped over the mechanical separator screens. The liquid passes through the screens and flows into the liquid manure lagoons. The solids fall off the screen bottom and onto a stacking pad, where they are later removed by a front end loader and spread out to dry on drying pads.

Mechanical separators separate solids out from the liquid/slurry stream. There are many different versions of separators on the market. The percentage of separation varies depending on screen size and type of separation system. However, fifty percent solid removal efficiency is used as a general rule of thumb. Although the separation efficiency can be improved by better separation or addition of separators or screens, it does not necessarily result in an increase in VOC emission reduction. The type of solids removed are generally non-digestible (lignins, cellulose, etc.) materials that do not easily digest in the lagoon; the amount of volatile solids that end up in the lagoon will most likely not change even though there is an increase in solid removal efficiency. In addition, there is no data that links higher removal efficiency with an increase in VOC emission reduction.

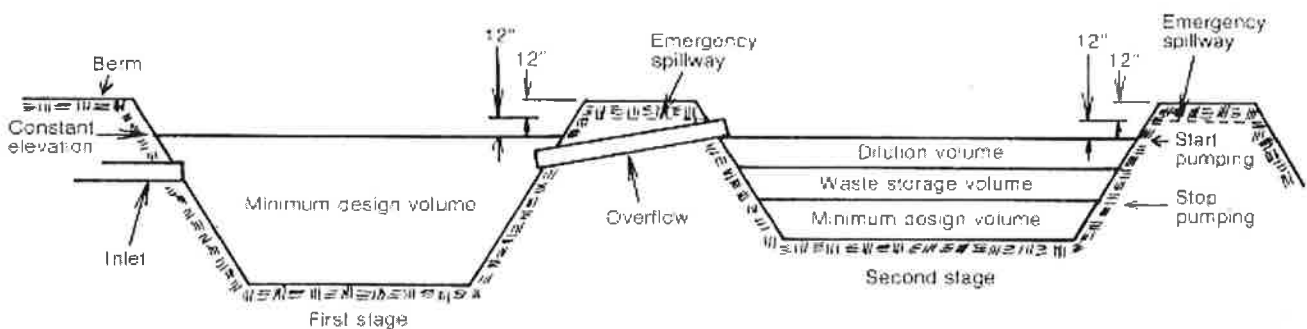
Anaerobic Treatment Lagoon

An anaerobic treatment lagoon is a waste treatment lagoon that is designed to facilitate the decomposition of manure by microbes in the absence of oxygen. This process of anaerobic decomposition results in the preferential conversion of organic compounds in the manure into methane, carbon dioxide, and water rather than intermediate metabolites (VOC). The Natural Resources Conservation Service (NRCS) Field Office Technical Guide No. 359, Waste Treatment Lagoon, for California specifies the following criteria for anaerobic treatment lagoons:

- 1) Minimum treatment volume - the minimum design volume must account for all potential sludge, treatment, precipitation, and runoff volumes;
- 2) Minimum hydraulic retention time - the retention time of the material in the lagoon must be adequate to provide environmentally safe utilization of waste;
- 3) Maximum volatile solids (VS) loading rate - the VS loading rate shall be based on maximum daily loading considering all waste sources that will be treated by the lagoon. The suggested loading rate for the San Joaquin Valley is 6.5 - 11 lb-VS/1000 ft³/day depending on the type of system and solids separation; and

- 4) Minimum operating depth of at least 12 feet - maximizing the depth of the lagoon has the following advantages: 1) The surface area in contact with the atmosphere is minimized, which will reduce volatilization of air pollutants; 2) The smaller surface area reduces the effects of the environment on the lagoon, which provides a more stable and favorable environment for anaerobic bacteria; 3) There is better mixing of lagoon due to rising gas bubbles; 4) and a deeper lagoon requires less land for the required treatment volume.

The anaerobic treatment lagoon system consists of two stages, a treatment lagoon (primary lagoon) and a storage pond (secondary lagoon). The effluent from the treatment lagoon overflows into the storage pond/secondary lagoon, which is designed for liquid storage. The liquid level of the storage pond/secondary lagoon fluctuates and can be emptied when necessary. Effluent from the storage pond is used for the irrigation of cropland. All the liquid manure at the dairy is pumped to the anaerobic treatment lagoon system.



Trinkler Dairy proposes to build an anaerobic treatment primary lagoon designed in accordance with the specifications set forth in NRCS practice standard 359 as described above. The dimensions of the new anaerobic lagoon will be 500 ft. x 375 ft. x 15 ft. and the slope (run/rise) will be 3.0. The volume of the anaerobic primary lagoon will be 2,020,239 ft³ (refer to Appendix D for the anaerobic lagoon design check).

Storage Pond/Secondary Lagoon

Storage ponds are designed to have sufficient volume to hold all of the following: all manure and wastewater accumulated at the dairy for a period of 120 days; normal precipitation and any drainage to the lagoon system minus evaporation from the surface of lagoons; and precipitation during a 25 year, 24 hour storm event.

Land Application

Liquid manure treated from the anaerobic lagoon will be applied to cropland as fertilizer/irrigation water. The application is done through flood and furrow irrigation, at agronomic rates in conformance with a nutrient management plan that has been approved by the Regional Water Quality Control Board.

Solid Manure Handling

Solid manure is stored in stockpiles until ready to be applied to cropland as fertilizer, or shipped offsite. Separated solids are dried and stockpiled for use as bedding material in the freestalls.

Feed Handling and Storage

The feed storage and handling area is used for the storage of feed ingredients and for the preparation of daily feed rations (known as 'total mixed rations', or TMR). Silage, the main ingredient in TMR, will be stored exclusively in ag bags at this facility. Only three of the ag bags, with an open end face, will be used for active feeding, and the remainder of the ag bags will remain closed. Feed amounts are extracted from the open end of the three active ag bags, as needed. Loaders are used to retrieve the required proportions of the silage from the ag bag (open face is approximately 8 ft. by 12 ft.) and load them into a feed wagon with a built-in mixer. Once the silage and additive ingredients are thoroughly mixed, the feed wagon drives over to the cow housing areas to spread the TMR along the feed lanes.

V. Equipment Listing

Pre-Project Equipment Description

- N-6208-1-2: 1,400 COW MILKING OPERATION WITH ONE DOUBLE HERRINGBONE (21 STALL) MILK PARLOR
- N-6208-2-2: COW HOUSING - 1,400 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 1,575 MATURE COWS (MILK AND DRY); 1,575 TOTAL SUPPORT STOCK (HEIFERS AND CALVES); AND 7 FREESTALLS WITH FLUSH/SCRAPE SYSTEM
- N-6208-3-2: LIQUID MANURE HANDLING SYSTEM CONSISTING OF ONE SETTLING BASIN; MECHANICAL SEPARATOR AND ONE STORAGE POND; MANURE IS LAND APPLIED THROUGH FLOOD IRRIGATION
- N-6208-4-2: SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; SOLID MANURE APPLICATION TO LAND AND HAULED OFFSITE
- N-6208-7-1: FEED STORAGE AND HANDLING CONSISTING OF COMMODITY BARNs AND SILAGE PILES

Proposed Modification

- N-6208-1-3²: MODIFICATION OF 1,400 COW MILKING OPERATION WITH ONE DOUBLE 21 HERRINGBONE (42 STALL) MILK PARLOR: INCREASE NUMBER OF MILK COWS TO 3,180, ADD ONE NEW 72 STALL ROTARY MILKING PARLOR, AND

² Based on a District inspection performed on 9/22/15, the milking parlor equipment was identified as a Double 21 Herringbone with a total of 42 stalls. Therefore, the equipment description in the ATC is updated with the correct information.

REPURPOSE THE DOUBLE 21 HERRINGBONE (42 STALL) MILKING PARLOR INTO A HOSPITAL MILKING PARLOR

- N-6208-2-3: MODIFICATION OF COW HOUSING - 1,400 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 1,575 MATURE COWS (MILK AND DRY); 1,575 TOTAL SUPPORT STOCK (HEIFERS AND CALVES); AND 7 FREESTALLS WITH FLUSH/SCRAPE SYSTEM: INCREASE MAXIMUM NUMBERS OF COWS TO 3,180 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 3,780 MATURE COWS (MILK AND DRY), AND DECREASE SUPPORT STOCK TO 1,395 CONSISTING OF 275 LARGE HEIFERS (15-24 MONTHS), 520 SMALL HEIFERS (4-6 MONTHS), AND 600 CALVES (0-3 MONTHS); CONSTRUCT ONE NEW FREESTALL BARN (FREESTALL #8), FULLY CONVERT BARNS #6 AND #7 INTO FREESTALL BARNS, AND CONSTRUCT NEW CALF HOUSING IN ABOVEGROUND HUTCHES AND SAUDI STYLE BARN
- N-6208-3-3³: MODIFICATION OF LIQUID MANURE HANDLING SYSTEM CONSISTING OF ONE SETTLING BASIN; MECHANICAL SEPARATOR AND TWO STORAGE PONDS; MANURE IS LAND APPLIED THROUGH FLOOD IRRIGATION: ALLOW INCREASE IN THROUGHPUT DUE TO HERD EXPANSION AND CONSTRUCT AN ANAEROBIC TREATMENT LAGOON (500' X 375' X 15')
- N-6208-4-3: MODIFICATION OF SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; SOLID MANURE APPLICATION TO LAND AND HAULED OFFSITE: ALLOW INCREASE IN THROUGHPUT DUE TO HERD EXPANSION
- N-6208-7-2: MODIFICATION OF FEED STORAGE AND HANDLING CONSISTING OF COMMODITY BARNS AND SILAGE PILES: ALLOW INCREASE IN TOTAL MIXED RATION FEEDING DUE TO HERD EXPANSION, REMOVE SILAGE PILES AND ADD AG BAG(S)

Post-Project Equipment Description

- N-6208-1-3: 3,180 COW MILKING OPERATION WITH ONE 72 STALL ROTARY MILKING PARLOR AND ONE DOUBLE 21 HERRINGBONE (42 STALL) HOSPITAL MILKING PARLOR
- N-6208-2-3: COW HOUSING – 3,180 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 3,780 MATURE COWS (MILK AND DRY); 1,395 TOTAL SUPPORT STOCK (HEIFERS AND CALVES) CONSISTING OF 795 HEIFERS, 600 CALVES IN ABOVEGROUND HUTCHES AND SAUDI STYLE BARNS; AND 8 FREESTALL BARNS AND 5 SAUDI STYLE BARNS WITH FLUSH/SCRAPE SYSTEM
- N-6208-3-3: LIQUID MANURE HANDLING SYSTEM CONSISTING OF SETTLING BASIN(S); MECHANICAL SEPARATOR(S); ONE ANAEROBIC TREATMENT LAGOON (500'

³ Based on information on the ATC application, the liquid manure handling equipment has two storage ponds instead of the one as indicated on the current permit. Additionally, Google Earth historical maps (dated 3/30/2002) show that the storage ponds were there before the facility needed permits from the District. Therefore, the equipment description in the ATC is updated with the correct information for two storage ponds.

X 375' X 15') AND TWO STORAGE PONDS; MANURE IS LAND APPLIED THROUGH FLOOD IRRIGATION

N-6208-4-3: SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; SOLID MANURE APPLICATION TO LAND AND/OR HAULED OFFSITE

N-6208-7-2: FEED STORAGE AND HANDLING CONSISTING OF COMMODITY BARN(S), AG BAG(S), AND TOTAL MIXED RATION FEEDING

VI. Emission Control Technology Evaluation

Particulate matter (PM₁₀), volatile organic compounds (VOC), hydrogen sulfide (H₂S), and ammonia (NH₃) are the major pollutants of concern from dairy operations. PM₁₀ emissions are generated primarily from the action of cows' hooves on dust and dry manure, which is subsequently picked up by wind and entrained into the atmosphere. VOC emissions are generated from the ruminant digestive process (i.e. enteric emissions), decomposition and fermentation of feed, and decomposition of organic matter in manure. NH₃ and H₂S emissions are generated from microbial metabolization of nitrogen and sulfur compounds in manure. The quantity of these emissions depends directly on the herd size and profile.⁴

Rule 4570 defines corrals to include Saudi style barns, so for this evaluation, corrals will refer to the Saudi style barn corral surfaces. Various management practices are used to control emissions at this dairy. Some of these practices are discussed below:

Milking Parlors (N-6208-1)

A flush/spray system is used to wash out the manure from the milking parlors before, during, or after each group of cows is milked. Frequent flushing creates a moist environment that greatly reduces or eliminates PM₁₀ emissions. In addition, flush water dissolves NH₃ as well as various water-soluble VOC in the manure, thereby stopping or decelerating the emission of these pollutants directly into the atmosphere. Both manure and dissolved pollutants are subsequently carried by the flush water into the liquid manure handling system for further treatment.

Cow Housing (N-6208-2)

Milk and dry cows at Trinkler Dairy will be housed in freestall barns. Practices that will be utilized to reduce emissions at the dairy include: frequent flushing or scraping of lanes; scraping of exercise pens and Saudi barn surfaces; and feeding animals in accordance with NRC guidelines. These practices are described below.

Frequent flushing and scraping

Manure, which is a source of emissions, will be removed from the Saudi barn corral surface lanes by flushing and scraping. When a flush system is used, a large proportion of the VOCs emitted from fresh cow manure will dissolve in the flush water and will not be emitted from the cow housing permit unit. Because of ammonia's high affinity for and solubility in

⁴ Herd size refers to the total number of cows, whereas profile refers to the specific categories (e.g. milk, dry, heifer, calf) that constitute the herd.

water, flushing the lanes and walkways will also reduce volatilization of ammonia from the manure deposited in the corral lanes. For freestall barns #6 through #8, the lanes and walkways for the milk cows will be flushed four times per day and the lanes and walkways in the Saudi style surfaces for the heifers will be flushed or scraped at least once every seven days.

Frequent flushing is also used for the removal of manure from the lanes and walkways in the housing barns. The emissions control mechanisms are the same as described above.

Feeding Animals in Accordance with the NRC Guidelines

All animals housed at the dairy will be fed in accordance with National Research Council (NRC) guidelines using routine nutritional analysis for rations. Feeding the cows in accordance with NRC guidelines minimizes undigested protein and other undigested nutrients in the manure, which would emit NH_3 , VOCs, and H_2S upon decomposition.

Liquid Manure Handling System (N-6208-3)

Solids Separation

The liquid manure handling system is equipped with mechanical separators for solids separation. Solids separation prevents excessive loading of solids into the anaerobic treatment system, which could inhibit microbial activity.

Anaerobic Treatment Lagoon

A properly designed and operated anaerobic treatment lagoon system reduces VOC emissions by optimizing the anaerobic activity that favors the complete conversion of organic compounds in the manure into methane, carbon dioxide, and water instead of partial conversion into various intermediate metabolites that are predominantly VOC. Pursuant to the design check analysis shown in Appendix D, the proposed anaerobic treatment lagoon system is expected to meet the standard requirements.

Liquid Manure Land Application

Liquid manure will be applied to cropland at agronomic rates, in compliance with the dairy's comprehensive nutrient management plan and the requirements of the Regional Water Quality Control Board. These practices are expected to reduce odors and result in faster uptake of nutrients by crops. When applied nutrients are optimally matched with the nutrient needs of developing crops, the excess nutrients that are associated with increased emissions and/or groundwater pollution are minimized. All liquid manure will be treated by the new anaerobic lagoon.

Solid Manure Handling (N-6208-4)

Rapid Incorporation of Solid Manure Applied to Land

Based on the information currently available, emissions from solid manure applied to cropland are expected to be low. However, to ensure that any possible emissions are

minimized, the manure will be promptly incorporated into the soil after application. This will reduce any volatilization of gaseous pollutants, as the soil provides cover from wind and other weather elements that enhance volatilization. In addition, incorporation reduces emissions by biofilter effect, whereby the adsorption of NH_3 , VOC, and other compounds onto soil particles provides an opportunity for oxidation by the action of various microorganisms in the soil.⁵

Feed Handling and Storage (N-6208-7)

All cows will be fed in accordance with National Research Council (NRC) guidelines using routine nutritional analysis for rations. NRC guidelines are intended to optimize nutrient uptake by the cow, which not only increases feed efficiency but also minimizes the excretion of undigested protein and other nutrients in the manure. Since excess manure nutrients are the feedstock for the processes that result in NH_3 , H_2S and VOC emissions as manure decomposes, the reduction of nutrients in the manure is expected to reduce the emission of these pollutants.

In addition, any refused feed will be removed from the feed lanes on a regular basis to minimize gaseous emissions from decomposition. Silage will be stored in ag bags to minimize volatilization of pollutants.

VII. General Calculations

A. Assumptions

- Potential to emit calculations will be based on the permitted limits for the different age categories of cows in the existing and proposed herds.
- Only non-fugitive emissions are considered when determining major source status. For this facility, the lagoon/storage ponds (permit unit N-6208-3), emergency standby engine (permit unit N-6208-5), and gasoline dispensing operation (permit unit N-6208-6) are the only sources of non-fugitive emissions.
- Freestall barns #6 and #7 are actually split lengthwise between the feedlanes with the northern half consisting of freestall barns with individual stalls, and the southern half consisting of loafing barns with open corrals. The facility is proposing to convert the loafing barn portion of barns #6 and #7 (identified on the pre-project site plan as 6L and 7L in Appendix C) into freestalls for milk cows.
- The conditions on the existing Permits to Operate are based on the Rule 4570 Phase II mitigation measures originally proposed via application/project N-1110993. Since the applicant has not proposed any Rule 4570 Phase II mitigation measure changes, the existing mitigation measures will be used in the current evaluation. Modifications to specific measures will be made, as necessary, to accommodate New Source Review requirements from the current project.
- All PM_{10} emissions will be allocated to the cow housing permit unit (N-6208-2).
- All H_2S emissions will be allocated to the liquid manure permit unit - lagoons. (N-6208-3).

⁵ Page 9-38 of U.S. EPA's draft document entitled "Emissions From Animal Feeding Operations" (<http://www.epa.gov/ttn/chief/ap42/ch09/draft/draftanimalfeed.pdf>)

- There will be no medium heifers (7-14 months) at this facility (per applicant).
- Because H₂S is produced as a result of the decomposition of sulfur compounds under anaerobic conditions and the lagoon and storage ponds will be the primary source of H₂S emissions at a dairy, all H₂S emissions from the dairy will be allocated to the lagoon/storage of the liquid manure handling permit unit (N-6208-3).
- The PM₁₀ control efficiency for shade structures is from a District document titled "Dairy/Feedlot PM₁₀ Mitigation Practices and their Control Efficiencies."⁶
- The PM₁₀ emission factors are from a District document titled "Dairy and Feedlot PM₁₀ Emissions Factors,"⁷ which compiled data from studies performed by Texas A&M and ASAE, and a USDA/UC Davis report, quantifying dairy and feedlot emissions.
- The VOC emission factors for milk cows are from a District document titled "Air Pollution Control Officer's Revision to the Dairy VOC Emission Factors, February 2012."⁸ Volatile solids excretion ratios were used to derive the proportionate VOC emission factors for dry cows and support stock.
- The NH₃ emission factor for milk cows is based on California Air Resources Board's dairy cattle ammonia emission factor.⁹ Manure-based VOC emission ratios were used to apportion the NH₃ emission factor to the various emissions units. Further, nitrogen excretion ratios were used to derive the proportionate NH₃ emission factors for dry cows and support stock.
- All the mitigation measures evaluated are expected to result in VOC emission reductions. Where specific control efficiency has not been determined, a conservative 10% control efficiency will be assumed, unless noted otherwise.
- VOC emission reductions from a properly designed and maintained anaerobic treatment lagoon system are expected to be high. However, in order to be conservative, a control efficiency of 40% for both the lagoons and land application of liquid manure will be applied to this control measure, until better data become available.
- Only three ag bags, with an open end face, will be used at any one time. The remainder of the ag bags will remain closed with no expected emissions. Each of the three open ag bags being used has an open face of approximately 8 ft. by 12 ft. (per applicant)

B. Emission Factors

Detailed emission factors are listed in the emissions calculation spreadsheet in Appendix E ('Dairy Emission Factors' sheet).

⁶ http://www.valleyair.org/busind/pto/dpag/Dairy_PM10_Control_Efficiencies.pdf

⁷ http://www.valleyair.org/busind/pto/dpag/FYI_%20Dairy_Feedlot_PM10_Emission_Factor.pdf

⁸ [http://www.valleyair.org/busind/pto/emission_factors/2012-Final-Dairy-EE-Report/FinalDairyEFReport\(2-23-12\).pdf](http://www.valleyair.org/busind/pto/emission_factors/2012-Final-Dairy-EE-Report/FinalDairyEFReport(2-23-12).pdf)

⁹ <http://www.arb.ca.gov/ei/areasrc/livestockemisfwp.pdf>

C. Calculations

1. Pre-Project Potential to Emit (PE1)

The PE1 is based on the maximum permitted capacity for each age category of cows and the controls required and proposed by the applicant. All the emission calculations are included in Appendix E. A summary of the PE1 is shown in the table below:

PE1 Summary								
Permit unit	PM ₁₀		VOC		NH ₃		H ₂ S	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
N-6208-1-2	0.0	0	1.5	560	0.5	192	0.0	0
N-6208-2-2	39.7	14,471	59.1	21,506	110.3	40,175	0.0	0
N-6208-3-2	0.0	0	14.3	5,241	39.4	14,401	0.6	235
N-6208-4-2	0.0	0	2.8	1,019	14.8	5,394	0.0	0
N-6208-7-1	0.0	0	103.8	37,890	0.0	0	0.0	0

2. Post-Project Potential to Emit (PE2)

The PE2 is based on the maximum permitted capacity for each age category of cows and the controls required and proposed by the applicant. All the emission calculations are included in Appendix E. A summary of the PE2 is shown in the table below:

PE2 Summary								
Permit unit	PM ₁₀		VOC		NH ₃		H ₂ S	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
N-6208-1-3	0.0	0	3.5	1,272	1.2	435	0.0	0
N-6208-2-3	17.7	6,440	101.7	37,181	211.7	77,239	0.0	0
N-6208-3-3	0.0	0	15.0	5,470	49.1	17,916	1.1	433
N-6208-4-3	0.0	0	4.9	1,766	28.5	10,344	0.0	0
N-6208-7-2	0.0	0	102.2	37,311	0.0	0	0.0	0

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to District Rule 2201, the SSPE1 is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of Emission Reduction Credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions (AER) that have occurred at the source, and which have not been used on-site.

Pre-Project Stationary Source Potential to Emit [SSPE1] (lb/year)							
	NO _x	SO _x	PM ₁₀	CO	VOC	NH ₃	H ₂ S
N-6208-1-2 (Milking Operation)	0	0	0	0	560	192	0
N-6208-2-2 (Cow Housing)	0	0	14,471	0	21,506	40,175	0
N-6208-3-2 (Liquid Manure Handling)	0	0	0	0	5,241	14,401	235
N-6208-4-2 (Solid Manure Handling)	0	0	0	0	1,019	5,394	0
N-6208-5-0 (400 bhp Emergency Engine) ¹⁰	882	0	44	268	101	0	0
N-6208-6-0 (1 nozzle - GDO) ¹⁰	0	0	0	0	59	0	0
N-6208-7-1 (Feed Storage & Handling)	0	0	0	0	37,890	0	0
Pre-Project SSPE (SSPE1)	882	0	14,515	268	66,376	60,162	235

4. Post-Project Stationary Source Potential to Emit (SSPE2)

Pursuant to Section 4.10 of District Rule 2201, the Post-Project Stationary Source Potential to Emit (SSPE2) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

¹⁰ Emission assumptions and calculations for N-6208-5-0 and -6-0 are found in Appendix I.

Post-Project Stationary Source Potential to Emit [SSPE2] (lb/year)							
	NO _x	SO _x	PM ₁₀	CO	VOC	NH ₃	H ₂ S
N-6208-1-3 (Milking Operation)	0	0	0	0	1,272	435	0
N-6208-2-3 (Cow Housing)	0	0	6,440	0	37,181	77,239	0
N-6208-3-3 (Liquid Manure Handling)	0	0	0	0	5,470	17,916	433
N-6208-4-3 (Solid Manure Handling)	0	0	0	0	1,766	10,344	0
N-6208-5-0 (400 bhp Emergency Engine)	882	0	44	268	101	0	0
N-6208-6-0 (1 nozzle -GDO)	0	0	0	0	59	0	0
N-6208-7-2 (Feed Storage & Handling)	0	0	0	0	37,311	0	0
Post-Project SSPE (SSPE2)	882	0	6,484	268	83,160	105,934	433

5. Major Source Determination

Rule 2201 Major Source Determination

Pursuant to District Rule 2201, a major source is a stationary source with an SSPE2 equal to or exceeding one or more of the major source thresholds shown in Table 3-3. For the purposes of determining major source status the following shall not be included:

- Any ERCs associated with the stationary source
- Emissions from non-road engines (i.e. engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the source categories specified in 40 CFR 51.165

Agricultural operations do not belong to any of the source categories specified in 40 CFR 51.165. Since this facility is an agricultural operation, fugitive emissions shall not be included in determining whether it is a major stationary source.

40 CFR 71.2 defines fugitive emissions as “those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening.” In 2005, the California Air Pollution Control Officers Association (CAPCOA) issued guidance for estimating VOC emissions from dairy farms. This guidance determined that VOC emissions from the milking centers, cow housing areas, corrals, common manure storage areas, and land application of manure are considered fugitive since they are not physically contained and could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening. The guidance also determined that VOC emissions from liquid manure lagoons and storage ponds are not considered fugitive

because emission collection technologies for liquid manure systems exist. The District has researched this issue and concurs with the CAPCOA determinations, as discussed in more detail below:

Milking Parlor

The mechanical ventilation system could arguably be utilized to capture emissions from the milking parlor. In order achieve and maintain the negative pressure required for this purpose, the adjoining holding area would also need to be completely enclosed. However, enclosing the holding area is not practical due to the continuous movement of cows in and out of the barn throughout the day. In addition, the capital outlay required to enclose this large area would be prohibitive. The District therefore determines that emissions from the milking parlor cannot reasonably be captured, and are to be considered fugitive.

Cow Housing

Although there are smaller dairy farms that have enclosed housing barns, such barns are usually not fully enclosed and do not include any systems for the collection of emissions. In addition, the airflow requirements for dairy cows are extremely high, primarily for herd health reasons. Airflow requirements are expected to be even higher in places such as the San Joaquin Valley, where daytime temperatures can exceed 110 degrees for prolonged periods during the summer months. Given the high air flow rates that will be involved, collection and control of the exhaust from housing barns is not only impractical but also cost prohibitive. The District therefore determines that emissions from housing barns cannot reasonably be captured, and are to be considered fugitive.

Manure Storage Areas

Solid manure is typically stored in the housing areas, as mounds or piles in individual corrals or pens. Some manure may also be stored in piles outside the housing areas while awaiting land application, shipment offsite, or other uses. Thus, manure storage areas are widely distributed over the dairy site, making it impractical to capture emissions from any significant proportion of the solid manure. The District therefore determines that emissions from manure storage areas cannot reasonably be captured, and are to be considered fugitive.

Land Application

Since manure has to be applied over large expanses of cropland (hundreds or even thousands of acres), there is no practical method that can be used to capture the associated emissions. The District therefore determines that emissions from land application of manure cannot reasonably be captured, and are to be considered fugitive.

Feed Handling and Storage

Silage and total mixed rations (TMR) are the primary sources of emissions from feed storage and handling.

Silage will be stored in several ag bags. Only three ag bags will be actively used and the remainder of the ag bags will remain closed. One end/face of the ag bag that is actively being used to prepare feed rations must remain open to allow extraction of the silage. A front-end loader is used to extract silage from the open face of the ag bag throughout the day as the feed rations for the various groups or categories of cows are prepared. Emissions from the ag bags are associated with this open face, which is exposed to the atmosphere and frequently disturbed during silage extraction. Due to the need to access the ag bag's open face throughout the day, it is not practical to enclose it or equip it with any kind of device or system that could be used to capture emissions.

TMR is prepared by mixing silage with various additives such as seeds, grains, and molasses. Because the quality of silage degrades fairly rapidly upon exposure to air, TMR is prepared only when needed and promptly distributed to the feed lanes for consumption. Most of the TMR emissions are thus emitted from the feed lanes, which are located inside the housing barns, where the TMR will remain exposed to the air for at least several hours as the cows feed. As previously discussed, collection and control of emissions from housing barns is not only impractical but also cost prohibitive.

The District therefore determines that emissions from feed handling and storage cannot reasonably be captured, and are to be considered fugitive.

As previously stated, emissions from liquid manure lagoons and storage ponds have already been determined to be non-fugitive. The facility's non-fugitive stationary source potential emissions are summarized in the following tables:

Non-Fugitive SSPE1 (lb/year)					
Category	NO_x	SO_x	PM₁₀	CO	VOC
N-6208-3-2 - Lagoons only	0	0	0	0	2,522 ¹¹
N-6208-5-0 - Engine	882	0	44	268	101
N-6208-6-0 - GDO	0	0	0	0	59
Non-Fugitive SSPE1	882	0	44	268	2,682

Non-Fugitive SSPE2 (lb/year)					
Category	NO_x	SO_x	PM₁₀	CO	VOC
N-6208-3-3 - Lagoons only	0	0	0	0	2,623 ¹²
N-6208-5-0 - Engine	882	0	44	268	101
N-6208-6-0 - GDO	0	0	0	0	59
Non-Fugitive SSPE2	882	0	44	268	2,783

¹¹ From Appendix E - 'Pre-Project Potential to Emit (PE1)' sheet

¹² From Appendix E - 'Post-Project Potential to Emit (PE2)' sheet

The Rule 2201 major source determination is summarized in the following table:

Rule 2201 Major Source Determination						
Category	NO_x	SO_x	PM₁₀	PM_{2.5}	CO	VOC
SSPE1 (lb/yr)	882	0	44	44	268	2,682
SSPE2 (lb/yr)	882	0	44	44	268	2,783
Major source threshold (lb/yr)	20,000	140,000	140,000	200,000	200,000	20,000
Major Source? (Y/N)	N	N	N	N	N	N

Note: PM_{2.5} assumed to be equal to PM₁₀

As shown in the table above, the facility is not an existing major source and is not becoming a major source as a result of this project.

Rule 2410 Major Source Determination

In determining if a stationary source is a PSD major source, the following sources of emissions shall not be included:

- Emissions from non-road engines (i.e. engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the source categories specified in 40 CFR 52.21(b)(1)(iii)

Agricultural operations do not belong to any of the source categories specified in specified in 40 CFR 52.21(b)(1)(i). Since this facility is an agricultural operation, fugitive emissions shall not be included in determining whether it is a PSD major source; and the PSD major source threshold is 250 tons/yr (tpy) for any regulated NSR pollutant.

The non-fugitive stationary source emissions from the preceding section have been converted into tons.¹³ The PSD major source determination is summarized in the following table:

PSD Major Source Determination						
Category	NO₂	VOC	SO₂	CO	PM	PM₁₀
Estimated facility PE before project increase (tpy)	0.441	1.341	0.000	0.134	0.022	0.022
PSD major source threshold (tpy)	250	250	250	250	250	250
PSD major source? (Y/N)	N	N	N	N	N	N

As shown above, the facility is not an existing major source for PSD for at least one pollutant. Therefore the facility is not an existing major source for PSD.

¹³ (lb/yr) / (2,000 lb/ton) = tons/yr (tpy).

6. Baseline Emissions (BE)

The BE calculations are performed, pollutant by pollutant, for each emissions unit involved in the project. The BE are subsequently used to calculate the quarterly net emissions change (QNEC), and if applicable, to determine the amount of offsets required.

Pursuant to District Rule 2201, $BE = PE1$ for:

- Any unit located at a non-major source,
- Any highly-utilized emissions unit located at a major source,
- Any fully-offset emissions unit located at a major source, or
- Any clean emissions unit located at a major source.

Otherwise,

$BE =$ historic actual emissions (HAE), calculated pursuant to District Rule 2201.

Since this facility is not a major source for any pollutants, $BE = PE1$.

Additionally, agricultural operations that are not major sources are exempt from offsets pursuant to Section 4.6.9 of District Rule 2201.

7. SB 288 Major Modification

SB 288 major modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since this facility is not a major source for any of the pollutants addressed in this project, the project does not constitute an SB 288 major modification.

8. Federal Major Modification

District Rule 2201, Section 3.18, states that federal major modifications are the same as "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

Since this facility is not a major source for any pollutant, this project does not constitute a federal major modification.

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination for sources located in the San Joaquin Valley and which are involved in this project are:¹⁴

¹⁴ See 52.21(b)(23) - definition of significant

- PM
- PM₁₀
- Hydrogen sulfide (H₂S)
- Total reduced sulfur (including H₂S)

Project Emissions Increase - New Major Source Determination

The post-project potentials to emit (PE) from all new and modified units are compared to the PSD major source thresholds to determine if the project constitutes a new major source subject to PSD requirements.

Agricultural operations do not belong to any of the source categories specified in specified in 40 CFR 52.21(b)(1)(i). Since this facility is an agricultural operation, fugitive emissions shall not be included in determining whether it is a PSD major source; and the PSD major source threshold is 250 tons/yr (tpy) for any regulated NSR pollutant.

The non-fugitive stationary source emissions from Section VII.C.5 have been converted into tons. The PSD applicability determination is summarized in the following table:

PSD Applicability Determination - New Major Source				
Category	PM	PM₁₀	H₂S	S
Total PE from new and modified units (tpy)	0	0	0.217	0.217
PSD major source threshold (tpy)	250	250	250	250
New PSD major source? (Y/N)	N	N	N	N

As shown in the table above, the PE for the proposed project, by itself, does not exceed any PSD major source threshold. Rule 2410 is therefore not applicable and no further analysis is required.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS database (emissions profile screen). Detailed QNEC calculations are included in Appendix J.

VIII. Compliance

Rule 1070 Inspections

This rule requires the District to perform inspections for the purpose of obtaining information necessary to determine whether air pollution sources are in compliance with applicable rules and regulations. The rule also authorizes the District to require record keeping, to make inspections and to conduct tests of air pollution sources. The following conditions will be placed on each of the ATCs to ensure compliance:

- {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]

Rule 2010 Permits Required

The provisions of this rule apply to any person who plans to or does operate, construct, alter, or replace any source operation which may emit air contaminants or may reduce the emission of air contaminants.

Pursuant to Section 3.0, any person building, altering or replacing any operation, article, machine, equipment, or other contrivance, the use of which may cause the issuance of air contaminants or the use of which may eliminate or reduce or control the issuance of air contaminants, shall first obtain authorization for such construction from the APCO. An Authority to Construct shall remain in effect until the Permit to Operate the source operation for which the application was filed is granted or denied, or the application is canceled as described in Rule 2050 (Cancellation of Application).

Pursuant to Section 4.0, before any new or modified source operation described in Section 3.0, or any existing source operation so described may be operated, a written permit shall be obtained from the APCO. No Permit to Operate shall be granted either by the APCO or the Hearing Board for any source operation described in Section 3.0 constructed or installed without authorization as required by Section 3.0 until the information required is presented to the APCO and such source operation is altered, if necessary, and made to conform to the standards set forth in Rule 2070 (Standards for Granting Applications) and elsewhere in these rules and regulations.

The facility has obtained a Permit to Operate for the existing operation, and has submitted an Authority to Construct permit application for the proposed modifications. Continued compliance with the requirements of this rule is therefore expected.

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions*:

- a. Any new emissions unit with a potential to emit exceeding two pounds per day,
- b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
- c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an AIPE exceeding two pounds per day, and/or
- d. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

* Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

As previously discussed, the proposed dairy expansion includes the construction of several new emissions units. As shown in the dairy emissions calculation spreadsheets in Appendix E, the PE for the new freestall #8 exceeds 2 lb/day for VOC, NH₃, and PM₁₀, and the PE for the new anaerobic lagoon exceeds 2 lb/day for VOC and NH₃. BACT for new emissions units with PE > 2 lb/day is therefore triggered, as summarized below:

N-6208-2-3: Cow Housing (New)

Freestall Barn #8: VOC, NH₃, and PM₁₀

N-6208-3-3: Liquid Manure Handling (New)

Anaerobic lagoon: VOC and NH₃

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore BACT is not triggered for relocation of an emissions unit.

c. Modification of emissions units – AIPE > 2 lb/day

$$\text{AIPE} = \text{PE2} - \text{HAPE}$$

Where,

AIPE = Adjusted Increase in Permitted Emissions, (lb/day)

PE2 = Post-Project Potential to Emit, (lb/day)

HAPE = Historically Adjusted Potential to Emit, (lb/day)

$$\text{HAPE} = \text{PE1} \times (\text{EF2}/\text{EF1})$$

Where,

PE1 = The emissions unit's PE prior to modification or relocation, (lb/day).

EF2 = The emissions unit's permitted emission factor for the pollutant after modification or relocation. If EF2 is greater than EF1 then EF2/EF1 shall be set to 1.

EF1 = The emissions unit's permitted emission factor for the pollutant before the modification or relocation.

$$\text{AIPE} = \text{PE2} - (\text{PE1} \times (\text{EF2} / \text{EF1}))$$

Detailed AIPE calculations for each emissions unit are shown in Appendix E. The AIPE is greater than 2 lb/day, and therefore BACT is triggered, for the emissions units and pollutants summarized below:

N-6208-2-3: Cow Housing

Freestall barns #6 and #7: VOC and NH₃

N-6208-3-3: Liquid Manure Handling

Lagoons/storage ponds: VOC and NH₃
Liquid manure land application: VOC and NH₃

N-6208-4-3: Solid Manure Handling

Solid manure storage: NH₃
Solid manure land application: NH₃

N-6208-7-2: Feed Storage and Handling

Total mixed ration (TMR) feeding: VOC

d. SB 288/Federal Major Modification

As discussed in Sections VII.C.7 and VII.C.8 of this evaluation, this project does not constitute an SB 288 and/or federal major modification. BACT is therefore not triggered under this category.

2. Top-Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the attached Top-Down BACT Analysis (see Appendix F), BACT for the project has been satisfied with the following:

Cow Housing (ATC N-6208-2-3)

Freestall #8

- PM₁₀: 1) Concrete feed lanes and walkways; and
2) Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions.

Freestall Barns #6, #7 and #8

- VOC: 1) Concrete feed lanes and walkways;
2) Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
3) Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;
4) Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage;
5) Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions; and
6) District Rule 4570 mitigation measures.

- NH₃: 1) Concrete feed lanes and walkways;
2) Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
3) Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;
4) Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage; and
5) Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions.

Liquid Manure Handling System (ATC N-6208-3-3)

Liquid Manure Management

VOC: Anaerobic treatment lagoon designed according to Natural Resources Conservation Service (NRCS) guideline, and solids separation/removal system (mechanical separator(s) or settling basin(s)/weeping wall(s)).

NH₃: All animals fed in accordance with NRC or other District-approved guidelines.

Land Application of Liquid/Slurry Manure

VOC: Irrigation of crops using liquid/slurry manure from the secondary lagoon/holding/storage pond preceded by an uncovered anaerobic treatment lagoon designed to meet Natural Resources Conservation Service (NRCS) standards.

NH₃: All animals fed in accordance with NRC or other District-approved guidelines.

Solid Manure Handling System (ATC N-6208-4-3)

Solid Manure Management - Storage and Separated Solids

NH₃: All animals fed in accordance with NRC or other District-approved guidelines.

Land Application of Solid Manure

NH₃: Solid manure incorporated into the soil within two hours of land application and all animals fed in accordance with NRC or other District-approved guidelines.

Feed Storage and Handling – Feed/TMR (ATC N-6208-7-2)

Total Mixed Ration (TMR) feeding

VOC: Implement District Rule 4570 management practices for feed.

B. Offsets

Offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201. As shown in the table below, the SSPE2 is compared to the offset thresholds. VOC emissions exceed the offset threshold; however, per Section 4.6.9, offsets are not required for agricultural sources unless they are a major source. As determined in Section VII.C.5 above, this facility is not a major source for any pollutant. Therefore, offsets are not required.

Offset Determination (lb/year)					
	NO _x	SO _x	PM ₁₀	CO	VOC
SSPE2	882	0	6,484	268	83,160
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	No	No	No	No	Yes

C. Public Notification

1. Applicability

Public noticing is required for:

- a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,

- b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
- c. Any project which results in the offset thresholds being surpassed,
- d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant, and/or
- e. Any project which results in a Title V significant permit modification.

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

As demonstrated in Sections VII.C.7 and VII.C.8 of this evaluation, this project does not constitute a SB 288 or federal major modification. Public notice for SB 288 or federal major modification purposes is not therefore required.

b. PE > 100 lb/day

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements.

As shown in the calculations in Appendix E, this project does not include any new emissions units with a PE > 100 lb/day for any pollutant. Public notice is therefore not required under this category.

c. Offset Threshold

The SSPE1 and SSPE2 are compared to the offset thresholds in the following table.

Offset Threshold				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO _x	882	882	20,000 lb/year	No
SO _x	0	0	54,750 lb/year	No
PM ₁₀	14,515	6,484	29,200 lb/year	No
CO	268	268	200,000 lb/year	No
VOC	66,376	83,160	20,000 lb/year	No

As shown above, no offset thresholds are surpassed due to this project. Public notice for offset threshold purposes is therefore not required.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE = SSPE2 – SSPE1. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table.

Stationary Source Increase in Permitted Emissions [SSIPE] – Public Notice					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO _x	882	882	0	20,000 lb/year	No
SO _x	0	0	0	20,000 lb/year	No
PM ₁₀	6,484	14,515	-8,031	20,000 lb/year	No
CO	268	268	0	20,000 lb/year	No
VOC	83,160	66,376	16,784	20,000 lb/year	No
NH ₃	105,934	60,162	45,772	20,000 lb/year	Yes
H ₂ S	433	235	198	20,000 lb/year	No

As demonstrated above, the SSIPE for NH₃ is greater than 20,000 lb/year; therefore public noticing for SSIPE purposes is required.

e. Title V Significant Permit Modification

Since this facility does not have a Title V operating permit, this project cannot constitute a Title V significant permit modification. Public noticing is therefore not required under this category.

2. Public Notice Action

As discussed above, public notice is required for this project. Public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be published in a local newspaper of general circulation in Stanislaus County prior to the issuance of the ATC permits.

D. Daily Emission Limits (DELs)

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

For dairies, the DEL is satisfied based on the number and age categories of animals at the dairy and the required emission controls and mitigation measures. The number and age categories of animals are listed in the permit equipment description for the Cow Housing (Permit N-6208-2).

Milking Parlor (N-6208-1-3)

The following condition will be placed on the ATC:

- {modified 4484} Permittee shall flush or hose milk parlor immediately prior to, immediately after, or during each milking. [District Rules 2201 and 4570]

Cow Housing (N-6208-2-3)

The equipment description stating the number of animals allowed at the dairy will enforce the DEL.

Additionally, the following conditions will be placed on the ATC to ensure that the DEL and BACT requirements are met:

- The maximum numbers of heifers shall not exceed either of the following limits: 275 large heifers (15 - 24 months) and 520 small heifers (4 - 6 months). [District Rule 2201]
- The number of calves may exceed 600 as long as the total number of support stock (heifers and calves) does not exceed 1,395, and there is no increase in the number of hutches or corrals. [District Rule 2201]
- Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4102]
- {modified 4486} Permittee shall pave feedlanes for a width of at least 8 feet along the housing side of the feedlane fence for mature cows and at least 6 feet along the housing side of the feedlane fence for heifers. [District Rules 2201, 4102, and 4570]
- {modified 4487} Permittee shall flush, scrape or vacuum freestall lanes immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
- {modified 4487} For Freestall Barns #6 through #8, permittee shall flush lanes at least four times per day. [District Rules 2201, 4102, and 4570]
- {modified 4492} Permittee shall remove manure that is not dry from individual cow freestall beds or shall rake, harrow, scrape, or grade freestall bedding at least once every seven (7) days. [District Rules 2201, 4102, and 4570]
- {modified 4499} Permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4501} Permittee shall clean manure from corrals at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean corrals at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
- {modified 4554} Permittee shall implement at least one of the following mitigation measures: 1) slope the surfaces of exercise pens/corrals at least 3% where the available space for each animal is 400 square feet or less and at least 1.5% where the available space for each animal is more than 400 square feet per animal; 2) maintain exercise pens/corrals to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape exercise pens/corrals sufficiently to maintain a dry surface except during periods of rainy weather. [District Rules 2201, 4102, and 4570]

- {modified 4508} Permittee shall scrape, vacuum or flush concrete lanes in corrals at least once every day for mature cows and every seven (7) days for support stock. [District Rules 2201 and 4570]
- For Freestall Barns #6 through #8, permittee shall scrape exercise pen surfaces every two weeks using a pull-type scraper during morning hours, except when prevented by wet conditions. [District Rules 2201 and 4102]
- {modified 4518} Permittee shall manage corrals such that the manure depth in the corral does not exceed twelve (12) inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible. [District Rules 2201, 4102, and 4570]

Liquid Manure Handling System (N-6208-3-3)

The following conditions will be placed on the ATC to ensure that the DEL requirements are met:

- Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4102]
- All liquid manure shall be treated in an anaerobic treatment lagoon system that is designed and operated according to the Natural Resources Conservation Service (NRCS) Field Office Technical Guide No. 359. [District Rules 2201 and 4102]
- {modified 4538} Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rules 2201, 4102, and 4570]
- Any liquid manure applied to land shall have been treated in an anaerobic treatment lagoon system that is designed and operated according to the NRCS Field Office Technical Guide No. 359. [District Rule 2201]
- {modified 4550} Permittee shall not allow liquid manure to stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]
- The concentration of undissociated hydrogen sulfide (undissociated H₂S concentration) in the surface layer of the anaerobic lagoon shall not exceed 5.0 mg/L during any calendar quarter. The undissociated H₂S concentration shall be determined using the measured values for the total sulfide concentration, pH, and temperature. The fraction of total sulfide that is undissociated H₂S shall be calculated using one of the following methods: 1) the formula $(10^{-\text{pH}})/(10^{-\text{pH}} + K_{a1})$, where K_{a1} is the temperature-adjusted dissociation constant for H₂S; 2) the procedures outlined in Standard Method 4500-S₂-H; or 3) other procedures approved by the District. [District Rules 2201 and 4102]
- The permittee shall measure and record the total sulfide concentration, pH, and temperature of the surface layer of the anaerobic lagoon, and shall determine the

undissociated H₂S concentration, at least once every calendar quarter, with at least 30 days between quarterly measurements, and at other times as may be requested by the District. If measurement samples cannot be safely obtained directly from the surface layer of the lagoon, then samples obtained by alternative methods, such as pump or flush valve discharge, may be used. [District Rules 2201 and 4102]

- If the undissociated H₂S concentration exceeds the permit limit, then the permittee shall measure and record the total sulfide concentrations, pH, and temperatures, and shall determine the undissociated H₂S concentrations, from at least two other areas of the lagoon's surface layer, as soon as possible, but not longer than 24 hours after results from the initial measurements indicated a potential exceedance. The undissociated H₂S concentration determined from the initial measurements and the undissociated H₂S concentrations determined from the secondary measurements shall be averaged. If the resulting average undissociated H₂S concentration exceeds the permit limit, then the permittee shall measure and record the total sulfide concentration, pH, and temperature of the surface layer of the lagoon, and shall determine the undissociated H₂S concentration, at least once every month. Once compliance with the undissociated H₂S concentration permit limit has been demonstrated for three consecutive months, the monitoring frequency may return to once every calendar quarter. [District Rules 2201 and 4102]
- If the lagoon's liquid depth does not exceed 5 feet throughout the monitoring period (quarter or month), then the undissociated H₂S concentration shall be considered negligible, in which case measurements of the total sulfide concentration, pH, and temperature shall not be required, provided records of the lagoon's liquid depth are maintained. The District may also approve alternative monitoring frequencies and/or parameters. [District Rules 2201 and 4102]
- Measurement of the total sulfide concentration shall be performed using any of the following methods: 1) a sulfide test kit; 2) a sulfide meter; 3) procedures of an accredited lab; 4) Standard Method 4500-S₂; 5) ASTM D4658; 6) USGS Method I-3840; 7) EPA Method 376.2; 8) Marine Pollution Studies Laboratory (MPSL) Standard Operating Procedure for measurement of sulfide; or 9) other methods approved by the District. [District Rules 2201 and 4102]

Solid Manure Handling System (N-6208-4-3)

The following conditions will be placed on the ATC:

- Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rule 2201]
- {modified 4526} Within seventy two (72) hours of removal of solid manure from housing, permittee shall either 1) remove dry manure from the dairy, or 2) cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed twenty-four (24) hours per event. [District Rules 2201 and 4570]
- {modified 4541} Solid manure shall be incorporated into the soil within two hours of land application. [District Rules 2201 and 4570]

Feed Storage and Handling System (N-6208-7-2)

The following conditions will be placed on the ATC:

- Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- {modified 4456} Permittee shall push feed so that it is within three feet of feedlane fence within two hours of putting out the feed or use a feed trough or other feeding structure designed to maintain feed within reach of the animals. [District Rules 2201 and 4570]
- {modified 4458} Permittee shall begin feeding total mixed rations within two hours of grinding and mixing rations. [District Rules 2201 and 4570]
- {modified 4460} Permittee shall store grain in a weatherproof storage structure or under a weatherproof covering from October through May. [District Rules 2201 and 4570]
- {modified 4462} Permittee shall feed steam-flaked, dry rolled, cracked or ground corn or other steam-flaked, dry rolled, cracked or ground cereal grains. [District Rules 2201 and 4570]
- Permittee shall only utilize ag bags for silage/feedstuff. [District Rules 2201 and 4570]
- Only three of the ag bags shall have an open face at any time. All other ag bags shall remain closed. [District Rule 2201]

E. Compliance Assurance

1. Source Testing

Pursuant to District Policy APR 1705, source testing is not required to demonstrate compliance with Rule 2201.

2. Monitoring

No monitoring is required for the proposed project.

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the public notification and daily emission limit requirements of Rule 2201. In general, recordkeeping for the Milking Parlor (N-6208-1), the Liquid Manure Handling System (N-6208-3), and the Solid Manure Handling System (N-6208-4) and the Feed Storage and Handling System (N-6208-7) is satisfied with the records that must be kept to demonstrate compliance with the numbers and types of cows listed in the permit equipment description for the

Cow Housing (N-6208-2). Conditions that will be placed on the ATC permits are listed below.

Additional recordkeeping conditions are included under the Rule 4570 compliance section.

Milking Parlor (N-6208-1)

The following conditions will be placed on the ATC:

- {modified 4485} Permittee shall provide verification that milk parlor is flushed or hosed down immediately prior to, immediately after, or during each milking. [District Rules 2201 and 4570]
- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]

Cow Housing (N-6208-2)

The following conditions will appear on the ATC for the Cow Housing Permit:

- Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4102]
- {modified 4488} Permittee shall maintain records sufficient to demonstrate that freestall lanes are flushed, scraped or vacuumed immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
- {modified 4488} For Freestall Barns #6 through #8, permittee shall maintain records sufficient to demonstrate that lanes are flushed at least four times per day. [District Rules 2201, 4102, and 4570]
- {modified 4493} Permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow freestall beds or 2) the dates when the freestall bedding is raked, harrowed, scraped, or graded. [District Rules 2201, 4102, and 4570]
- {modified 4500} Permittee shall maintain records demonstrating that water pipes and troughs are inspected and leaks are repaired at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4501} Permittee shall clean manure from corrals at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean corrals at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]

- {modified 4502} Permittee shall demonstrate that manure from corrals are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that corrals are cleaned at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
- {modified 4555} Permittee shall either 1) maintain sufficient records to demonstrate that exercise pens/corrals are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours; or 2) maintain records of dates when exercise pens/corrals are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rules 2201, 4102, and 4570]
- {modified 4556} Permittee shall maintain records demonstrating that concrete lanes in corrals are scraped, vacuumed, or flushed at least once every day for mature cows and at least once every seven (7) days for support stock. [District Rules 2201 and 4570]
- For Freestall Barns #6 through #8, permittee shall maintain sufficient records to demonstrate that exercise pen surfaces are scraped every two weeks using a pull-type scraper during morning hours, except when prevented by wet conditions. [District Rules 2201 and 4102]
- {modified 4449} Permittee shall maintain a record of the number of animals of each species and production group at the facility and shall maintain quarterly records of any changes to this information. [District Rules 2201, 4102, and 4570]
- {modified 4519} Permittee shall measure and document the depth of manure in the corrals at least once every ninety (90) days. [District Rules 2201, 4102, and 4570]
- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201, 4102, and 4570]

Liquid Manure Handling System (N-6208-3)

To ensure that the lagoon system is designed and operating properly, the following conditions will be placed on the ATC for the Liquid Manure Handling System:

- Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4102]
- Permittee shall maintain design specifications and calculations, including minimum treatment volume (MTV) and hydraulic retention time (HRT) calculations, demonstrating that the anaerobic treatment lagoon system meets the requirements listed in the NRCS Field Office Technical Guide No. 359. [District Rules 2201 and 4102]

- Permittee shall maintain records to demonstrate that liquid manure applied to land has been treated in an anaerobic treatment lagoon system that is designed and operated according to the NRCS Field Office Technical Guide No. 359. [District Rule 2201]
- {modified 4551} Permittee shall maintain records to demonstrate liquid manure did not stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]
- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201, 4102, and 4570]

Solid Manure Handling System (N-6208-4)

The following conditions will be placed on the ATC:

- Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rule 2201]
- {modified 4527} Permittee shall keep records of dates when manure is removed from the dairy or permittee shall maintain records to demonstrate that dry manure piles outside the pens are covered with a weatherproof covering from October through May. [District Rules 2201 and 4570]
- {modified 4528} If weatherproof coverings are used, permittee shall maintain records, such as manufacturer warranties or other documentation, demonstrating that the weatherproof covering over dry manure are installed, used, and maintained in accordance with manufacturer recommendations and applicable standards listed in NRCS Field Office Technical Guide Code 313 or 367, or any other applicable standard approved by the APCO, ARB, and EPA. [District Rules 2201 and 4570]
- {modified 4542} Permittee shall maintain records to demonstrate that solid manure has been incorporated into the soil within two hours of land application. [District Rules 2201 and 4570]
- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]

Feed Storage and Handling System (N-6208-7)

The following conditions will be placed on the ATC:

- {modified 4455} Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]

- {modified 4457} Permittee shall maintain an operating plan/record that requires feed to be pushed within three feet of feedlane fence within two hours of putting out the feed, or use of a feed trough or other structure designed to maintain feed within reach of the animals. [District Rules 2201 and 4570]
- {modified 4459} Permittee shall maintain an operating plan/record of when feeding of total mixed rations began within two hours of grinding and mixing rations. [District Rules 2201 and 4570]
- {modified 4461} Permittee shall maintain records demonstrating grain is/was stored in a weatherproof storage structure or under a weatherproof covering from October through May. [District Rules 2201 and 4570]
- {modified 4463} Permittee shall maintain records to demonstrate animals are fed steam-flaked, dry rolled, cracked or ground corn or other steam-flaked, dry rolled, cracked or ground cereal grains. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
- Permittee shall maintain records of each ag bag and records of the last delivery and bagging of material to ag bag. Documents from contractor(s) containing this information are acceptable. [District Rule 2201]
- Permittee shall maintain records of the dates in which any ag bag with an open face is being used. [District Rules 2201 and 4570]
- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]

The permit units are also subject to the recordkeeping requirements of District Rule 4570, *Confined Animal Facilities*, which will be discussed under the Rule 4570 section below.

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis

Section 4.14 of Rule 2201 requires that an ambient air quality analysis (AAQA) be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The District's Technical Services Division conducted the required analysis. Refer to Appendix G of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO₂, CO, and SO₂. As shown by the AAQA summary sheet the proposed equipment will not cause or contribute significantly to a violation of any state or national ambient air quality standard.

The proposed location is in a non-attainment area for the state's PM₁₀ standard as well as federal and state PM_{2.5} standards.

Rule 2410 Prevention of Significant Deterioration

As shown in Section VII.C.9 of this evaluation, the proposed project does not result in a new PSD major source or PSD major modification. The project is therefore not subject to the requirements of this rule.

Rule 2520 Federally Mandated Operating Permits

Since this facility's potential emissions do not exceed any major source thresholds of Rule 2201, this facility is not a major source, and Rule 2520 does not apply.

Rule 4101 Visible Emissions

Section 5.0 stipulates that no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour, which is as dark as or darker than Ringelmann 1 (or 20% opacity).

Pursuant to Section 4.12, emissions subject to or specifically exempt from Regulation VIII (Fugitive PM₁₀ Prohibitions) are considered to be exempt.

Pursuant to District Rule 8081, Section 4.1, on-field agricultural sources are exempt from the requirements of Regulation VIII.

An on-field agricultural source is defined in Rule 8011, Section 3.35 as the following:

- Activities conducted solely for the purpose of preparing land for the growing of crops or the raising of fowl or animals, such as brush or timber clearing, grubbing, scraping, ground excavation, land leveling, grading, turning under stalks, disking, or tilling;

The units involved in this project are used solely for the raising of dairy animals. Therefore, these units are exempt from the provisions of this rule.

Rule 4102 Nuisance

Rule 4102 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. According to the District's records, there have been no public nuisance complaints or violations associated with the operations of this facility.

Since the proposed modifications do not fundamentally alter the nature of the facility's operations, continued compliance with the requirements of this rule is expected.

California Health and Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – *Risk Management Policy for Permitting New and Modified Sources* specifies that for an increase in emissions associated with a proposed new source

or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (Appendix G), the total facility prioritization score including this project was greater than one. Therefore, a HRA was required to determine the short-term acute and long-term chronic exposure from this project.

Risk Management Review (RMR) Summary							
Categories	Milking Operation (N-6208-1-3)	Cow Housing (N-6208-2-3)	Liquid Manure (N-6208-3-3)	Solid Manure (N-6208-4-3)	Feed Handling (N-6208-7-2)	Project Totals	Facility Totals
Prioritization Score	1.56	51.3	49.6	0.47	N/A ²	>1	>1
Acute Hazard Index	0.00	0.2	0.38 ¹	0.03	N/A ²	0.62 ¹	0.62 ¹
Chronic Hazard Index	0.00	0.16	0.00	0.00	N/A ²	0.18	0.18
Maximum Individual Cancer Risk	1.94E-06	11.0E-06	1.94E-06	N/A	N/A²	13.4E-06	13.4E-06
T-BACT Required?	Yes-VOC's	See Conclusion*	Yes-VOC's	No	No		
Special Permit Conditions?	No	No	No	No	No		

* TBACT is determined on a corral by corral basis. TBACT for the Cow Housing was addressed in the conclusions section of the RMR report.

¹ Risk total includes the acute risk from the Dairy H₂S Calculator.

² No prioritization or further review was required for Unit -7-2 (feed storage & handling).

Discussion of T-BACT

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is required for this project because the HRA indicates that the risk is above the District's thresholds for triggering T-BACT requirements.

T-BACT is triggered for VOC from the milking parlor, cow housing (Freestall Barn #7), and liquid manure handling. T-BACT is satisfied with BACT for VOC (see Appendix F for BACT analysis for applicable toxic emission control). Compliance with the District's Risk Management Policy is therefore expected.

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification not have acute or chronic indices, or a cancer risk greater than the District's significance levels (i.e. acute and/or chronic indices greater than 1 and a cancer risk greater than 20 in a million). As outlined by the HRA Summary in Appendix G of this report, the emissions increases for this project was determined to be less than significant.

Per the RMR summary and to ensure that human health risks will not exceed District allowable levels, the following requirement shall be included on the permit:

- The quarterly H₂S concentration cannot exceed 5.0 mg/L.

Therefore, the following conditions will be included on the ATC C-6208-3-3 to enforce the above requirement:

- The concentration of undissociated hydrogen sulfide (undissociated H₂S concentration) in the surface layer of the anaerobic lagoon shall not exceed 5.0 mg/L during any calendar quarter. The undissociated H₂S concentration shall be determined using the measured values for the total sulfide concentration, pH, and temperature. The fraction of total sulfide that is undissociated H₂S shall be calculated using one of the following methods: 1) the formula $(10^{-\text{pH}})/(10^{-\text{pH}} + K_{a1})$, where K_{a1} is the temperature-adjusted dissociation constant for H₂S; 2) the procedures outlined in Standard Method 4500-S₂-H; or 3) other procedures approved by the District. [District Rules 2201 and 4102]
- The permittee shall measure and record the total sulfide concentration, pH, and temperature of the surface layer of the anaerobic lagoon, and shall determine the undissociated H₂S concentration, at least once every calendar quarter, with at least 30 days between quarterly measurements, and at other times as may be requested by the District. If measurement samples cannot be safely obtained directly from the surface layer of the lagoon, then samples obtained by alternative methods, such as pump or flush valve discharge, may be used. [District Rules 2201 and 4102]
- If the undissociated H₂S concentration exceeds the permit limit, then the permittee shall measure and record the total sulfide concentrations, pH, and temperatures, and shall determine the undissociated H₂S concentrations, from at least two other areas of the lagoon's surface layer, as soon as possible, but not longer than 24 hours after results from the initial measurements indicated a potential exceedance. The undissociated H₂S concentration determined from the initial measurements and the undissociated H₂S concentrations determined from the secondary measurements shall be averaged. If the resulting average undissociated H₂S concentration exceeds the permit limit, then the permittee shall measure and record the total sulfide concentration, pH, and temperature of the surface layer of the lagoon, and shall determine the undissociated H₂S concentration, at least once every month. Once compliance with the undissociated H₂S concentration permit limit has been demonstrated for three consecutive months, the monitoring frequency may return to once every calendar quarter. [District Rules 2201 and 4102]
- If the lagoon's liquid depth does not exceed 5 feet throughout the monitoring period (quarter or month), then the undissociated H₂S concentration shall be considered negligible, in which case measurements of the total sulfide concentration, pH, and temperature shall not be required, provided records of the lagoon's liquid depth are maintained. The District may also approve alternative monitoring frequencies and/or parameters. [District Rules 2201 and 4102]
- Measurement of the total sulfide concentration shall be performed using any of the following methods: 1) a sulfide test kit; 2) a sulfide meter; 3) procedures of an accredited lab; 4) Standard Method 4500-S₂; 5) ASTM D4658; 6) USGS Method I-3840; 7) EPA Method 376.2; 8) Marine Pollution Studies Laboratory (MPSL) Standard

Operating Procedure for measurement of sulfide; or 9) other methods approved by the District. [District Rules 2201 and 4102]

Additional monitoring parameters and recordkeeping were added under the Rule 2201 discussion.

Rule 4550 Conservation Management Practices (CMP)

This rule applies to agricultural operation sites located within the San Joaquin Valley Air Basin. The purpose of this rule is to limit fugitive dust emissions from agricultural operation sites.

Pursuant to Section 5.1, effective on and after July 1, 2004, an owner/operator shall implement the applicable CMPs selected pursuant to Section 6.2 for each agricultural operation site.

Pursuant to Section 5.2, an owner/operator shall prepare and submit a CMP application for each agricultural operation site to the APCO for approval.

Trinkler Dairy received District approval for its current CMP plan on August 14, 2014. The proposed project does not involve any changes or modifications to the CMP plan. Continued compliance with the requirements of this rule is therefore expected.

Rule 4570 Confined Animal Facilities (CAF)

This rule applies to Confined Animal Facilities (CAF) located within the San Joaquin Valley Air Basin. The purpose of this rule is to limit emissions of Volatile Organic Compounds (VOC) from through the implementation of various mitigation measures for each emissions unit.

The facility was issued ATC permits to implement the requirements of this rule under project N-1110993. The applicant has not proposed any changes to the previously selected mitigation measures. The permit conditions from the current permits (project N-1110993) will therefore be carried over onto the ATC permits under this project.

General Condition on all ATCs

- {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the permittee shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]

Milking Parlor (N-6208-1)

- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201, 4102, and 4570]

Cow Housing (N-6208-2)

- {modified 4486} Permittee shall pave feedlanes for a width of at least 8 feet along the housing side of the feedlane fence for mature cows and at least 6 feet along the housing side of the feedlane fence for heifers. [District Rules 2201, 4102, and 4570]
- {modified 4487} Permittee shall flush, scrape or vacuum freestall lanes immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
- {modified 4488} Permittee shall maintain records sufficient to demonstrate that freestall lanes are flushed, scraped or vacuumed immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
- {modified 4492} Permittee shall remove manure that is not dry from individual cow freestall beds or rake, harrow, scrape, or grade freestall bedding at least once every seven (7) days. [District Rules 2201, 4102, and 4570]
- {modified 4493} Permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow freestall beds or 2) the dates when the freestall bedding is raked, harrowed, scraped, or graded. [District Rules 2201, 4102, and 4570]
- {modified 4499} Permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4500} Permittee shall maintain records demonstrating that water pipes and troughs are inspected and leaks are repaired at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4501} Permittee shall clean manure from corrals at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean corrals at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
- {modified 4502} Permittee shall demonstrate that manure from corrals are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that corrals are cleaned at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
- Permittee shall implement at least one of the following mitigation measures: 1) slope the surfaces of exercise pens/corrals at least 3% where the available space for each animal is 400 square feet or less and at least 1.5% where the available space for each animal is more than 400 square feet per animal; 2) maintain exercise pens/corrals to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape exercise pens/corrals sufficiently to maintain a dry surface except during periods of rainy weather.

- {modified 4555} Permittee shall either 1) maintain sufficient records to demonstrate that exercise pens/corrals are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours; or 2) maintain records of dates when exercise pens/corrals are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rules 2201, 4102, and 4570]
- {modified 4508} Permittee shall scrape, vacuum or flush concrete lanes in corrals at least once every day for mature cows and every seven (7) days for support stock. [District Rules 2201 and 4570]
- {modified 4556} Permittee shall maintain records demonstrating that concrete lanes in corrals are scraped, vacuumed, or flushed at least once every day for mature cows and at least once every seven (7) days for support stock. [District Rules 2201 and 4570]
- Permittee shall manage corrals such that the manure depth in the corral does not exceed twelve (12) inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible. [District Rules 2201, 4102, and 4570]
- Permittee shall measure and document the depth of manure in the corrals at least once every ninety (90) days. [District Rules 2201, 4102, and 4570]
- {modified 4449} Permittee shall maintain a record of the number of animals of each species and production group at the facility and shall maintain quarterly records of any changes to this information. [District Rules 2201, 4102, and 4570]
- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201, 4102, and 4570]

Additionally, the conditions below are on the current PTO N-6208-2-2. These conditions will not be transferred to the ATC because there are no new requirements for shade structures. There are only new roof structures being built for the new freestall barn and calf barn, and these conditions no longer apply.

- {4513} Shade structures shall be installed in any of the following ways: 1) constructed with a light permeable roofing material; 2) uphill of any slope in the corral; 3) installed so that the structure has a North/South orientation. OR Permittee shall clean manure from under corral shades at least once every fourteen (14) days, when weather permits access into the corral. [District Rule 4570]
- {4516} If permittee has selected to comply using shades constructed with a light permeable roofing material, then permittee shall maintain records, such as design specifications, demonstrating that the shade structures are equipped with such roofing material or if Permittee has selected to comply by cleaning the manure from under the corral shades, then Permittee shall maintain records demonstrating that manure is cleaned from under the shades

at least once every fourteen (14) days, as long as weather permits access to corrals. [District Rule 4570]

Liquid Manure Handling System (N-6208-3)

- {modified 4538} Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rules 2201, 4102, and 4570]
- {modified 4550} Permittee shall not allow liquid manure to stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]
- {modified 4551} Permittee shall maintain records to demonstrate liquid manure did not stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]
- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201, 4102, and 4570]

Solid Manure Handling System (N-6208-4)

- {modified 4526} Within seventy two (72) hours of removal of solid manure from housing, permittee shall either 1) remove dry manure from the dairy, or 2) cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed twenty-four (24) hours per event. [District Rules 2201 and 4570]
- {modified 4527} Permittee shall keep records of dates when manure is removed from the dairy or permittee shall maintain records to demonstrate that dry manure piles outside the pens are covered with a weatherproof covering from October through May. [District Rules 2201 and 4570]
- {modified 4528} If weatherproof coverings are used, permittee shall maintain records, such as manufacturer warranties or other documentation, demonstrating that the weatherproof covering over dry manure are installed, used, and maintained in accordance with manufacturer recommendations and applicable standards listed in NRCS Field Office Technical Guide Code 313 or 367, or any other applicable standard approved by the APCO, ARB, and EPA. [District Rules 2201 and 4570]
- {modified 4541} Solid manure shall be incorporated into the soil within two hours of land application. [District Rules 2201 and 4570]
- {modified 4542} Permittee shall maintain records to demonstrate that solid manure has been incorporated into the soil within two hours of land application. [District Rules 2201 and 4570]
- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]

Feed Storage and Handling System (N-6208-7)

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- {modified 4455} Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
- {modified 4456} Permittee shall push feed so that it is within three feet of feedlane fence within two hours of putting out the feed or use a feed trough or other feeding structure designed to maintain feed within reach of the animals. [District Rules 2201 and 4570]
- {modified 4457} Permittee shall maintain an operating plan/record that requires feed to be pushed within three feet of feedlane fence within two hours of putting out the feed, or use of a feed trough or other structure designed to maintain feed within reach of the animals. [District Rules 2201 and 4570]
- {modified 4458} Permittee shall begin feeding total mixed rations within two hours of grinding and mixing rations. [District Rules 2201 and 4570]
- {modified 4459} Permittee shall maintain an operating plan/record of when feeding of total mixed rations began within two hours of grinding and mixing rations. [District Rules 2201 and 4570]
- {modified 4460} Permittee shall store grain in a weatherproof storage structure or under a weatherproof covering from October through May. [District Rules 2201 and 4570]
- {modified 4461} Permittee shall maintain records demonstrating grain is/was stored in a weatherproof storage structure or under a weatherproof covering from October through May. [District Rules 2201 and 4570]
- {modified 4462} Permittee shall feed steam-flaked, dry rolled, cracked or ground corn or other steam-flaked, dry rolled, cracked or ground cereal grains. [District Rules 2201 and 4570]
- {modified 4463} Permittee shall maintain records to demonstrate animals are fed steam-flaked, dry rolled, cracked or ground corn or other steam-flaked, dry rolled, cracked or ground cereal grains. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]

According to the District's inspection records, this facility has been operating in compliance with Rule 4570 requirements. Since the proposed modifications do not fundamentally alter the nature of the facility's operations, continued compliance with the requirements of this rule is expected.

California Health and Safety Code 42301.6 (School Notice)

The District has verified that the proposed project site is not located within 1,000 feet of the outer boundaries of any K-12 schools. A school notice pursuant to California Health and Safety Code §42301.6 is therefore not required.

California Environmental Quality ACT (CEQA)

The California Environmental Quality Act (CEQA) requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The San Joaquin Valley Unified Air Pollution Control District (District) adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The County of Stanislaus (County) is the public agency having principal responsibility for approving the project. As such, the County served as the Lead Agency (CCR §15367). In approving the project, the Lead Agency prepared and adopted a Negative Declaration. The Lead agency filed a Notice of Determination, stating that the environmental document was adopted pursuant to the provisions of CEQA and concluding that the project would not have a significant effect on the environment.

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CCR §15381). As a Responsible Agency the District complies with CEQA by considering the environmental document prepared by the Lead Agency, and by reaching its own conclusion on whether and how to approve the project (CCR §15096).

The District has considered the Lead Agency's environmental document. Furthermore, the District has conducted an engineering evaluation of the project, this document, which demonstrates that Stationary Source emissions from the project would be below the District's thresholds of significance for criteria pollutants. Thus, the District finds that through a combination of project design elements, compliance with applicable District rules and regulations, and compliance with District air permit conditions, project specific stationary

source emissions will have a less than significant impact on air quality. The District does not have authority over any of the other project impacts and has, therefore, determined that no additional findings are required (CEQA Guidelines §15096(h)).

The following condition will be placed on all ATCs associated with this project:

- {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

Indemnification Agreement/Letter of Credit Determination

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit is based on a case-by-case analysis of a particular project's potential for litigation risk, which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

The criteria pollutant emissions and toxic air contaminant emissions associated with the proposed project are not significant. Therefore, an Indemnification Agreement and/or a Letter of Credit will not be required for this project in the absence of expressed public concern.

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Pending a successful Public Noticing period, issue Authorities to Construct N-6208-1-3, -2-3, -3-3, -4-3, & -7-2 subject to the permit conditions on the attached draft Authorities to Construct in Appendix B.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
N-6208-1-3	3020-06	Milking Center - Miscellaneous	\$116.00
N-6208-2-3	3020-06	Cow Housing - Miscellaneous	\$116.00
N-6208-3-3	3020-06	Liquid Manure Management - Miscellaneous	\$116.00
N-6208-4-3	3020-06	Solid Manure Management - Miscellaneous	\$116.00
N-6208-7-2	3020-06	Feed Storage and Handling - Miscellaneous	\$116.00

Appendixes

- A: Current Permits To Operate (N-6208-1-2, -2-2, -3-2, -4-2, & -7-1)
- B: Draft Authorities To Construct (N-6208-1-3, -2-3, -3-3, -4-3, & -7-2)
- C: Pre and Post-Project Site Plans
- D: Anaerobic Lagoon Design Check Spreadsheets
- E: Dairy Emissions Calculation Spreadsheets
- F: BACT Analysis for Dairy ATCs
- G: Summary of Health Risk Assessment (HRA) and Ambient Air Quality Analysis (AAQA)
- H: Stanislaus County #PLN2015-0019 – Use Permit
- I: Emission Calculations for N-6208-5-0 and -6-0
- J: Quarterly Net Emissions Change (QNEC)

APPENDIX A

**Current Permits to Operate
(N-6208-1-2, -2-2, -3-2, -4-2, & -7-1)**

San Joaquin Valley Air Pollution Control District

PERMIT UNIT: N-6208-1-2

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

1,400 COW MILKING OPERATION WITH ONE DOUBLE HERRINGBONE (21 STALL) MILK PARLOR

PERMIT UNIT REQUIREMENTS

1. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall flush or hose milk parlor immediately prior to, immediately after, or during each milking. [District Rule 4570]
5. Permittee shall provide verification that milk parlors are flushed or hosed prior to, immediately after, or during each milking. [District Rule 4570]
6. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rule 4570]
7. This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

These terms and conditions are part of the Facility-wide Permit to Operate.

San Joaquin Valley Air Pollution Control District

PERMIT UNIT: N-6208-2-2

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

COW HOUSING - 1,400 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 1,575 MATURE COWS (MILK AND DRY); 1,575 TOTAL SUPPORT STOCK (HEIFERS AND CALVES); AND 7 FREESTALLS WITH FLUSH/SCRAPE SYSTEM

PERMIT UNIT REQUIREMENTS

1. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall pave feedlanes, where present, for a width of at least 8 feet along the corral side of the feedlane fence for milk and dry cows and at least 6 feet along the corral side of the feedlane for heifers. [District Rule 4570]
5. Permittee shall flush, scrape or vacuum freestall lanes immediately prior to, immediately after or during each milking. [District Rule 4570]
6. Permittee shall maintain records sufficient to demonstrate that freestall lanes are flushed, scraped or vacuumed immediately prior to, immediately after or during each milking. [District Rule 4570]
7. Permittee shall remove manure that is not dry from individual cow freestall beds or shall rake, harrow, scrape, or grade freestall bedding at least once every seven (7) days. [District Rule 4570]
8. Permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow freestall beds or 2) the dates when the freestall bedding is raked, harrowed, scraped, or graded. [District Rule 4570]
9. Permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rule 4570]
10. Permittee shall maintain records demonstrating that water pipes and troughs are inspected and leaks are repaired at least once every seven (7) days. [District Rule 4570]
11. Permittee shall clean manure from corrals at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean corrals at least once between April and July and at least once between September and December. [District Rule 4570]
12. Permittee shall demonstrate that manure from corrals are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that corrals are cleaned at least once between April and July and at least once between September and December. [District Rule 4570]

PERMIT UNIT REQUIREMENTS CONTINUE ON NEXT PAGE

These terms and conditions are part of the Facility-wide Permit to Operate.

13. Permittee shall implement at least one of the following corral mitigation measures: 1) slope the surface of the corrals at least 3% where the available space for each animal is 400 square feet or less and shall slope the surface of the corrals at least 1.5% where the available space for each animal is more than 400 square feet per animal; 2) maintain corrals to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape pens sufficiently to maintain a dry surface except during periods of rainy weather. [District Rule 4570]
14. Permittee shall either 1) maintain sufficient records to demonstrate that corrals are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours or 2) maintain records of dates pens are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rule 4570]
15. Permittee shall scrape, vacuum or flush concrete lanes in corrals at least once every day for mature cows and every seven (7) days for support stock. [District Rule 4570]
16. Permittee shall maintain records demonstrating that concrete lanes in corrals are scraped, vacuumed, or flushed at least once every day for mature cows and at least once every seven (7) days for support stock. [District Rule 4570]
17. Shade structures shall be installed in any of the following ways: 1) constructed with a light permeable roofing material; 2) uphill of any slope in the corral; 3) installed so that the structure has a North/South orientation. OR Permittee shall clean manure from under corral shades at least once every fourteen (14) days, when weather permits access into the corral. [District Rule 4570]
18. If Permittee has selected to comply using shades constructed with a light permeable roofing material, then permittee shall maintain records, such as design specifications, demonstrating that the shade structures are equipped with such roofing material or if Permittee has selected to comply by cleaning the manure from under the corral shades, then Permittee shall maintain records demonstrating that manure is cleaned from under the shades at least once every fourteen (14) days, as long as weather permits access to corrals. [District Rule 4570]
19. Permittee shall manage corrals such that the manure depth in the corral does not exceed twelve (12) inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible. [District Rule 4570]
20. Permittee shall measure and document the depth of manure in the corrals at least once every ninety (90) days. [District Rule 4570]
21. Permittee shall maintain a record of the number of animals of each species and production group at the facility and shall maintain quarterly records of any changes to this information. [District Rule 4570]
22. The number of calves may exceed the value stated in the equipment description as long as the total support stock (heifers, bulls, and calves) does not exceed the combined value stated in the equipment description, and there is no increase in the number of hutches or corrals. [District Rule 2010]
23. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rule 4570]
24. This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

These terms and conditions are part of the Facility-wide Permit to Operate.

San Joaquin Valley Air Pollution Control District

PERMIT UNIT: N-6208-3-2

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

LIQUID MANURE HANDLING SYSTEM CONSISTING OF ONE SETTLING BASIN; MECHANICAL SEPARATOR AND ONE STORAGE POND; MANURE IS LAND APPLIED THROUGH FLOOD IRRIGATION

PERMIT UNIT REQUIREMENTS

1. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rule 4570]
5. Permittee shall not allow liquid manure to stand in the fields for more than twenty-four (24) hours after irrigation. [District Rule 4570]
6. Permittee shall maintain records to demonstrate liquid manure did not stand in the fields for more than twenty-four (24) hours after irrigation. [District Rule 4570]
7. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rule 4570]
8. This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

These terms and conditions are part of the Facility-wide Permit to Operate.

San Joaquin Valley Air Pollution Control District

PERMIT UNIT: N-6208-4-2

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; SOLID MANURE APPLICATION TO LAND AND HAULED OFFSITE

PERMIT UNIT REQUIREMENTS

1. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Within seventy two (72) hours of removal of solid manure from housing, permittee shall either 1) remove dry manure from the facility, or 2) cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed twenty-four (24) hours per event. [District Rule 4570]
5. Permittee shall keep records of dates when manure is removed from the facility or permittee shall maintain records to demonstrate that dry manure piles outside the pens are covered with a weatherproof covering from October through May. [District Rule 4570]
6. If weatherproof coverings are used, permittee shall maintain records, such as manufacturer warranties or other documentation, demonstrating that the weatherproof covering over dry manure are installed, used, and maintained in accordance with manufacturer recommendations and applicable standards listed in NRCS Field Office Technical Guide Code 313 or 367, or any other applicable standard approved by the APCO, ARB, and EPA. [District Rule 4570]
7. Permittee shall incorporate all solid manure within seventy-two (72) hours of land application. [District Rule 4570]
8. Permittee shall maintain records to demonstrate that all solid manure has been incorporated within seventy-two (72) hours of land application. [District Rule 4570]
9. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rule 4570]
10. This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

These terms and conditions are part of the Facility-wide Permit to Operate.

San Joaquin Valley Air Pollution Control District

PERMIT UNIT: N-6208-7-1

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

FEED STORAGE AND HANDLING CONSISTING OF COMMODITY BARNs AND SILAGE PILES

PERMIT UNIT REQUIREMENTS

1. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rule 4570]
5. Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rule 4570]
6. Permittee shall push feed so that it is within three feet of feedlane fence within two hours of putting out the feed or use a feed trough or other feeding structure designed to maintain feed within reach of the animals. [District Rule 4570]
7. Permittee shall maintain an operating plan or record that requires feed to be pushed within three feet of feedlane fence within two hours of putting out the feed, or use of a feed trough or other structure designed to maintain feed within reach of the animals. [District Rule 4570]
8. Permittee shall begin feeding total mixed rations within two hours of grinding and mixing rations. [District Rule 4570]
9. Permittee shall maintain an operating plan or record of when feeding of total mixed rations began within two hours of grinding and mixing rations. [District Rule 4570]
10. Permittee shall store grain in a weatherproof storage structure or under a weatherproof covering from October through May. [District Rule 4570]
11. Permittee shall maintain records demonstrating grain is/was stored in a weatherproof storage structure or under a weatherproof covering from October through May. [District Rule 4570]
12. Permittee shall feed steam-flaked, dry rolled, cracked or ground corn or other steam-flaked, dry rolled, cracked or ground cereal grains. [District Rule 4570]
13. Permittee shall maintain records to demonstrate animals are fed steam-flaked, dry rolled, cracked or ground corn or other steam-flaked, dry rolled, cracked or ground cereal grains. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rule 4570]

PERMIT UNIT REQUIREMENTS CONTINUE ON NEXT PAGE

These terms and conditions are part of the Facility-wide Permit to Operate.

14. For bagged silage/feedstuff, permittee shall utilize a sealed feed storage system (e.g., ag bag). [District Rule 4570]
15. Permittee shall cover all silage piles, except for the area where feed is being removed from the pile, with a plastic tarp that is at least five (5) mils (0.005 inches) thick, multiple plastic tarps with a cumulative thickness of at least 5 mils (0.005 inches), or an oxygen barrier film covered with a UV resistant material. Silage piles shall be covered within seventy-two (72) hours of last delivery of material to the pile. Sheets of material used to cover silage shall overlap so that silage is not exposed where the sheets meet. [District Rule 4570]
16. Permittee shall maintain records of the thickness and type of cover used to cover each silage pile. Permittee shall also maintain records of the date of the last delivery of material to each silage pile and the date each pile is covered. [District Rule 4570]
17. Permittee shall select and implement one of the following mitigation measures for building each silage pile at the facility: Option 1) build the silage pile such that the average bulk density is at least 44 lb/cu ft for corn silage and 40 lb/cu ft for other silage types, as measured in accordance with Section 7.11 of District Rule 4570; Option 2) Adjust filling parameters when creating the silage pile to achieve an average bulk density of at least 44 lb/cu ft for corn silage and at least 40 lb/cu ft for other silage types as determined using a District-approved spreadsheet; or Option 3) build silage piles using crops harvested with the applicable minimum moisture content, maximum Theoretical Length of Chop (TLC), and roller opening identified in District Rule 4570, Table 4.1, 1.d and manage silage material delivery such that the thickness of the layer of un-compacted material delivered on top of the pile is no more than six (6) inches. Records of the option chosen as a mitigation measure for building each silage pile shall be maintained. [District Rule 4570]
18. For each silage pile that Option 1 (Measured Bulk Density) is chosen as a mitigation measure for building the pile, records of the measured bulk density shall be maintained. [District Rule 4570]
19. For each silage pile that Option 2 (Bulk Density Determined by Spreadsheet) is chosen as a mitigation measure for building the pile, records of the filling parameters entered into the District-approved spreadsheet to determine the bulk density shall be maintained. [District Rule 4570]
20. For each silage pile that Option 3 (Moisture, TLC, Roller Opening, & Material Delivery) is chosen as a mitigation measure for building the pile, the permittee shall harvest corn used for the pile at an average moisture content of at least 65% and harvest other silage crops for the pile at an average moisture content of at least 60%. [District Rule 4570]
21. For each silage pile that Option 3 (Moisture, TLC, Roller Opening, & Material Delivery) is chosen as a mitigation measure for building the pile, records of the average percent moisture of crops harvested for silage shall be maintained. [District Rule 4570]
22. For each silage pile that Option 3 (Moisture, TLC, Roller Opening, & Material Delivery) is chosen as a mitigation measure for building the pile, the permittee shall adjust setting of equipment used to harvest crops for the pile to incorporate the following parameters for Theoretical Length of Chop (TLC) and roller opening, as applicable: 1) Corn with no processing: TLC not exceeding 1/2 inch, 2) Processed Corn: TLC not exceeding 3/4 inch and roller opening of 1-4 mm, 3) Alfalfa/Grass: TLC not exceeding 1.0 inch, 4) Other silage crops: TLC not exceeding 1/2 inch. [District Rule 4570]
23. For each silage pile that Option 3 (Moisture, TLC, Roller Opening, & Material Delivery) is chosen as a mitigation measure for building the pile, records that equipment used to harvest crops for the pile was set to the required TLC and roller opening for the type of crop harvested shall be maintained. [District Rule 4570]
24. For each silage pile that Option 3 (Moisture, TLC, Roller Opening, & Material Delivery) is chosen as a mitigation measure for building the pile, the permittee shall manage silage material delivery such that the thickness of the layer of un-compacted material delivered on top of the pile is no more than six (6) inches. [District Rule 4570]
25. For each silage pile that Option 3 (Moisture, TLC, Roller Opening, & Material Delivery) is chosen as a mitigation measure for building the pile, the permittee shall maintain a plan that requires that the thickness of the layer of un-compacted material delivered on top of the pile is no more than six (6) inches. [District Rule 4570]

PERMIT UNIT REQUIREMENTS CONTINUE ON NEXT PAGE

These terms and conditions are part of the Facility-wide Permit to Operate.

26. Permittee shall select and implement at least two of the following mitigation measures for management of silage piles at the facility: Option 1) manage silage piles such that only one silage pile has an uncovered face and the total exposed surface area is less than 2,150 square feet, or manage multiple uncovered silage piles such that the total exposed surface area of all uncovered silage piles is less than 4,300 square feet; Option 2) use a shaver/facer to remove silage from the silage pile, or shall use another method to maintain a smooth vertical surface on the working face of the silage pile; or Option 3) inoculate silage with homolactic lactic acid bacteria in accordance with manufacturer recommendations to achieve a concentration of at least 100,000 colony forming units per gram of wet forage, apply propionic acid, benzoic acid, sorbic acid, sodium benzoate, or potassium sorbate at the rate specified by the manufacturer to reduce yeast counts when forming silage piles, or apply other additives at rates that have been demonstrated to reduce alcohol concentrations in silage and/or VOC emissions from silage and have been approved by the District and EPA. Records of the options chosen for managing each silage pile shall be maintained. [District Rule 4570]
27. If Option 1 (Limiting Exposed Area of Silage) is chosen as a mitigation measure for managing silage piles, the permittee shall calculate and record the maximum (largest part of pile) total exposed area of each silage pile. Records of the maximum calculated area shall be maintained. [District Rule 4570]
28. For each silage pile that Option 2 (Shaver/Facer or Smooth Face) is chosen as a mitigation measure for managing the pile, the permittee shall maintain records that a shaver/facer was used to remove silage from the pile or shall visually inspect the pile at least daily to verify that the working face was smooth and maintain records of the visual inspections. [District Rule 4570]
29. For each silage pile that Option 3 (Silage Additives) is chosen as a mitigation measure for managing the pile, records shall be maintained of the type additive (e.g. inoculants, preservative, other District & EPA-approved additive), the quantity of the additive applied to the pile, and a copy of the manufacturers instructions for application of the additive. [District Rule 4570]
30. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rule 4570]
31. This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

These terms and conditions are part of the Facility-wide Permit to Operate.

APPENDIX B

**Draft Authorities To Construct
(N-6208-1-3, -2-3, -3-3, -4-3, & -7-2)**

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: N-6208-1-3

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: TRINKLER DAIRY
MAILING ADDRESS: PO BOX 10
CERES, CA 95307-0010

LOCATION: 7251 CROWS LANDING RD
CERES, CA 95307

EQUIPMENT DESCRIPTION:

MODIFICATION OF 1,400 COW MILKING OPERATION WITH ONE DOUBLE 21 HERRINGBONE (42 STALL) MILK PARLOR: INCREASE NUMBER OF MILK COWS TO 3,180, ADD ONE NEW 72 STALL ROTARY MILKING PARLOR, AND REPURPOSE THE DOUBLE 21 HERRINGBONE (42 STALL) MILKING PARLOR INTO A HOSPITAL MILKING PARLOR

CONDITIONS

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]
4. {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services

N-6208-1-3 : Jul 13 2017 3:29PM - GARCIAAC : Joint Inspection NOT Required

5. Permittee shall flush or hose milk parlor immediately prior to, immediately after, or during each milking. [District Rules 2201 and 4570]
6. Permittee shall provide verification that milk parlor is flushed or hosed down immediately prior to, immediately after, or during each milking. [District Rules 2201 and 4570]
7. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT

PERMIT NO: N-6208-2-3

LEGAL OWNER OR OPERATOR: TRINKLER DAIRY
MAILING ADDRESS: PO BOX 10
CERES, CA 95307-0010

LOCATION: 7251 CROWS LANDING RD
CERES, CA 95307

EQUIPMENT DESCRIPTION:

MODIFICATION OF COW HOUSING - 1,400 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 1,575 MATURE COWS (MILK AND DRY); 1,575 TOTAL SUPPORT STOCK (HEIFERS AND CALVES); AND 7 FREESTALLS WITH FLUSH/SCRAPE SYSTEM: INCREASE MAXIMUM NUMBERS OF COWS TO 3,180 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 3,780 MATURE COWS (MILK AND DRY), AND DECREASE SUPPORT STOCK TO 1,395 CONSISTING OF 275 LARGE HEIFERS (15-24 MONTHS), 520 SMALL HEIFERS (4-6 MONTHS), AND 600 CALVES (0-3 MONTHS); CONSTRUCT ONE NEW FREESTALL BARN (FREESTALL #8), FULLY CONVERT BARN #6 AND #7 INTO FREESTALL BARN, AND CONSTRUCT NEW CALF HOUSING IN ABOVEGROUND HUTCHES AND SAUDI STYLE BARN

CONDITIONS

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

CONDITIONS CONTINUE ON NEXT PAGE

YOU **MUST** NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services

N-6208-2-3 : Jul 27 2017 3:23PM - GARCIA - Joint Inspection NOT Required

4. {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
5. The maximum numbers of heifers shall not exceed either of the following limits: 275 large heifers (15 - 24 months) and 520 small heifers (4 - 6 months). [District Rule 2201]
6. The number of calves may exceed 600 as long as the total number of support stock (heifers and calves) does not exceed 1,395, and there is no increase in the number of hutches or corrals. [District Rule 2201]
7. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4102]
8. Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4102]
9. Permittee shall pave feedlanes for a width of at least 8 feet along the housing side of the feedlane fence for mature cows and at least 6 feet along the housing side of the feedlane fence for heifers. [District Rules 2201, 4102, and 4570]
10. Permittee shall flush, scrape or vacuum freestall lanes immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
11. Permittee shall maintain records sufficient to demonstrate that freestall lanes are flushed, scraped or vacuumed immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
12. For Freestall Barns #6 through #8, permittee shall flush lanes at least four times per day. [District Rules 2201, 4102, and 4570]
13. For Freestall Barns #6 through #8, permittee shall maintain records sufficient to demonstrate that lanes are flushed at least four times per day. [District Rules 2201, 4102, and 4570]
14. Permittee shall remove manure that is not dry from individual cow freestall beds or shall rake, harrow, scrape, or grade freestall bedding at least once every seven (7) days. [District Rules 2201, 4102, and 4570]
15. Permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow freestall beds or 2) the dates when the freestall bedding is raked, harrowed, scraped, or graded. [District Rules 2201, 4102, and 4570]
16. Permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rules 2201 and 4570]
17. Permittee shall maintain records demonstrating that water pipes and troughs are inspected and leaks are repaired at least once every seven (7) days. [District Rules 2201 and 4570]
18. Permittee shall clean manure from corrals at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean corrals at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
19. Permittee shall demonstrate that manure from corrals are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that corrals are cleaned at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
20. Permittee shall implement at least one of the following mitigation measures: 1) slope the surfaces of exercise pens/corrals at least 3% where the available space for each animal is 400 square feet or less and at least 1.5% where the available space for each animal is more than 400 square feet per animal; 2) maintain exercise pens/corrals to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape exercise pens/corrals sufficiently to maintain a dry surface except during periods of rainy weather. [District Rule 2201, 4102, and 4570]

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CONDITIONS CONTINUE ON NEXT PAGE

21. Permittee shall either 1) maintain sufficient records to demonstrate that exercise pens/corrals are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours; or 2) maintain records of dates when exercise pens/corrals are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rule 2201, 4102, and 4570]
22. For Freestall Barns #6 through #8, permittee shall scrape exercise pen surfaces every two weeks using a pull-type scraper during morning hours, except when prevented by wet conditions. [District Rules 2201 and 4102]
23. For Freestall Barns #6 through #8, permittee shall maintain sufficient records to demonstrate that exercise pen surfaces are scraped every two weeks using a pull-type scraper during morning hours, except when prevented by wet conditions. [District Rules 2201 and 4102]
24. Permittee shall scrape, vacuum or flush concrete lanes in corrals at least once every day for mature cows and every seven (7) days for support stock. [District Rules 2201 and 4570]
25. Permittee shall maintain records demonstrating that concrete lanes in corrals are scraped, vacuumed, or flushed at least once every day for mature cows and at least once every seven (7) days for support stock. [District Rules 2201 and 4570]
26. Permittee shall manage corrals such that the manure depth in the corral does not exceed twelve (12) inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible. [District Rules 2201, 4102, and 4570]
27. Permittee shall measure and document the depth of manure in the corrals at least once every ninety (90) days. [District Rules 2201, 4102, and 4570]
28. Permittee shall maintain a record of the number of animals of each species and production group at the facility and shall maintain quarterly records of any changes to this information. [District Rules 2201 and 4570]
29. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201, 4102, and 4570]

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San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT

PERMIT NO: N-6208-3-3

LEGAL OWNER OR OPERATOR: TRINKLER DAIRY
MAILING ADDRESS: PO BOX 10
CERES, CA 95307-0010

LOCATION: 7251 CROWS LANDING RD
CERES, CA 95307

EQUIPMENT DESCRIPTION:

MODIFICATION OF LIQUID MANURE HANDLING SYSTEM CONSISTING OF ONE SETTLING BASIN; MECHANICAL SEPARATOR(S) AND TWO STORAGE PONDS; MANURE IS LAND APPLIED THROUGH FLOOD IRRIGATION; ALLOW INCREASE IN THROUGHPUT DUE TO HERD EXPANSION AND CONSTRUCT AN ANAEROBIC TREATMENT LAGOON (500' X 375' X 15')

CONDITIONS

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]
4. {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services
N-6208-3-3: Jul 27 2017 3:28PM - GARCIA: Joint Inspection NOT Required

5. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4102]
6. Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4102]
7. All liquid manure shall be treated in an anaerobic treatment lagoon system that is designed and operated according to the Natural Resources Conservation Service (NRCS) Field Office Technical Guide No. 359. The minimum liquid manure depth shall be 13 feet and shall be retained in the lagoon at all times. [District Rules 2201 and 4102]
8. Permittee shall maintain design specifications and calculations, including minimum treatment volume (MTV) and hydraulic retention time (HRT) calculations, demonstrating that the anaerobic treatment lagoon system meets the requirements listed in the NRCS Field Office Technical Guide No. 359. [District Rules 2201 and 4102]
9. Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rules 2201, 4102, and 4570]
10. Any liquid manure applied to land shall have been treated in an anaerobic treatment lagoon system that is designed and operated according to the NRCS Field Office Technical Guide No. 359. [District Rule 2201]
11. Permittee shall maintain records to demonstrate that liquid manure applied to land has been treated in an anaerobic treatment lagoon system that is designed and operated according to the NRCS Field Office Technical Guide No. 359. [District Rule 2201]
12. Permittee shall not allow liquid manure to stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]
13. Permittee shall maintain records to demonstrate liquid manure did not stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]
14. The concentration of undissociated hydrogen sulfide (undissociated H₂S concentration) in the surface layer of the anaerobic lagoon shall not exceed 5.0 mg/L during any calendar quarter. The undissociated H₂S concentration shall be determined using the measured values for the total sulfide concentration, pH, and temperature. The fraction of total sulfide that is undissociated H₂S shall be calculated using one of the following methods: 1) the formula $(10^{-\text{pH}})/(10^{-\text{pH}} + K_{a1})$, where K_{a1} is the temperature-adjusted dissociation constant for H₂S; 2) the procedures outlined in Standard Method 4500-S₂-H; or 3) other procedures approved by the District. [District Rules 2201 and 4102]
15. The permittee shall measure and record the total sulfide concentration, pH, and temperature of the surface layer of the anaerobic lagoon, and shall determine the undissociated H₂S concentration, at least once every calendar quarter, with at least 30 days between quarterly measurements, and at other times as may be requested by the District. If measurement samples cannot be safely obtained directly from the surface layer of the lagoon, then samples obtained by alternative methods, such as pump or flush valve discharge, may be used. [District Rules 2201 and 4102]
16. If the undissociated H₂S concentration exceeds the permit limit, then the permittee shall measure and record the total sulfide concentrations, pH, and temperatures, and shall determine the undissociated H₂S concentrations, from at least two other areas of the lagoon's surface layer, as soon as possible, but not longer than 24 hours after results from the initial measurements indicated a potential exceedance. The undissociated H₂S concentration determined from the initial measurements and the undissociated H₂S concentrations determined from the secondary measurements shall be averaged. If the resulting average undissociated H₂S concentration exceeds the permit limit, then the permittee shall measure and record the total sulfide concentration, pH, and temperature of the surface layer of the lagoon, and shall determine the undissociated H₂S concentration, at least once every month. Once compliance with the undissociated H₂S concentration permit limit has been demonstrated for three consecutive months, the monitoring frequency may return to once every calendar quarter. [District Rules 2201 and 4102]
17. If the lagoon's liquid depth does not exceed 5 feet throughout the monitoring period (quarter or month), then the undissociated H₂S concentration shall be considered negligible, in which case measurements of the total sulfide concentration, pH, and temperature shall not be required, provided records of the lagoon's liquid depth are maintained. The District may also approve alternative monitoring frequencies and/or parameters. [District Rules 2201 and 4102]

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CONDITIONS CONTINUE ON NEXT PAGE

18. Measurement of the total sulfide concentration shall be performed using any of the following methods: 1) a sulfide test kit; 2) a sulfide meter; 3) procedures of an accredited lab; 4) Standard Method 4500-S2; 5) ASTM D4658; 6) USGS Method I-3840; 7) EPA Method 376.2; 8) Marine Pollution Studies Laboratory (MPSL) Standard Operating Procedure for measurement of sulfide; or 9) other methods approved by the District. [District Rules 2201 and 4102]
19. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201, 4102, and 4570]

DRAFT

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: N-6208-4-3

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: TRINKLER DAIRY
MAILING ADDRESS: PO BOX 10
CERES, CA 95307-0010

LOCATION: 7251 CROWS LANDING RD
CERES, CA 95307

EQUIPMENT DESCRIPTION:

MODIFICATION OF SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; SOLID MANURE APPLICATION TO LAND AND HAULED OFFSITE: ALLOW INCREASE IN THROUGHPUT DUE TO HERD EXPANSION

CONDITIONS

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]
4. {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
5. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rule 2201]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services
N-6208-4-3 : Jul 13 2017 3:29PM - GARCIA : Joint Inspection NOT Required

6. Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rule 2201]
7. Within seventy two (72) hours of removal of solid manure from housing, permittee shall either 1) remove dry manure from the facility, or 2) cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed twenty-four (24) hours per event. [District Rules 2201 and 4570]
8. Permittee shall keep records of dates when manure is removed from the facility or permittee shall maintain records to demonstrate that dry manure piles outside the pens are covered with a weatherproof covering from October through May. [District Rules 2201 and 4570]
9. If weatherproof coverings are used, permittee shall maintain records, such as manufacturer warranties or other documentation, demonstrating that the weatherproof covering over dry manure are installed, used, and maintained in accordance with manufacturer recommendations and applicable standards listed in NRCS Field Office Technical Guide Code 313 or 367, or any other applicable standard approved by the APCO, ARB, and EPA. [District Rules 2201 and 4570]
10. Solid manure shall be incorporated into the soil within two hours of land application. [District Rules 2201 and 4570]
11. Permittee shall maintain records to demonstrate that solid manure has been incorporated into the soil within two hours of land application. [District Rules 2201 and 4570]
12. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]

DRAFT

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: N-6208-7-2

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: TRINKLER DAIRY
MAILING ADDRESS: PO BOX 10
CERES, CA 95307-0010

LOCATION: 7251 CROWS LANDING RD
CERES, CA 95307

EQUIPMENT DESCRIPTION:

MODIFICATION OF FEED STORAGE AND HANDLING CONSISTING OF COMMODITY BARNs AND SILAGE PILES:
ALLOW INCREASE IN TOTAL MIXED RATION FEEDING DUE TO HERD EXPANSION, REMOVE SILAGE PILES AND
ADD AG BAG(S)

CONDITIONS

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]
4. {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director, APCO

Arnaud Marjollet, Director of Permit Services
N-6208-7-2 : Jul 13 2017 3:29PM - GARCIA : Joint Inspection NOT Required

5. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
6. Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
7. Permittee shall push feed so that it is within three feet of feedlane fence within two hours of putting out the feed or use a feed trough or other feeding structure designed to maintain feed within reach of the animals. [District Rules 2201 and 4570]
8. Permittee shall maintain an operating plan/record that requires feed to be pushed within three feet of feedlane fence within two hours of putting out the feed, or use of a feed trough or other structure designed to maintain feed within reach of the animals. [District Rules 2201 and 4570]
9. Permittee shall begin feeding total mixed rations within two hours of grinding and mixing rations. [District Rules 2201 and 4570]
10. Permittee shall maintain an operating plan/record of when feeding of total mixed rations began within two hours of grinding and mixing rations. [District Rules 2201 and 4570]
11. Permittee shall store grain in a weatherproof storage structure or under a weatherproof covering from October through May. [District Rules 2201 and 4570]
12. Permittee shall maintain records demonstrating grain is/was stored in a weatherproof storage structure or under a weatherproof covering from October through May. [District Rules 2201 and 4570]
13. Permittee shall feed steam-flaked, dry rolled, cracked or ground corn or other steam-flaked, dry rolled, cracked or ground cereal grains. [District Rules 2201 and 4570]
14. Permittee shall maintain records to demonstrate animals are fed steam-flaked, dry rolled, cracked or ground corn or other steam-flaked, dry rolled, cracked or ground cereal grains. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
15. Permittee shall utilize only sealed feed storage systems (e.g., ag bag) for silage/feedstuff. [District Rules 2201 and 4570]
16. Only three of the sealed feed storage systems shall have an open face at any time. All other sealed feed storage systems shall remain closed. [District Rule 2201]
17. Permittee shall maintain records of each sealed feed storage system and records of the last delivery and bagging of material to each feed storage system. Documents from contractor(s) containing this information are acceptable. [District Rule 2201]
18. Permittee shall maintain records of the dates in which any sealed storage system with an open face is being used. [District Rule 2201]
19. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]

DRAFT

APPENDIX C

Pre and Post-Project Site Plans

PRE Project

Trinkler Dairy Farms Inc.

Existing Capacity

Legend

300 calves 0-3

Barn 2 - 100 milk cows

Heifer Barns 1-3
150 heifers 4-6

Barn 1 - 175 dry cows

Barn 3 - 250 milk cows

Barn 4 - 250 milk cows

Barn 6 - 550 Milk Cows

Barn 5 - 250 milk cows

Pens 1-3

Pens 4-9

Google earth

700 ft





S

OF - SHEETS

SHEET

CUP SITE PLAN

1" = 350'-0"

DATE: 01/07/16

SCALE:

PROJECT #

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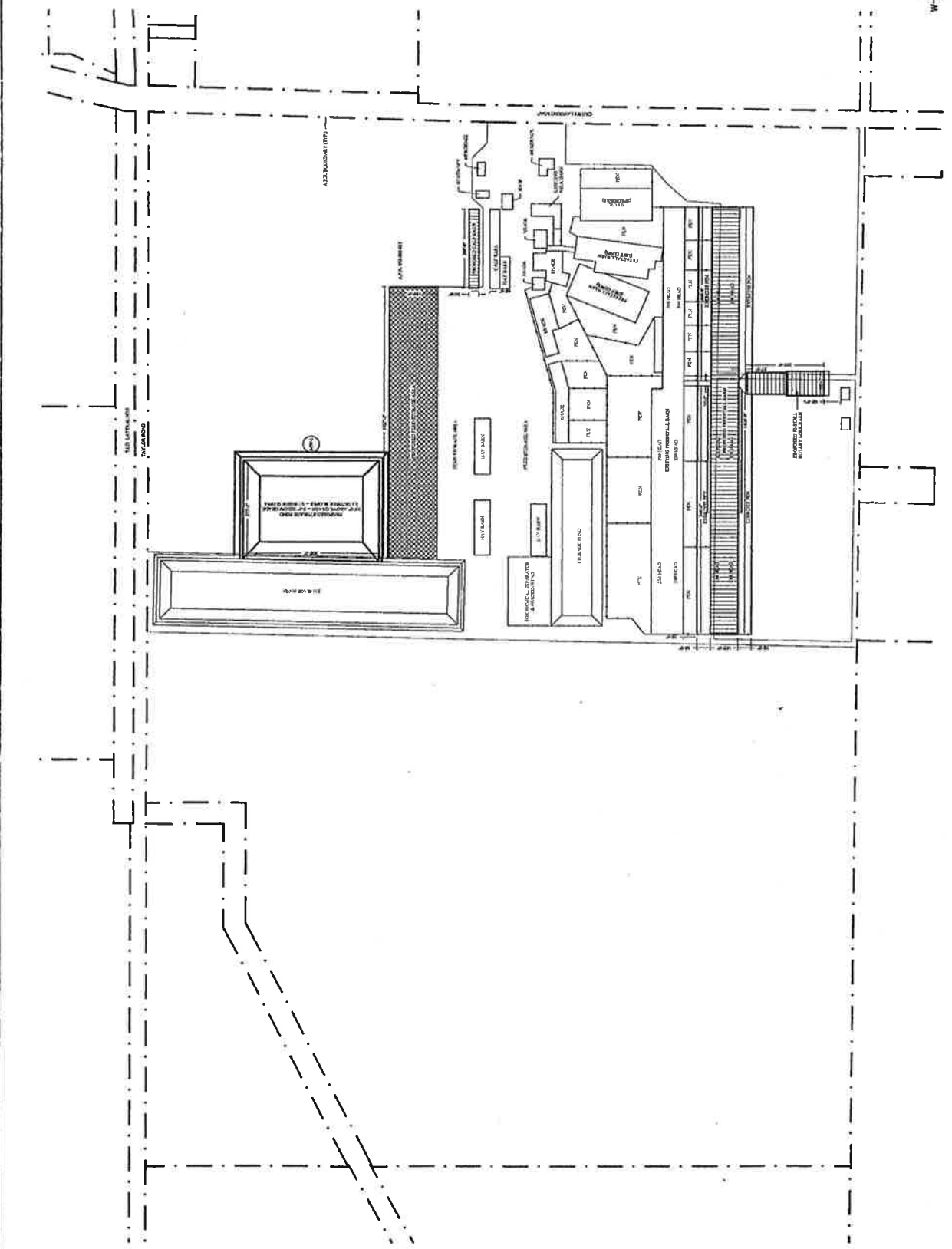
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SITE PLAN

TRINKLER DAIRY
FARMS INC.
7251 CROWS LANDING RD.
CERES, CA 95307

California Office
1818 E. Colton Ave. - Fresno, CA 93703
2030 66th St. - Pomona, CA 91768
101 S. 1st St. - Suite 200 - Oxnard, CA 93030
FAX: 559.433.1111
E-MAIL: info@trinklerdairy.com



APPENDIX D

Anaerobic Treatment Lagoon Design Check Spreadsheets

Lagoon Design Check in Accordance with NRCS Guideline #359

Proposed Lagoon Volume

Volume of treatment lagoon = (L x W x D) – (S x D²) x (W + L) + (4 x S² x D³ ÷ 3)

Primary Treatment Lagoon Dimensions

Length	500	ft
Width	375	ft
Depth	13	ft
Slope	3	ft

(Subtract 2 feet from the actual lagoon depth for run-off or miscellaneous water.)

Primary Lagoon Volume 2,020,239 ft3

INSTRUCTIONS

* only input yellow fields

- Step 1 Enter primary lagoon dimensions on this sheet
- Step 2 Go to "Net Volatile Solids Loading" sheet and enter number of animals flushing manure to lagoon
- Step 3 Adjust % in flush and separation as necessary (see notes on sheet)
- Step 4 Go to "Minimum Treatment Volume"
- Step 5 Minimum treatment volume should be less than lagoon volume to be considered anaerobic treatment lagoon
- Step 6 Go to "Hydraulic Retention Time"
- Step 7 Adjust fresh water as applicable
- Step 8 Hydraulic retention time should be greater than 34 days to be considered anaerobic treatment lagoon.

Lagoon Design Check in Accordance with NRCS Guideline #359

Net Volatile Solids loading Calculation

Net Volatile Solids (VS) Loading of Treatment Lagoons						
Breed: Holstein type or cow	Number of Animals	VS Excreted ^[1] (lb/day)	% Manure in Flush ^[2]	x	(1 - % VS Removed in Separation ^[3])	=
Milk Cows	3,180	17	71%	x	50%	=
Dry Cow	600	9.2	71%	x	50%	=
Heifer (15 to 24 months)	275	7.1	60%	x	50%	=
Heifer (7 to 14 months)		4.9	48%	x	50%	=
Heifer (3 to 6 months)	520	2.7	48%	x	50%	=
Calf (under 3 months)	600	1.0	48%	x	50%	=
Bulls		9.2	48%	x	50%	=
Total for Dairy						22,218

[1] The Volatile Solids (VS) excretion rates for Holstein cattle are based on Table 1.b – Section 3 of ASAE D384.2 (March 2005). VS excretion rates for milk cows, dry cows, & heifers 15-24 months were taken from directly from the table. The VS excretion rate for heifers 3-6 months was estimated based on total solids excretion. The VS excretion rate for heifers 7-14 months was estimated as the average of heifers 15-24 months and heifers 3-6 months. The table did not give values for total solids or volatile solids excreted by baby calves. The VS excretion rate for baby calves was estimated based on an estimated dry matter intake (DMI) of 1.7% of body weight and the ratio of DMI to VS excretion for 150 kg calves. The VS excretion rate for mature bulls was assumed to be similar to dry cows.

[2] The % manure was taken from Table 3-1 of the California Regional Water Quality Control Board Document "Managing Dairy Manure in the Central Valley of California", UC Davis, June 2005. This document estimated that 21-48% of the manure in open corral dairies is handled as a liquid. Therefore, as a worst case assumption, 48% will be used for all cows housed in open corrals with flush lanes. The document also estimates a range of 42-100% manure handled as a liquid in the freestalls. For freestalls without exercise pens, 100% of manure as a liquid in the flush will be used; for freestalls with exercise pens, the average of the range $((100+42)/2 = 71\%)$ will be used. (<http://groundwater.ucdavis.edu/Publications/uc-committee-of-experts-final-report%202006.pdf>) Saudi style/loafing barns are hybrids between freestalls and open corrals, the percentage of manure collected on the concrete feed lanes will be averaged between the values from the cows housed in freestall barns and open corrals. Therefore the % of manure deposited on the concrete lanes is equal to 60% $[(71+48)/2]$.

[3] Chastain, J.P., Vanotti, M. B., and Wingfield, M. M., Effectiveness of Liquid-Solid Separation For Treatment of Flushed Dairy Manure: A Case Study, Applied Engineering in Agriculture, Vol 17(3): 343-354 - This document outlines a VS removal rate of 50.1% to 70% depending on the type of separation system used, however to be conservative, a 50% VS removal will be used for all systems.

Minimum Treatment Volume Calculation

MTV = TVS/VSLR

Where:

MTV = Minimum Treatment Volume (ft³)

TVS = daily Total Volatile solids Loading (lb/day) = 0.011 lb/ft3-day

VSLR = Volatile Solids Loading Rate (lb/1000 ft3-day)

Minimum Treatment Volume in Primary Lagoon				
Breed: Holstein Type of Cow	Net VS Loading (lb/day)		VSLR (lb/ft3- day)[1]	MTV (ft³)
Milk Cows	19,191	÷	0.011	= 1,744,664
Dry Cow	1,960	÷	0.011	= 178,145
Heifer (15 to 24 months)	586	÷	0.011	= 53,250
Heifer (7 to 14 months)	0	÷	0.011	= 0
Heifer (3 to 6 months)	337	÷	0.011	= 30,633
Calf (under 3 months)	144	÷	0.011	= 13,091
Bulls	0	÷	0.011	= 0
Total for Dairy				2,019,783

[1] VSLR for an anaerobic treatment lagoon in San Joaquin Valley would be 6.5 lb VS/1000 ft3-day to 11 lb VS/1000 ft3-day according to the NRCS and USDA AWTFH. Based on phone conversation with Matt Summers (USDA) on July 14, 2006, he suggested that the 11 lb VS VS/1000 ft3-day

Sludge Accumulation Volume

The sludge accumulation volume accounts for the solids contained in the manure that cannot be fully digested by bacteria and that gradually settle to the bottom of the lagoon as sludge. The sludge accumulation volume for lagoon systems without solids separation can be calculated from the USDA Field Handbook. However, there are no accepted guidelines for calculating the sludge accumulation volume for lagoon systems with solids separation, but many designers of digester expect it to be minimal.

This facility has an efficient solids separation system consisting prior to the anaerobic treatment lagoon system. The separation system will remove a large portion of the fibers, lignin, cellulose, and other fibrous materials from the manure. These are the materials that would otherwise cause sludge accumulation from the lack of digestion in a lagoon or digester. Because fibrous materials and other solids will not enter the lagoon system, the sludge accumulation volume required will be minimized and can be considered negligible.

Nevertheless, the primary lagoon will have sufficient space remaining for sludge accumulation, as shown by the following calculation:

SAV = VPL - MTV

Where:

- SAV = Sludge Accumulation Volume (ft³)
- VPL = total Volume of Primary Lagoon (ft³)
- MTV = Minimum Treatment Volume (ft³)

SAV =	VPL	-	MTV	
SAV =	2,020,239	2,019,783 =	456	(ft3)

Lagoon Design Check in Accordance with NRCS Guideline #359

Hydraulic Retention Time (HRT) Calculation

The anaerobic treatment lagoon and covered lagoon anaerobic digester must be designed to provide sufficient Hydraulic Retention Time (HRT) to adequately treat the waste entering the lagoon and to allow environmentally safe utilization of this waste. The NRCS Technical Guide Code 365 – Anaerobic Digester – Ambient Temperature specifies a minimum HRT 38 days in the San Joaquin Valley.

The Hydraulic Retention Time (HRT) is calculated as follows:

$$HRT = MTV/HFR$$

where:

HFR = Hydraulic flow rate (1000ft³/day)

HRT = Hydraulic Retention Time (day)

The Hydraulic Flow Rate is Calculated below

Type	# of cows	Amount of Manure*			HFR
Milk Cows	3,180	x	2.40	ft ³	= 7,632 ft ³ /day
Dry Cows	600	x	1.30	ft ³	= 780 ft ³ /day
Heifers (15-24 mo)	275	x	0.78	ft ³	= 215 ft ³ /day
Heifers (7-14 mo)	0	x	0.78	ft ³	= - ft ³ /day
Heifers (3-6 mo)	520	x	0.30	ft ³	= 156 ft ³ /day
Calves	600	x	0.15	ft ³	= 90 ft ³ /day
Bulls	0	x	1.30	ft ³	= - ft ³ /day
Total	5,175				8,873 ft³/day
Fresh water per milk cow used in flush at milk parlor			50	gal/day	

*Table 1.b - Section 3 of ASAE D384.2 (March 2005). The calf manure was estimated to be 1/2 of the calf number found in the table, since the average weight of these calves is approx. 1/2 of the calves identified in the table.

Lagoon Design Check in Accordance with NRCS Guideline #359 Cont.

Formula:

Gallon	#	x	ft3	+	ft3
Milk Cow*Day	Milk Cows		gallon		day

Total HFR:

50 gal	3180 milk cows	x	ft3	+	8,873	ft3
milk-cow*-day			7.48 gal			day



	=	30,129.2	ft3/day
--	---	----------	---------

Formula:

MTV (ft3)	/	(day)	=
		HFR (ft3)	

HRT:

2,019,783 ft3	day	=	67.0374178	days
	30,129.2 ft3			



APPENDIX E

Dairy Emissions Calculation Spreadsheets

Pre-Project Facility Information

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

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	1,400				1,400		
Dry Cows			175		175		
Support Stock (Heifers, Calves, and Bulls)			1,575		1,575		
Large Heifers					0		
Medium Heifers					0		
Small Heifers					0		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves							0

Total Herd Summary	
Total Milk Cows	1,400
Total Mature Cows	1,575
Support Stock (Heifers, Calves, and Bulls)	1,575
Total Calves	0
Total Dairy Head	3,150

Pre-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn	1	30	95
Alfalfa	1	30	50
Wheat	1	30	95

Post-Project Facility Information

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

Post-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	3,180				3,180		
Dry Cows	600				600		
Support Stock (Heifers, Calves, and Bulls)					0		
Large Heifers	275				275		
Medium Heifers					0		
Small Heifers				520	520		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves	600						600

Total Herd Summary	
Total Milk Cows	3,180
Total Mature Cows	3,780
Support Stock (Heifers, Calves, and Bulls)	795
Total Calves	600
Total Dairy Head	5,175

Post-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn	1	12	8
Alfalfa	1	12	8
Wheat	1	12	8

VOC Mitigation Measures and Control Efficiencies

Milking Parlor				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
		Enteric Emissions Mitigations		
☒	☒	(D) Feed according to NRC guidelines	10%	10%
		Total Control Efficiency	10%	10%
		Milking Parlor Floor Mitigations		
☒	☒	(D) Feed according to NRC guidelines	10%	10%
☒	☒	(D) Flush or hose milk parlor immediately prior to, immediately after, or during each milking. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF.	0%	0%
		Total Control Efficiency	10%	10%

Cow Housing				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
		Enteric Emissions Mitigations		
☒	☒	Feed according to NRC guidelines	10%	10%
		Total Control Efficiency	10%	10%
		Corrals/Pens Mitigations		
☒	☒	Feed according to NRC guidelines	10%	10%
☒	☒	Inspect water pipes and troughs and repair leaks at least once every seven days. Note: If selected for dairies > 999 milk cows, CE is already included in EF.	0%	0%
☒	☒	Dairies: Clean manure from corrals at least four times per year with at least 60 days between cleaning, or clean corrals at least once between April and July and at least once between September and December. Note: If selected for dairies > 999 milk cows, CE is already included in EF. Note: No additional control given for increased cleaning frequency (e.g. BACT requirement). Heifer/Calf Ranches: Scrape corrals twice a year with at least 90 days between cleanings, excluding in-corral mounds. Note: No additional control given for increased cleaning frequency (e.g. BACT requirement).	0%	0%
☒	☒	Scrape, vacuum, or flush concrete lanes in corrals at least once every day for mature cows and every seven days for support stock, or clean concrete lanes such that the depth of manure does not exceed 12 inches at any point or time. Note: No additional control given for increased cleaning frequency (e.g. BACT requirement).	10%	10%
☒	☒	Implement one of the following: 1) slope the surface of the corrals at least 3% where the available space for each animal is 400 sq ft or less and slope the surface of the corrals at least 1.5% where the available space for each animal is more than 400 sq ft; 2) maintain corrals to ensure proper drainage preventing water from standing more than 48 hrs; 3) harrow, rake, or scrape pens sufficiently to maintain a dry surface. Note: If selected for dairies > 999 milk cows, CE already included in EF.	0%	0%
☐	☐	Install shade structures such that they are constructed with a light permeable roofing material. Note: If selected for dairies > 999 milk cows, the control efficiency will be 5% since the EF used includes a partial control for this measure.	5%	5%
☒	☒	Install all shade structures uphill of any slope in the corral. Note: If selected for dairies > 999 milk cows, the control efficiency will be 5% since the EF used includes a partial control for this measure.		
☐	☐	Clean manure from under corral shades at least once every 14 days, when weather permits access into corral. Note: If selected for dairies > 999 milk cows, the control efficiency will be 5% since the EF used includes a partial control for this measure.		
☐	☐	Install shade structure so that the structure has a North/South orientation. Note: If selected for dairies > 999 milk cows, the control efficiency will be 5% since the EF used includes a partial control for this measure.	0%	0%
☒	☒	Manage corrals such that the manure depth in the corral does not exceed 12 inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. The manure facility must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF.		
☐	☐	Knockdown fence line manure build-up prior to it exceeding a height of 12 inches at any time or point. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. The facility must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible.		
☐	☐	Use lime or a similar absorbent material in the corral according to the manufacturer's recommendation to minimize moisture in the corrals.	0%	0%
☐	☐	Apply thymol to the corral soil in accordance with the manufacturer's recommendation.	0%	0%
		Total Control Efficiency	23.05%	23.05%
		Bedding Mitigations		
☒	☒	Feed according to NRC guidelines	10%	10%

☐	☐	Use non-manure-based bedding and non-separated solids based bedding for at least 90% of the bedding material, by weight, for freestalls (e.g. rubber mats, almond shells, sand, or waterbeds).	0%	0%
☒	☒	For a large dairy (1,000 milk cows or larger) or a heifer/calf ranch - Remove manure that is not dry from individual cow freestall beds or rake, harrow, scrape, or grade freestall bedding at least once every 7 days.	10%	10%
☐	☐	(D) For a medium dairy only (500 to 999 milk cows) - Remove manure that is not dry from individual cow freestall beds or rake, harrow, scrape, or grade freestall bedding at least once every 14 days.	0%	0%
			19.00%	19.00%
Lanes Mitigations				
☒	☒	Feed according to NRC guidelines	10%	10%
☒	☒	Pave feedlanes, where present, for a width of at least 8 feet along the corral side of the feedlane fence for milk and dry cows and at least 6 feet along the corral side of the feedlane for heifers. Note: No control efficiency at this time.	0%	0%
☒	☒	Dairies: Flush, scrape, or vacuum freestall flush lanes immediately prior to or after, or during each milking; or flush or scrape freestall flush lanes at least 3 times per day. Heifer/Calf Ranches: Vacuum, scrape, or flush freestalls at least once every seven days.	10%	10%
☐	☐	(D) Have no animals in exercise pens or corrals at any time.	0%	0%
Total Control Efficiency			19.00%	19.00%

Liquid Manure Handling				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
		Lagoons/Storage Ponds Mitigations		
☒	☒	Feed according to NRC guidelines	10%	10%
☐	☐	Use phototropic lagoon	0%	0%
☐	☒	Use an anaerobic treatment lagoon designed according to NRCS Guideline No. 359	0%	40%
☒	☒	Remove solids from the waste system with a solid separator system, prior to the waste entering the lagoon. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF.	0%	0%
☐	☐	Maintain lagoon pH between 6.5 and 7.5	0%	0%
Total Control Efficiency			10.00%	46.00%
		Liquid Manure Land Application Mitigations		
☒	☒	Feed according to NRC guidelines	10%	10%
☐	☒	Only apply liquid manure that has been treated with an anaerobic or aerobic treatment lagoon, aerobic lagoon, or digester system	0%	40%
☒	☒	Allow liquid manure to stand in the fields for no more than 24 hours after irrigation. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF.	0%	0%
☐	☐	Apply liquid/slurry manure via injection with drag hose or similar apparatus	0%	0%
Total Control Efficiency			10.00%	46.00%

Solid Manure Handling				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
Solid Manure Storage Mitigations				
☒	☒	Feed according to NRC guidelines	10%	10%
☒	☒	LARGE CAFO ONLY: Within 72 hours of removal from housing, either a) remove dry manure from the facility, or b) cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed 24 hours per event.	10%	10%
Total Control Efficiency			19.00%	19.00%
Separated Solids Piles Mitigations				
☒	☒	Feed according to NRC guidelines	10%	10%
☐	☐	LARGE CAFO ONLY: Within 72 hours of removal from the drying process, either a) remove separated solids from the facility, or b) cover separated solids outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed 24 hours per event.	0%	0%
Total Control Efficiency			10.00%	10.00%
Solid Manure Land Application Mitigations				
☒	☒	Feed according to NRC guidelines	10%	10%
☒	☒	Incorporate all solid manure within 72 hours of land application. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF. Note: No additional control given for rapid manure incorporation (e.g. BACT requirement).	0%	0%
☐	☐	Only apply solid manure that has been treated with an anaerobic treatment lagoon, aerobic lagoon or digester system.	0%	0%
☐	☐	Apply no solid manure with a moisture content of more than 50%	0%	0%
Total Control Efficiency			10.00%	10.00%

Silage and TMR				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
		Corn/Alfalfa/Wheat Silage Mitigations		
		1. Utilize a sealed feed storage system (e.g. Ag-Bag) for bagged silage, or		

☒	☒	2. Cover the surface of silage piles, except for the area where feed is being removed from the pile, with a plastic tarp that is at least 5 mils thick (0.005 inches), multiple plastic tarps with a cumulative thickness of at least 5 mils (0.005 inches), or an oxygen barrier film covered with a UV resistant material within 72 hours of last delivery of material to the pile, and implement one of the following: a) build silage piles such that the average bulk density is at least 44 lb/cu-ft for corn silage and 40 lb/cu-ft for other silage types, as measured in accordance with Section 7.10 of Rule 4570, b) when creating a silage pile, adjust filling parameters to assure a calculated average bulk density of at least 44 lb/cu-ft for corn silage and at least 40 lb/cu-ft for other silage types, using a spreadsheet approved by the District, c) harvest silage crop at > or = 65% moisture for corn; and >= 60% moisture for alfalfa/grass and other silage crops; manage silage material delivery such that no more than 6 inches of materials are uncompacted on top of the pile; and incorporate the applicable Theoretical Length of Chop (TLC) and roller opening for the crop being harvested. For dairies - implement <u>two</u> of the following: For heifer/calf ranches - implement <u>one</u> of the following: <u>Manage Exposed Silage.</u> a) manage silage piles such that only one silage pile has an uncovered face and the uncovered face has a total exposed surface area of less than 2,150 sq. ft., or b) manage multiple uncovered silage piles such that the total exposed surface area of all silage piles is less than 4,300 sq. ft. <u>Maintain Silage Working Face.</u> a) use a shaver/facer to remove silage from the silage pile, or b) maintain a smooth vertical surface on the working face of the silage pile <u>Silage Additive:</u> a) inoculate silage with homolactic acid bacteria in accordance with manufacturer recommendations to achieve a concentration of at least 100,000 colony forming units per gram of wet forage or apply propionic acid, benzoic acid, sorbic acid, sodium benzoate, or potassium sorbate at a rate specified by the manufacturer to reduce yeast counts when forming silage pile; or b) apply other additives at specified rates that have been demonstrated to reduce alcohol concentrations in silage and/or VOC emissions from silage and have been approved by the District and EPA.	39.0%	39.0%
Total Control Efficiency*			39.00%	39.00%

*Assumes 25% control for density mitigation measures and 10% each for the two optional measures, resulting in an overall control of 39%. The same conservative control efficiency will be applied to the sealed feed storage system (Ag-Bag).

		TMR Mitigations		
☒	☒	(D) Push feed so that it is within 3 feet of feedlane fence within 2 hrs of putting out the feed or use a feed trough or other feeding structure designed to maintain feed within reach of the cows.	10%	10%
☒	☒	(D) Begin feeding total mixed rations within 2 hrs of grinding and mixing rations. Note: If selected for dairies > 999 milk cows, control efficiency already included in EF.	0%	0%
☒	☒	Feed steam-flaked, dry rolled, cracked or ground corn or other ground cereal grains.	10%	10%
☐	☐	Remove uneaten wet feed from feed bunks within 24 hrs after the end of a rain event.	0%	0%
☐	☐	(D) For total mixed rations that contain at least 30% by weight of silage, feed animals total mixed rations that contain at least 45% moisture.	0%	0%
☒	☒	Feed according to NRC guidelines. Note: If selected for dairies, control efficiency already included in EF.	0%	0%
Total Control Efficiency			19.00%	19.00%

Ammonia Mitigation Measures and Control Efficiencies

Milking Parlor				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	NH3 Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
		Milking Parlor Floor Mitigations		
☒	☒	Feed according to NRC guidelines	28%	28%
Total Control Efficiency			28%	28%

Cow Housing				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	NH3 Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
		Corrals/Pens Mitigations		
☒	☒	Feed according to NRC guidelines	28%	28%
☒	☒	Clean manure from corrals at least four times per year with at least 60 days between cleaning, or clean corrals at least once between April and July and at least once between September and December. OR Use lime or a similar absorbent material in the corral according to the manufacturer's recommendation to minimize moisture in the corrals. OR Apply thymol to the corral soil in accordance with the manufacturer's recommendation.	50%	50%
Total Control Efficiency			64%	64%
		Bedding Mitigations		
☒	☒	Feed according to NRC guidelines	28%	28%
☒	☒	Use non-manure-based bedding and non-separated solids based bedding for at least 90% of the bedding material, by weight, for freestalls (e.g. rubber mats, almond shells, sand, or waterbeds). OR For a large dairy only (1,000 milk cows or larger) - Remove manure that is not dry from individual cow freestall beds or rake, harrow, scrape, or grade freestall bedding at least once every 7 days. OR For a medium dairy only (500 to 999 milk cows) - Remove manure that is not dry from individual cow freestall beds or rake, harrow, scrape, or grade freestall bedding at least once every 14 days.	47.7%	47.7%
Total Control Efficiency			62.34%	62.34%
		Lanes Mitigations		
☒	☒	Feed according to NRC guidelines	28%	28%
Total Control Efficiency			28%	28%

Liquid Manure Handling				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	NH3 Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
		Lagoons/Storage Ponds Mitigations		
☒	☒	Feed according to NRC guidelines	28%	28%
☒	☒	Use phototropic lagoon OR Remove solids from the waste system with a solid separator system, prior to the waste entering the lagoon.	80%	80%
Total Control Efficiency			85.6%	85.6%
		Liquid Manure Land Application Mitigations		
☒	☒	Feed according to NRC guidelines	28%	28%
☐	☒	Only apply liquid manure that has been treated with an anaerobic treatment lagoon	0%	42%
Total Control Efficiency			28.00%	58.24%

Solid Manure Handling				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	NH3 Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
		Solid Manure Land Application Mitigations		
☒	☒	Feed according to NRC guidelines	28%	28%
☐	☐	Incorporate all solid manure within 72 hours of land application. AND Only apply solid manure that has been treated with an anaerobic treatment lagoon, aerobic lagoon or digester system. AND Apply no solid manure with a moisture content of more than 50%	0%	0%
Total Control Efficiency			28.00%	28.00%

		lb/dry-yr Dairy Emissions Factors for Holstein Cows												Small Heifers (3 to 8 months)				Calves (9 - 12 months)				Sows			
		Large Heifers (15 to 24 months)				Medium Heifers (7 to 14 months)				Dry Cows				Milk Cows				Uncontrolled				Controlled			
		EF1	EF2	EF1	EF2	EF1	EF2	EF1	EF2	EF1	EF2	EF1	EF2	EF1	EF2	EF1	EF2	EF1	EF2	EF1	EF2	EF1	EF2	EF1	EF2
VOC	Milking Parlor	0.43	0.41	0.37	0.37	0.44	0.44	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
		0.04	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
NH3	Total	0.47	0.44	0.40	0.40	0.47	0.47	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
		0.19	0.19	0.14	0.14	0.19	0.19	0.14	0.14	0.19	0.19	0.14	0.14	0.19	0.19	0.14	0.14	0.19	0.19	0.14	0.14	0.19	0.19	0.14	0.14
VOC	Cow Housing	3.89	3.89	3.32	3.32	3.89	3.89	3.32	3.32	3.89	3.89	3.32	3.32	3.89	3.89	3.32	3.32	3.89	3.89	3.32	3.32	3.89	3.89	3.32	3.32
		10.00	6.60	5.08	5.08	10.00	6.60	5.08	5.08	10.00	6.60	5.08	5.08	10.00	6.60	5.08	5.08	10.00	6.60	5.08	5.08	10.00	6.60	5.08	5.08
NH3	Total	1.05	1.00	0.81	0.57	1.05	1.00	0.81	0.57	1.05	1.00	0.81	0.57	1.05	1.00	0.81	0.57	1.05	1.00	0.81	0.57	1.05	1.00	0.81	0.57
		0.84	0.80	0.65	0.65	0.84	0.80	0.65	0.65	0.84	0.80	0.65	0.65	0.84	0.80	0.65	0.65	0.84	0.80	0.65	0.65	0.84	0.80	0.65	0.65
VOC	Liquid Manure Handling	16.78	12.09	9.88	9.88	16.78	12.09	9.88	9.88	16.78	12.09	9.88	9.88	16.78	12.09	9.88	9.88	16.78	12.09	9.88	9.88	16.78	12.09	9.88	9.88
		1.52	1.30	1.17	0.70	1.52	1.30	1.17	0.70	1.52	1.30	1.17	0.70	1.52	1.30	1.17	0.70	1.52	1.30	1.17	0.70	1.52	1.30	1.17	0.70
NH3	Total	3.16	2.70	2.43	1.48	3.16	2.70	2.43	1.48	3.16	2.70	2.43	1.48	3.16	2.70	2.43	1.48	3.16	2.70	2.43	1.48	3.16	2.70	2.43	1.48
		0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37
VOC	Solid Manure Handling	17.00	17.19	7.89	4.90	17.00	17.19	7.89	4.90	17.00	17.19	7.89	4.90	17.00	17.19	7.89	4.90	17.00	17.19	7.89	4.90	17.00	17.19	7.89	4.90
		0.15	0.15	0.12	0.09	0.15	0.15	0.12	0.09	0.15	0.15	0.12	0.09	0.15	0.15	0.12	0.09	0.15	0.15	0.12	0.09	0.15	0.15	0.12	0.09
NH3	Total	0.06	0.06	0.05	0.03	0.06	0.06	0.05	0.03	0.06	0.06	0.05	0.03	0.06	0.06	0.05	0.03	0.06	0.06	0.05	0.03	0.06	0.06	0.05	0.03
		0.39	0.33	0.30	0.21	0.39	0.33	0.30	0.21	0.39	0.33	0.30	0.21	0.39	0.33	0.30	0.21	0.39	0.33	0.30	0.21	0.39	0.33	0.30	0.21
VOC	Feed Storage and Handling	3.61	0.64	0.47	0.47	3.61	0.64	0.47	0.47	3.61	0.64	0.47	0.47	3.61	0.64	0.47	0.47	3.61	0.64	0.47	0.47	3.61	0.64	0.47	0.47
		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
NH3	Total	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
		2.09	2.09	1.50	1.50	2.09	2.09	1.50	1.50	2.09	2.09	1.50	1.50	2.09	2.09	1.50	1.50	2.09	2.09	1.50	1.50	2.09	2.09	1.50	1.50
VOC	Total	3.42	3.42	2.83	2.83	3.42	3.42	2.83	2.83	3.42	3.42	2.83	2.83	3.42	3.42	2.83	2.83	3.42	3.42	2.83	2.83	3.42	3.42	2.83	2.83
		0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37	0.90	0.80	0.64	0.37

		Silage and TMR (Total Mixed Ration) Emissions (µg/m ³ ·2-min)			
		Uncontrolled	EF1	EF2	
VOC	Feed Storage and Handling	34,081	21,155	21,155	
		17,458	10,649	10,649	
		43,844	26,745	26,745	
		13,056	10,575	10,575	

Assumptions: 1) Each silage pile is completely covered except for the front face and 2) Ratios are fed within 48 hours.

		PM ₁₀ Emission Factors (lb/dry-yr)		Source	
Type of Cow	Dairy EF				
		Uncontrolled	Controlled	Uncontrolled	Controlled
Cows in Freestalls	1.37			Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy	
	2.73			SVAPCD	
	5.26			SVAPCD	
	5.48			SVAPCD	
Cows in Loose Housing	1.37			Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy	
	2.73			SVAPCD	
	5.26			SVAPCD	
	5.48			SVAPCD	
Cows in Open Corrals	1.37			Based on a USDA/ARS Dairy report quantifying dairy and feedlot emissions in Tulare & Kern Counties (April 01)	
	2.73			SVAPCD	
	5.26			SVAPCD	
	5.48			SVAPCD	
Calf on-ground Corrals	1.37			Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy	
	2.73			SVAPCD	
	5.26			SVAPCD	
	5.48			SVAPCD	
Calf in Stocking Corrals	1.37			Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy	
	2.73			SVAPCD	
	5.26			SVAPCD	
	5.48			SVAPCD	

The controlled PM₁₀EF will be calculated based on the specific PM₁₀ mitigation measures, if any, for each freestall, corral, or calf hutch area. See the PM Mitigation Measures for calculations.

Pre-Project PM10 Control Efficiencies and Emission Factors

Housing Names(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	Fibrous layer	Bl-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)
1	1	freestall	dry cows	175	175	1,370													1.37
2	2	freestall	milk cows	100	100	1,370													1.37
3	3	freestall	milk cows	250	250	1,370													1.37
4	4	freestall	milk cows	250	250	1,370													1.37
5	5	freestall	milk cows	250	250	1,370													1.37
6	6F	freestall	milk cows	137	137	1,370													1.37
7	6L	loafing barn	milk cows	137	137	2,730													2.73
8	7F	freestall	milk cows	138	138	1,370													1.37
9	7L	loafing barn	milk cows	138	138	2,730													2.73
10	Heifer Barn 1	saudi style barn	support stock	70	70	1,370													1.37
11	Heifer Barn 2	saudi style barn	support stock	70	70	1,370													1.37
12	Heifer Barn 3	saudi style barn	support stock	70	70	1,370													1.37
13	Calf Barn	saudi style barn	support stock	300	300	1,370													1.37
14	Corral 1	open corral	support stock	200	200	10,550													10.55
15	Corral 2	open corral	support stock	200	200	10,550													10.55
16	Corral 3	open corral	support stock	200	200	10,550													10.55
17	Corral 4	open corral	support stock	65	65	10,550													10.55
18	Corral 5	open corral	support stock	65	65	10,550													10.55
19	Corral 6	open corral	support stock	65	65	10,550													10.55
20	Corral 7	open corral	support stock	90	90	10,550													10.55
21	Corral 8	open corral	support stock	90	90	10,550													10.55
22	Corral 9	open corral	support stock	90	90	10,550													10.55
							Pre-Project Total # of Cows		3,150										

Post-Project PM10 Mitigation Measures

[illegible]

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	1	dry cows	175	5.57	10.71	1.37	2.7	975	5.1	1,874	0.7	240	
2	2	milk cows	100	9.86	21.13	1.37	2.7	986	5.8	2,113	0.4	137	
3	3	milk cows	250	9.86	21.13	1.37	6.8	2,465	14.5	5,282	0.9	343	
4	4	milk cows	250	9.86	21.13	1.37	6.8	2,465	14.5	5,282	0.9	343	
5	5	milk cows	250	9.86	21.13	1.37	6.8	2,465	14.5	5,282	0.9	343	
6	6F	milk cows	137	9.86	21.13	1.37	3.7	1,351	7.9	2,895	0.5	188	
7	6L	milk cows	137	9.86	21.13	2.73	3.7	1,351	7.9	2,895	1.0	374	
8	7F	milk cows	138	9.86	21.13	1.37	3.7	1,361	8.0	2,916	0.5	189	
9	7L	milk cows	138	9.86	21.13	2.73	3.7	1,361	8.0	2,916	1.0	377	
10	Heifer Barn 1	support stock	70	4.27	5.54	1.37	0.8	299	1.1	388	0.3	96	
11	Heifer Barn 2	support stock	70	4.27	5.54	1.37	0.8	299	1.1	388	0.3	96	
12	Heifer Barn 3	support stock	70	4.27	5.54	1.37	0.8	299	1.1	388	0.3	96	
13	Calf Barn	support stock	300	4.27	5.54	1.37	3.5	1,281	4.6	1,661	1.1	411	
14	Corral 1	support stock	200	4.27	5.54	10.55	2.3	854	3.0	1,107	5.8	2,110	
15	Corral 2	support stock	200	4.27	5.54	10.55	2.3	854	3.0	1,107	5.8	2,110	
16	Corral 3	support stock	200	4.27	5.54	10.55	2.3	854	3.0	1,107	5.8	2,110	
17	Corral 4	support stock	65	4.27	5.54	10.55	0.8	278	1.0	360	1.9	686	
18	Corral 5	support stock	65	4.27	5.54	10.55	0.8	278	1.0	360	1.9	686	
19	Corral 6	support stock	65	4.27	5.54	10.55	0.8	278	1.0	360	1.9	686	
20	Corral 7	support stock	90	4.27	5.54	10.55	1.1	384	1.4	498	2.6	950	
21	Corral 8	support stock	90	4.27	5.54	10.55	1.1	384	1.4	498	2.6	950	
22	Corral 9	support stock	90	4.27	5.54	10.55	1.1	384	1.4	498	2.6	950	
	Pre-Project Total # of Cows			3,150				59.1	21,506	110.3	40,175	39.7	14,471

Pre-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
3,150	59.1	21,506	110.3	40,175	39.7	14,471

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	1	large heifers	175	4.27	5.54	1.37	2.0	747	2.7	969	0.7	240
2	2	large heifers	100	4.27	5.54	1.37	1.2	427	1.5	554	0.4	137
3	3	dry cows	300	5.57	10.71	1.37	4.6	1,671	8.8	3,213	1.1	411
4	4	dry cows	300	5.57	10.71	1.37	4.6	1,671	8.8	3,213	1.1	411
5	5	small heifers	370	1.62	3.00	1.37	1.6	599	3.0	1,111	1.4	507
6	6F	milk cows	400	9.86	21.13	1.17	10.8	3,944	23.2	8,451	1.3	466
7	6L	milk cows	400	9.86	21.13	1.17	10.8	3,944	23.2	8,451	1.3	466
8	7F	milk cows	400	9.86	21.13	1.17	10.8	3,944	23.2	8,451	1.3	466
9	7L	milk cows	400	9.86	21.13	1.17	10.8	3,944	23.2	8,451	1.3	466
10	Heifer Barn 1	small heifers	50	1.62	3.00	1.37	0.2	81	0.4	150	0.2	69
11	Heifer Barn 2	small heifers	50	1.62	3.00	1.37	0.2	81	0.4	150	0.2	69
12	Heifer Barn 3	small heifers	50	1.62	3.00	1.37	0.2	81	0.4	150	0.2	69
13	Calf Barn	calves	300	0.78	0.90	1.37	0.6	234	0.7	271	1.1	411
Post-Project # of Cows (non-expansion)			3,295				58.4	21,368	119.5	43,585	11.6	4,188

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	Barn 8	milk cows	1580	9.86	21.13	1.17	42.7	15,579	91.5	33,383	5.0	1,841
2	Calf Barn 2	calves	300	0.78	0.90	1.37	0.6	234	0.7	271	1.1	411
Total # of Cows From Expansion			1,880				43.3	15,813	92.2	33,654	6.1	2,252

Post-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
5,175	101.7	37,181	211.7	77,239	17.7	6,440

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)

Pre-Project Potential to Emit (PE1)

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	1,400	0	0	0	1,400		
Dry Cows	0	0	175	0	175		
Support Stock (Heifers, Calves and Bulls)	0	0	1,575	0	1,575		
Large Heifers	0	0	0	0	0		
Medium Heifers	0	0	0	0	0		
Small Heifers	0	0	0	0	0		
Bulls	0	0	0	0	0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves	0	0	0	0	0	0	0

Silage Information				
Feed Type	Maximum # Open Piles	Maximum Height (ft)	Maximum Width (ft)	Open Face Area (ft ²)
Corn	1	30	95	2,294
Alfalfa	1	30	50	1,290
Wheat	1	30	95	2,294

Milking Parlor				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	1.5	560	0.5	192

Cow Housing						
Cow	VOC		NH3		PM10	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Total	59.1	21,506	110.3	40,175	39.7	14,471

Liquid Manure Handling						
Cow	VOC		NH3		H2S	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	9.3	3,402	29.1	10,626	0.5	165
Dry Cows	0.6	233	1.8	672	0	11
Support Stock (Heifers, Calves and Bulls)	4.4	1,607	8.5	3,103	0.1	50
Large Heifers	0.0	0	0.0	0	0	0
Medium Heifers	0.0	0	0.0	0	0	0
Small Heifers	0.0	0	0.0	0	0	9
Calves	0.0	0	0.0	0	0	0
Bulls	0.0	0	0.0	0	0	0
Total	14.3	5,241	39.4	14,401	0.6	235

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	1.8	658	10.9	3,962
Dry Cows	0.1	46	0.7	250
Support Stock (Heifers, Calves and Bulls)	0.9	315	3.2	1,181
Large Heifers	0.0	0	0.0	0
Medium Heifers	0.0	0	0.0	0
Small Heifers	0.0	0	0.0	0
Calves	0.0	0	0.0	0
Bulls	0.0	0	0.0	0
Total	2.8	1,019	14.8	5,394

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	14.3	5,214
Alfalfa Emissions	2.0	738
Wheat Emissions	18.1	6,592
TMR	69.4	25,346
Total	103.8	37,890

Total Daily Pre-Project Potential to Emit (lb/day)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	1.5	0.5	0.0
Cow Housing	0.0	0.0	39.7	0.0	59.1	110.3	0.0
Liquid Manure	0.0	0.0	0.0	0.0	14.3	39.4	0.6
Solid Manure	0.0	0.0	0.0	0.0	2.8	14.8	0.0
Feed Handling	0.0	0.0	0.0	0.0	103.8	0.0	0.0
Total	0.0	0.0	39.7	0.0	181.5	165.0	0.6

Total Annual Pre-Project Potential to Emit (lb/yr)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	560	192	0
Cow Housing	0	0	14,471	0	21,506	40,175	0
Liquid Manure	0	0	0	0	5,241	14,401	235
Solid Manure	0	0	0	0	1,019	5,394	0
Feed Handling	0	0	0	0	37,890	0	0
Total	0	0	14,471	0	66,216	60,161	235

Calculations for milking parlor:

Annual PE = (# milk cows) x (EF1 lb-pollutant/hd-yr)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculations for cow housing:

See detailed calculations under Cow Housing Calculations worksheet.

Calculations for liquid manure and solid manure handling:

Annual PE = [(# milk cows) x (EF1 lb-pollutant/hd-yr)] + [(# dry cows) x (EF1 lb-pollutant/hd-yr)] + [(# large heifers) x (EF1 lb-pollutant/hd-yr)] + [(# medium heifers) x (EF1 lb-pollutant/hd-yr)] + [(# small heifers) x (EF1 lb-pollutant/hd-yr)] + [(# calves) x (EF1 lb-pollutant/hd-yr)] + [(# bulls) x (EF1 lb-pollutant/hd-yr)]

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculations for H2S for lagoon/storage pond(s):

The H2S emission factor is assumed to be 10% of the NH3 lagoon/storage pond(s) emission factor, for each respective herd size. To be conservative, all support stock will use the large heifer EF1.

Annual PE_{H2S} = [(# milk cows) x (EF1 lb-NH3/hd-yr)] + [(# dry cows) x (EF1 lb-NH3/hd-yr)] + [(# support stock) x (EF1_{large heifer} lb-NH3/hd-yr)] x 0.10
Daily PE_{H2S} = (Annual PE lb/yr) ÷ (365 day/yr)

Calculations for silage emissions:

Annual PE = (EF1) x (area ft²) x (0.0929 m²/ft²) x (8,760 hr/yr) x (60 min/hr) x 2.20E-9 lb/μg

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculation for TMR emissions:

Annual PE = (# cows) x (EF1) x (0.658 m²) x (525,600 min/yr) x (2.20E-9 lb/μg)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calves are not included in TMR calculation.

Major Source Emissions (lb/yr)					
Permit	NOx	SOx	PM10	CO	VOC
Milk Parlor	0	0	0	0	0
Cow Housing	0	0	0	0	0
Liquid Manure	0	0	0	0	2,522
Solid Manure	0	0	0	0	0
Feed Handling	0	0	0	0	0
Total	0	0	0	0	2,522

Post-Project Potential to Emit (PE2)

Post-Project Herd Size					
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals
Milk Cows	3,180	0	0	0	3,180
Dry Cows	600	0	0	0	600
Support Stock (Heifers, Calves, and Bulls)	0	0	0	0	0
Large Heifers	275	0	0	0	275
Medium Heifers	0	0	0	0	0
Small Heifers	0	0	0	520	520
Bulls	0	0	0	0	0
Calf Hutches					
	Calf Hutches		Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	
Calves	600	0	0	0	600

Silage Information				
Feed Type	Maximum # Open Piles	Maximum Height (ft)	Maximum Width (ft)	Open Face Area (ft ²)
Corn	1	12	8	87
Alfalfa	1	12	8	87
Wheat	1	12	8	87

Milking Parlor				
	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	lb/day	lb/yr	lb/day	lb/yr
Total	3.5	1,272	1.2	435

Cow Housing						
	VOC		NH3		PM10	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Total	101.7	37,181	211.7	77,239	17.7	6,440

Liquid Manure Handling						
Cow	VOC		NH3		H2S	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	12.7	4,643	42.7	15,582	1	375
Dry Cows	1.3	474	4.1	1,488	0.1	36
Support Stock (Heifers, Calves, and Bulls)	0.0	0	0.0	0	0	0
Large Heifers	0.5	168	1.0	352	0	9
Medium Heifers	0.0	0	0.0	0	0	0
Small Heifers	0.3	120	1.0	374	0	9
Calves	0.2	66	0.3	120	0	3
Bulls	0.0	0	0.0	0	0	0
Total	15.0	5,470	49.1	17,916	1.1	433

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	4.1	1,495	24.7	8,999
Dry Cows	0.4	156	2.4	858
Support Stock (Heifers, Calves, and Bulls)	0.0	0	0.0	0
Large Heifers	0.2	55	0.6	206
Medium Heifers	0.0	0	0.0	0
Small Heifers	0.1	36	0.6	208
Calves	0.1	24	0.2	72
Bulls	0.0	0	0.0	0
Total	4.9	1,766	28.5	10,344

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	0.5	198
Alfalfa Emissions	0.1	50
Wheat Emissions	0.7	251
TMR	100.9	36,812
Total	102.2	37,311

Total Daily Post-Project Potential to Emit (lb/day)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	3.5	1.2	0.0
Cow Housing	0.0	0.0	17.7	0.0	101.7	211.7	0.0
Liquid Manure	0.0	0.0	0.0	0.0	15.0	49.1	1.1
Solid Manure	0.0	0.0	0.0	0.0	4.9	28.5	0.0
Feed Handling	0.0	0.0	0.0	0.0	102.2	0.0	0.0
Total	0.0	0.0	17.7	0.0	227.3	290.5	1.1

Total Annual Post-Project Potential to Emit (lb/yr)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	1,272	435	0
Cow Housing	0	0	6,440	0	37,181	77,239	0
Liquid Manure	0	0	0	0	5,470	17,916	433
Solid Manure	0	0	0	0	1,766	10,344	0
Feed Handling	0	0	0	0	37,311	0	0
Total	0	0	6,440	0	83,000	105,934	433

Calculations for milking parlor:

Annual PE = (# milk cows) x (EF2 lb-pollutant/hd-yr)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculations for cow housing:

See detailed calculations under Cow Housing Calculations worksheet.

Calculations for liquid manure and solid manure handling:

Annual PE = [(# milk cows) x (EF2 lb-pollutant/hd-yr)] + [(# dry cows) x (EF2 lb-pollutant/hd-yr)] + [(# large heifers) x (EF2 lb-pollutant/hd-yr)] + [(# medium heifers) x (EF2 lb-pollutant/hd-yr)] + [(# small heifers) x (EF2 lb-pollutant/hd-yr)] + [(# calves) x (EF2 lb-pollutant/hd-yr)] + [(# bulls) x (EF2 lb-pollutant/hd-yr)]

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculations for H2S for lagoon/storage pond(s)

The H2S emission factor is assumed to be 10% of the NH3 lagoon/storage pond(s) emission factor, for each respective herd size.

Annual PE_{H2S} = [(# milk cows) x (EF2 lb-NH3/hd-yr)] + [(# dry cows) x (EF2 lb-NH3/hd-yr)] + [(# large heifers) x (EF2 lb-NH3/hd-yr)] + [(# small heifers) x (EF2 lb-NH3/hd-yr)] + [(# calves) x (EF2 lb-NH3/hd-yr)] x 0.10

Daily PE_{H2S} = (Annual PE lb/yr) ÷ (365 day/yr)

Calculations for silage emissions:

Annual PE = (EF2) x (area ft²) x (0.0929 m²/ft²) x (8,760 hr/yr) x (60 min/hr) x 2.20E-9 lb/μg

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculation for TMR emissions:

Annual PE = (# cows) x (EF2) x (0.658 m²) x (525,600 min/yr) x (2.20E-9 lb/μg)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Major Source Emissions (lb/yr)					
Permit	NOx	SOx	PM10	CO	VOC
Milking Parlor	0	0	0	0	0
Cow Housing	0	0	0	0	0
Liquid Manure	0	0	0	0	2,623
Solid Manure	0	0	0	0	0
Feed Handling	0	0	0	0	0
Total	0	0	0	0	2,623

PE1

PE1 Calculations for H₂S for lagoon/storage pond(s):

The H₂S emission factor is assumed to be 10% of the NH₃ lagoon/storage pond(s) emission factor, for each respective herd size.

$$\text{Annual PE}_{\text{H}_2\text{S}} = [(\# \text{ milk cows}) \times (\text{EF1 lb-NH}_3/\text{hd-yr})] + [(\# \text{ dry cows}) \times (\text{EF1 lb-NH}_3/\text{hd-yr})] + [(\# \text{ support stock}) \times (\text{EF1}_{\text{large heifer}} \text{ lb-NH}_3/\text{hd-yr})] \times 0.10$$

$$\text{Daily PE}_{\text{H}_2\text{S}} = (\text{Annual PE lb/yr}) \div (365 \text{ day/yr})$$

$$\begin{aligned} \text{Annual PE}_{\text{H}_2\text{S}} &= [(1400) \times (1.18)] + [(175) \times (0.60)] + [(1575) \times (0.32)] \times 0.10 \\ &= 226.1 \quad \text{lb/year} \end{aligned}$$

$$\begin{aligned} \text{Daily PE}_{\text{H}_2\text{S}} &= (\text{Annual PE lb/yr}) \div (365 \text{ day/yr}) \\ &= 0.6 \quad \text{lb/day} \end{aligned}$$

PE2

PE2 Calculations for H₂S for lagoon/storage pond(s):

The H₂S emission factor is assumed to be 10% of the NH₃ lagoon/storage pond(s) emission factor, for each respective herd size.

$$\begin{aligned} \text{Annual PE}_{\text{H}_2\text{S}} &= [(\# \text{ milk cows}) \times (\text{EF2 lb-NH}_3/\text{hd-yr})] + [(\# \text{ dry cows}) \times (\text{EF2 lb-NH}_3/\text{hd-yr})] + \\ &\quad [(\# \text{ large heifers}) \times (\text{EF2 lb-NH}_3/\text{hd-yr})] + \\ &\quad [(\# \text{ small heifers}) \times (\text{EF2 lb-NH}_3/\text{hd-yr})] + \\ &\quad [(\# \text{ calves}) \times (\text{EF2 lb-NH}_3/\text{hd-yr})] \times 0.10 \end{aligned}$$

$$\text{Daily PE}_{\text{H}_2\text{S}} = (\text{Annual PE lb/yr}) \div (365 \text{ day/yr})$$

$$\begin{aligned} \text{Annual PE}_{\text{H}_2\text{S}} &= [(3180) \times (1.18)] + [(600) \times (0.60)] + [(275) \times (0.32)] + [(520) \times (0.17)] + \\ &\quad [(600) \times (0.05)] \times 0.10 \\ &= 431.88 \quad \text{lb/year} \end{aligned}$$

$$\begin{aligned} \text{Daily PE}_{\text{H}_2\text{S}} &= (\text{Annual PE lb/yr}) \div (365 \text{ day/yr}) \\ &= 1.2 \quad \text{lb/day} \end{aligned}$$

BACT Applicability

Milking Parlor					
VOC Emissions					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	3.5	1.5	0.40	0.40	2.0
Total					2.0
NH3 Emissions					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	1.2	0.5	0.14	0.14	0.7
Total					0.7

Cow Housing					
See detailed cow housing AIPE calculations on following pages.					

Liquid Manure Handling					
VOC Emissions - Lagoon/Storage Pond(s)					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	6.1	4.5	0.70	1.17	3.4
Dry Cows	0.6	0.3	0.38	0.64	0.4
Support Stock (Heifers, Calves, and Bulls)	0.0	2.1	0.29	0.49	-1.2
Large Heifers	0.2	0.0	0.29	0.49	0.2
Medium Heifers	0.0	0.0	0.20	0.33	0.0
Small Heifers	0.2	0.0	0.11	0.19	0.2
Calves	0.1	0.0	0.05	0.09	0.1
Bulls	0.0	0.0	0.18	0.30	0.0
BACT triggered for VOC for Lagoon/Storage Ponds					Total 3.1
VOC Emissions - Land Application					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	6.6	4.8	0.76	1.26	3.7
Dry Cows	0.7	0.3	0.41	0.69	0.5
Support Stock (Heifers, Calves, and Bulls)	0.0	2.3	0.32	0.53	-1.4
Large Heifers	0.2	0.0	0.32	0.53	0.2
Medium Heifers	0.0	0.0	0.22	0.36	0.0
Small Heifers	0.2	0.0	0.12	0.20	0.2
Calves	0.1	0.0	0.06	0.10	0.1
Bulls	0.0	0.0	0.19	0.32	0.0
BACT triggered for VOC for Liquid Manure Land Application					Total 3.4
NH3 Emissions - Lagoon/Storage Pond(s)					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	10.3	4.5	1.18	1.18	5.8
Dry Cows	1.0	0.3	0.60	0.60	0.7
Support Stock (Heifers, Calves, and Bulls)	0.0	1.4	0.32	0.32	-1.4
Large Heifers	0.2	0.0	0.32	0.32	0.2
Medium Heifers	0.0	0.0	0.22	0.22	0.0
Small Heifers	0.2	0.0	0.17	0.17	0.2
Calves	0.1	0.0	0.05	0.05	0.1
Bulls	0.0	0.0	0.43	0.43	0.0
BACT triggered for NH3 for Lagoon/Storage Ponds					Total 5.6
NH3 Emissions - Land Application					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	32.4	24.6	3.72	6.41	18.1
Dry Cows	3.1	1.6	1.88	3.24	2.2
Support Stock (Heifers, Calves, and Bulls)	0.0	7.1	0.96	1.66	-4.1
Large Heifers	0.7	0.0	0.96	1.66	0.7
Medium Heifers	0.0	0.0	0.71	1.22	0.0
Small Heifers	0.8	0.0	0.54	0.94	0.8
Calves	0.3	0.0	0.15	0.27	0.3
Bulls	0.0	0.0	1.35	2.33	0.0
BACT triggered for NH3 for Liquid Manure Land Application					Total 18.0
H2S Emissions - Lagoon/Storage Pond(s)					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	1.0	0.5	0.12	0.12	0.5
Dry Cows	0.1	0.0	0.06	0.06	0.1
Support Stock (Heifers, Calves, and Bulls)	0.0	0.1	0.03	0.03	-0.1
Large Heifers	0.0	0.0	0.03	0.03	0.0
Medium Heifers	0.0	0.0	0.02	0.02	0.0
Small Heifers	0.0	0.0	0.02	0.02	0.0
Calves	0.0	0.0	0.01	0.01	0.0
Bulls	0.0	0.0	0.04	0.04	0.0
Total					0.5

Solid Manure Handling					
VOC Emissions - Solid Manure Storage/Separated Solids Piles					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	1.5	0.7	0.18	0.18	0.8
Dry Cows	0.2	0.0	0.10	0.10	0.2
Support Stock (Heifers, Calves, and Bulls)	0.0	0.3	0.10	0.07	-0.3
Large Heifers	0.1	0.0	0.07	0.07	0.1
Medium Heifers	0.0	0.0	0.05	0.05	0.0
Small Heifers	0.0	0.0	0.03	0.03	0.0
Calves	0.0	0.0	0.01	0.01	0.0
Bulls	0.0	0.0	0.05	0.05	0.0
Total					0.8
VOC Emissions - Land Application					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	2.6	1.1	0.30	0.30	1.5
Dry Cows	0.3	0.1	0.16	0.16	0.2
Support Stock (Heifers, Calves, and Bulls)	0.0	0.5	0.12	0.12	-0.5
Large Heifers	0.1	0.0	0.12	0.12	0.1
Medium Heifers	0.0	0.0	0.08	0.08	0.0
Small Heifers	0.1	0.0	0.05	0.05	0.1
Calves	0.0	0.0	0.02	0.02	0.0
Bulls	0.0	0.0	0.07	0.07	0.0
Total					1.4
NH3 Emissions - Solid Manure Storage/Separated Solids Piles					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	11.6	5.1	1.33	1.33	6.5
Dry Cows	1.1	0.3	0.67	0.67	0.8
Support Stock (Heifers, Calves, and Bulls)	0.0	1.5	0.35	0.35	-1.5
Large Heifers	0.3	0.0	0.35	0.35	0.3
Medium Heifers	0.0	0.0	0.25	0.25	0.0
Small Heifers	0.3	0.0	0.18	0.18	0.3
Calves	0.1	0.0	0.06	0.06	0.1
Bulls	0.0	0.0	0.49	0.49	0.0
BACT triggered for NH3 for Solid Manure Storage					Total 6.5
NH3 Emissions - Land Application					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	13.1	5.8	1.50	1.50	7.3
Dry Cows	1.3	0.4	0.76	0.76	0.9
Support Stock (Heifers, Calves, and Bulls)	0.0	1.7	0.40	0.40	-1.7
Large Heifers	0.3	0.0	0.40	0.40	0.3
Medium Heifers	0.0	0.0	0.28	0.28	0.0
Small Heifers	0.3	0.0	0.22	0.22	0.3
Calves	0.1	0.0	0.06	0.06	0.1
Bulls	0.0	0.0	0.55	0.55	0.0
BACT triggered for NH3 for Solid Manure Land Application					Total 7.2

Feed Storage and Handling					
VOC Emissions - Silage					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Corn Silage	0.5	14.3	21,155	21,155	-13.8
Alfalfa Silage	0.1	2.0	10,649	10,649	-1.9
Wheat Silage	0.7	18.1	26,745	26,745	-17.4
Total					-33.1
VOC Emissions - TMR					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
TMR	100.9	69.4	10,575	10,575	31.5
BACT triggered for VOC for TMR					Total 31.5

Cow Housing - VOC Emissions							
	Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)	BACT Triggered?
1	1	2.0	2.7	4.27	5.57	-0.1	No
2	2	1.2	2.7	4.27	9.86	0.0	No
3	3	4.6	6.8	5.57	9.86	0.8	No
4	4	4.6	6.8	5.57	9.86	0.8	No
5	5	1.6	6.8	1.62	9.86	0.5	No
6	6F	10.8	3.7	9.86	9.86	7.1	Yes
7	6L	10.8	3.7	9.86	9.86	7.1	Yes
8	7F	10.8	3.7	9.86	9.86	7.1	Yes
9	7L	10.8	3.7	9.86	9.86	7.1	Yes
10	Heifer Barn 1	0.3	0.8	1.62	4.27	0.0	No
11	Heifer Barn 2	0.3	0.8	1.62	4.27	0.0	No
12	Heifer Barn 3	0.3	0.8	1.62	4.27	0.0	No
13	Calf Barn	0.6	3.5	0.78	4.27	0.0	No
14	Corral 1 (removed)	0.0	2.3	0.00	4.27	0.0	No
15	Corral 2 (removed)	0.0	2.3	0.00	4.27	0.0	No
16	Corral 3 (removed)	0.0	2.3	0.00	4.27	0.0	No
17	Corral 4 (removed)	0.0	0.8	0.00	4.27	0.0	No
18	Corral 5 (removed)	0.0	0.8	0.00	4.27	0.0	No
19	Corral 6 (removed)	0.0	0.8	0.00	4.27	0.0	No
20	Corral 7 (removed)	0.0	1.1	0.00	4.27	0.0	No
21	Corral 8 (removed)	0.0	1.1	0.00	4.27	0.0	No
22	Corral 9 (removed)	0.0	1.1	0.00	4.27	0.0	No
New Units from Expansion							
	Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	PE2 (lb/day)	BACT Triggered?
1	Barn 8	42.7	0.0	9.86	0.00	42.7	Yes
2	Calf Barn 2	0.6	0.0	0.78	0.00	0.6	No

Cow Housing - NH3 Emissions							
	Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)	BACT Triggered?
1	1	2.7	5.1	5.54	10.71	0.1	No
2	2	1.5	5.8	5.54	21.13	0.0	No
3	3	8.8	14.5	10.71	21.13	1.5	No
4	4	8.8	14.5	10.71	21.13	1.5	No
5	5	3.0	14.5	3.00	21.13	0.9	No
6F	6F	23.2	7.9	21.13	21.13	15.3	Yes
6L	6L	23.2	7.9	21.13	21.13	15.3	Yes
7F	7F	23.2	8.0	21.13	21.13	15.2	Yes
7L	7L	23.2	8.0	21.13	21.13	15.2	Yes
	Heifer Barn 1	0.6	1.1	3.00	5.54	0.0	No
	Heifer Barn 2	0.6	1.1	3.00	5.54	0.0	No
	Heifer Barn 3	0.6	1.1	3.00	5.54	0.0	No
	Calf Barn	0.7	4.6	0.90	5.54	-0.1	No
	Corral 1 (removed)	0.0	3.0	0.00	5.54	0.0	No
	Corral 2 (removed)	0.0	3.0	0.00	5.54	0.0	No
	Corral 3 (removed)	0.0	3.0	0.00	5.54	0.0	No
	Corral 4 (removed)	0.0	1.0	0.00	5.54	0.0	No
	Corral 5 (removed)	0.0	1.0	0.00	5.54	0.0	No
	Corral 6 (removed)	0.0	1.0	0.00	5.54	0.0	No
	Corral 7 (removed)	0.0	1.4	0.00	5.54	0.0	No
	Corral 8 (removed)	0.0	1.4	0.00	5.54	0.0	No
	Corral 9 (removed)	0.0	1.4	0.00	5.54	0.0	No
New Units from Expansion							
	Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	PE2 (lb/day)	BACT Triggered?
	Barn 8	91.5	0.0	21.13	0.00	91.5	Yes
	Calf Barn 2	0.7	0.0	0.90	0.00	0.7	No

*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows. BACT applicability has been calculated for EACH emissions unit in this row.

Cow Housing - PM10 Emissions							
	Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)	BACT Triggered?
1	1	0.7	0.7	1.37	1.37	0.0	No
2	2	0.4	0.4	1.37	1.37	0.0	No
3	3	1.1	0.9	1.37	1.37	0.2	No
4	4	1.1	0.9	1.37	1.37	0.2	No
5	5	1.4	0.9	1.37	1.37	0.5	No
6	6F	1.3	0.5	1.17	1.37	0.9	No
7	6L	1.3	1.0	1.17	2.73	0.9	No
8	7F	1.3	0.5	1.17	1.37	0.9	No
9	7L	1.3	1.0	1.17	2.73	0.9	No
10	Heifer Barn 1	0.3	0.3	1.37	1.37	0.0	No
11	Heifer Barn 2	0.3	0.3	1.37	1.37	0.0	No
12	Heifer Barn 3	0.3	0.3	1.37	1.37	0.0	No
13	Calf Barn	1.1	1.1	1.37	1.37	0.0	No
14	Corral 1 (removed)	0.0	5.8	0.00	10.55	0.0	No
15	Corral 2 (removed)	0.0	5.8	0.00	10.55	0.0	No
16	Corral 3 (removed)	0.0	5.8	0.00	10.55	0.0	No
17	Corral 4 (removed)	0.0	1.9	0.00	10.55	0.0	No
18	Corral 5 (removed)	0.0	1.9	0.00	10.55	0.0	No
19	Corral 6 (removed)	0.0	1.9	0.00	10.55	0.0	No
20	Corral 7 (removed)	0.0	2.6	0.00	10.55	0.0	No
21	Corral 8 (removed)	0.0	2.6	0.00	10.55	0.0	No
22	Corral 9 (removed)	0.0	2.6	0.00	10.55	0.0	No
New Units from Expansion							
	Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	PE2 (lb/day)	BACT Triggered?
1	Barn 8	5.0	0.0	1.17	0.00	5.0	Yes
2	Calf Barn 2	1.1	0.0	1.37	0.00	1.1	No

*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows. BACT applicability has been calculated for EACH emissions unit in this row.

Increase in Emissions

SSIFE (lb/yr)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	712	244	0
Cow Housing	0	0	-8,031	0	15,675	37,064	0
Liquid Manure	0	0	0	0	229	3,516	197
Solid Manure	0	0	0	0	748	4,950	0
Feed Handling	0	0	0	0	-579	0	0
Total	0	0	-8,031	0	16,784	45,773	197

Total Daily Change in Emissions (lb/day)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	2.0	0.7	0.0
Cow Housing	0.0	0.0	-22.0	0.0	42.6	101.4	0.0
Liquid Manure	0.0	0.0	0.0	0.0	0.7	9.7	0.5
Solid Manure	0.0	0.0	0.0	0.0	2.1	13.7	0.0
Feed Handling	0.0	0.0	0.0	0.0	-1.6	0.0	0.0
Total	0.0	0.0	-22.0	0.0	45.8	125.5	0.5

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	102	0	0
Solid Manure	0	0	0	0	0	0	0
Feed Handling	0	0	0	0	0	0	0
Total	0	0	0	0	102	0	0

APPENDIX F

BACT Analysis for Dairy ATCs

**San Joaquin Valley
Unified Air Pollution Control District**

Best Available Control Technology (BACT) Guideline X.Y.Z

Emission Unit: Milking Parlor

Industry Type: Agricultural
Operation

Equipment Rating:

Last Update:

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Flush/Spray before, after, or during milking each group of cows		
Ammonia	Flush/Spray before, after, or during milking each group of cows		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source - Permit Specific BACT Determinations on Next Page(s)**

**San Joaquin Valley
Unified Air Pollution Control District**

Best Available Control Technology (BACT) Guideline X.Y.Z

Emission Unit: Dairy Cow Housing – Free Stall and
Saudi-Style Barns

Industry Type: Agricultural Operation

Equipment Rating:

Last Update:

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
PM ₁₀	- Concrete feed lanes and walkways; - Scraping exercise pens every two weeks using pull-type scraper in the morning hours except when prevented by wet conditions		
VOC	- Concrete feed lanes and walkways; - Flushing the lanes and walkways for the mature cows (milk and dry cows) four times per day and flushing lanes and walkways for the remaining animals once per day (or for dairies that cannot use a flush system, Scraping lanes and walkways for mature cows with an automatic scraper (or equivalent) four times per day and cleaning lanes and walkways for support stock (heifers) at least once per day); - Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines; - Properly sloping corrals (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing corrals to maintain a dry surface; - Scraping exercise pens every two weeks using pull-type scraper in the morning hours except when prevented by wet conditions; and - Rule 4570 Measures		
Ammonia	- Concrete feed lanes and walkways; - Flushing the lanes and walkways for the mature cows (milk and dry cows) four times per day and flushing lanes and walkways for the remaining animals once per day (or for dairies that cannot use a flush system, Scraping lanes and walkways for mature cows with an automatic scraper (or equivalent) four times per day and cleaning lanes and walkways for support stock (heifers) at least once per day); - Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines; - Properly sloping corrals (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing corrals to maintain a dry surface; and - Scraping exercise pens every two weeks using pull-type scraper in the morning hours except when prevented by wet conditions;		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source - Permit Specific BACT Determinations on Next Page(s)**

San Joaquin Valley Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 5.7.X*

Last Update: December 18, 2013

Emission Unit: Liquid Manure Handling – Lagoon/Storage Pond

Industry Type: Agricultural
Operation

Equipment Rating:

Last Update:

Emissions Unit: Liquid Manure Handling at Dairies

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Anaerobic treatment lagoon designed according to NRCS Guideline, and solids removal/separation system (mechanical separator(s) or settling basin(s)/weeping wall(s))	1) Aerobic treatment lagoon or mechanically aerated lagoon; 2) Covered lagoon digester vented to a control device with minimum 95% control	
Ammonia	All animals fed in accordance with NRCS or other District-approved guidelines		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

X Quarter 20XX

San Joaquin Valley Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 5.7.X*

Last Update: December 18, 2013

Emission Unit: Liquid Manure Handling – Liquid/Slurry Land Application

Industry Type: Agricultural Operation

Equipment Rating:

Last Update:

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Irrigation of crops using liquid/slurry manure from the secondary lagoon/holding/storage pond preceded by an uncovered anaerobic treatment lagoon designed to meet Natural Resources Conservation Service (NRCS) standards	1) Irrigation of crops using liquid manure from an aerobic treatment lagoon or mechanically aerated lagoon (95% VOC control efficiency) 2) Irrigation of crops using liquid manure from a holding/storage pond after being treated in a covered lagoon/digester (80% VOC control efficiency)	
Ammonia	All animals fed in accordance with NRCS or other District-approved guidelines		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

X Quarter 20XX

**San Joaquin Valley
Unified Air Pollution Control District**

Best Available Control Technology (BACT) Guideline X.Y.Z

Emission Unit: Solid Manure Handling – Land Application

Industry Type: Agricultural Operation

Equipment Rating:

Last Update:

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	1) Rapid incorporation of solid manure into the soil after land application	1) Land Application of Solid Manure Processed by Either an Open or Enclosed Negatively-Aerated Static Pile (ASP) Vented to a biofilter (or equivalent) $\geq 80\%$ destruction efficiency With Rapid Incorporation of the Manure Into the Soil After Land Application; 2) Land Application of Solid Manure Processed by In-Vessel/Enclosed Negatively-Aerated Static Piles vented to biofilter $\geq 80\%$ destruction efficiency 3) Land Application of Solid Manure Processed by Open Negatively-Aerated Static Piles vented to biofilter $\geq 80\%$ destruction efficiency 4) Land Application of Solid Manure Processed by an Open Negatively-Aerated Static Piles (ASP) (With Thick Layer of Bulking Agent or Equivalent) With Rapid Incorporation of the Manure Into the Soil After Land Application	
Ammonia	1) Rapid incorporation of solid manure into the soil after land application, and all animals fed in accordance with NRCS or other District-approved guidelines		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

San Joaquin Valley Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline X.X.X*

Last Update: December 18, 2013

Emission Unit: Solid Manure Handling –
Storage/Separated Solids Piles

Industry Type: Agricultural
Operation

Equipment Rating:

Last Update:

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
Ammonia	All animals fed in accordance with NRCS or other District- approved guidelines		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

*This is a Summary Page for this Class of Source

X Quarter 20XX

San Joaquin Valley Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 5.7.X*

Last Update: XXXX XX, 2015

Emissions Unit: Dairy Feed Storage and Handling System – Total Mixed Ration (TMR)

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	District Rule 4570 Measures		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

Trinkler Dairy (N-6208, Project N-1150266)

TOP-DOWN BACT ANALYSIS

I. Top Down BACT Analysis for the Milking Parlor (Permit N-6208-1)

1. BACT Analysis for VOC Emissions from the Milking Parlor

a. Step 1 - Identify all control technologies

The following option has been identified as a possible control for VOC emissions from the milking parlor:

- 1) Flush/spray before, after, or during milking each group of cows

Description of Control Technology

Flush/Spray Before, After, or During Milking Each Group of Cows

Almost all dairy operations utilize some type of flush or spray system to wash out the manure that's deposited in the milking parlor. The primary purpose of the flush or spray system is to maintain the minimum level of sanitation required in the milking parlor. However, this system also serves as an emission control for reducing VOC and ammonia emissions. The manure deposited in the milking parlor, which is a source of VOC emissions, is removed many times a day by flushing. Many of the VOCs emitted from fresh cow manure, such as alcohols (ethanol and methanol) and many Volatile Fatty Acids (VFAs), are highly soluble in water. Therefore, a large percentage of these compounds will dissolve in the flush water and will not be emitted into the air. The flush water can then carry the manure and the dissolved volatile compounds to an anaerobic treatment system where they are digested by microbial activity and converted into less polluting compounds such as methane and carbon dioxide.

b. Step 2 - Eliminate technologically infeasible options

The option identified in step 1 is technologically feasible.

c. Step 3 - Rank remaining options by control effectiveness

Only one option was previously identified in step 1:

- 1) Flush/spray before, after, or during milking each group of cows

d. Step 4 - Cost Effectiveness Analysis

Flush/Spray Before, After, or During Milking Each Group of Cows

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

e. Step 5 - Select BACT

The applicant has proposed to flush/spray the milking parlor before, after, or during milking each group of cows. The proposal satisfies BACT for this category.

II. Top Down BACT Analysis for the Cow Housing Permit Unit (N-6208-2)

1. BACT Analysis for VOC Emissions from Freestalls 6, 7, and 8

a. Step 1 - Identify all control technologies

The following options have been identified as possible controls for VOC emissions from freestalls:

1) Feed and Manure Management Practices

- Concrete feed lanes and walkways;
- Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
- Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;
- Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage;
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions; and
- Rule 4570 measures.

Description of Control Technologies

Concrete feed lanes and walkways

Dairy cows spend a large proportion of time on the feed lanes and walkways. A significant proportion of manure is consequently deposited in these areas. The concrete lanes and walkways are necessary for an effective flush system, which in turn is a key component of management practices used for the control of VOC and ammonia emissions (see below).

Increased flushing of feed lanes and walkways

Many dairy operations use a flush system to remove manure from the feed lanes and walkways. The flush system introduces a large volume of water at the head of the paved area, and the cascading water carries the manure downslope. The required volume of flush water varies with the size and slope of the area to be flushed.

In addition to cleaning the feed lanes and walkways, the flush system also serves as an emissions control method. Many of the VOCs emitted from fresh cow manure, such as alcohols (ethanol and methanol) and many Volatile Fatty Acids (VFAs), are highly soluble in water. Therefore, a large proportion of these compounds will dissolve in the flush water instead of being emitted directly from the housing areas. The flush water then carries the manure and the dissolved volatile compounds into an anaerobic

treatment system where they are digested and converted into less polluting byproducts by microbial activity.

Feed lanes and walkways are typically flushed once or twice per day in the mature cow housing areas; and as infrequently as once a week in the support stock housing areas. Flushing the lanes four times per day for mature cows and once per day for support stock will increase the frequency with which manure is removed from the housing areas, which should result in a higher percentage of soluble volatile compounds being captured in the flush water, and therefore higher control efficiency. Although the control efficiency may actually be much higher, increasing the cleaning frequency of the lanes will be conservatively assumed to have a control efficiency of 10% for VOCs emitted from manure in cow housing areas, until better data becomes available.

Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for VOC emissions can be reduced by reducing the quantity of undigested nutrients in the manure. Many of the VOCs emitted from Confined Animal Facilities, including dairies, originate from the decomposition of undigested protein in animal waste.¹⁵ This undigested protein also produces ammonia emissions. The level of microbial action in the manure corresponds to the level of organic nitrogen content in the manure; the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia and VOCs.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOCs and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure.

Based on very limited data (Klaunser, 1998, *J Prod Agric*), diet manipulation decreased nitrogen excretion by 34% while improving milk production. Up to 70% of excess nitrogen is lost off of the farm through volatilization, denitrification and leaching. Because of limited research, feeding cows in accordance with National Research Council (NRC) or other District-approved guidelines will be conservatively assumed to have a control efficiency of only 5-10% for both enteric¹⁶ and manure VOC emissions.

Properly sloping exercise pens

Accumulation of water on exercise pen surfaces, due to rain or on-farm activities, could result in anaerobic conditions and thereby increase emissions. Keeping exercise pen

¹⁵ "Emissions of Volatile Organic Compounds Originating from UK Livestock Agriculture", Hobbs, P.J. 2004 – Journal of the Science of Food and Agriculture.

¹⁶ Enteric emissions are those emitted directly from the animal (primarily via belching and flatulence), due to feed digestion processes.

surfaces dry and properly aerated, on the other hand, promotes the aerobic conditions that reduce emissions. Proper slope design is therefore required to ensure that drainage of any water deposited on the exercise pen surfaces will be as rapid as possible.

Scraping of exercise pens/ with a pull-type scraper

Frequent scraping of the freestall exercise pens will reduce the amount of manure on the pen surfaces, which will reduce VOC and ammonia emissions resulting from decomposition of this manure. This practice will also provide a uniform surface that promotes aerobic conditions on the exercise pen surface, which will reduce gaseous pollutants from this area.

District Rule 4570 measures

District Rule 4570 requires the implementation of various management practices to reduce VOC emissions. The following District Rule 4570 requirements for freestall barns are also required by BACT and have already been listed above. These practices include the following: pave feedlanes for a width of at least eight feet along housing side for mature cows and at least six feet along housing side of feedlane fence for heifers; increased flush of freestall lanes and walkways; remove freestall manure that is not dry or rake, harrow, scrape or grade at least once every seven days; inspect water pipes and troughs and repair leaks every seven days; clean manure from corrals at least four times per year; properly sloping exercise pens and corrals; and manage corral depth to twelve inches.

b. Step 2 - Eliminate technologically infeasible options

All the options identified in step 1 are technologically feasible.

c. Step 3 - Rank remaining options by control effectiveness

All the options identified in step 1 are assumed to each have the same control effectiveness:

1) Feed and Manure Management Practices

- Concrete feed lanes and walkways;
- Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
- Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;
- Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage;

- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions; and
- Rule 4570 measures.

d. Step 4 - Cost Effectiveness Analysis

Feed and Manure Management Practices

- Concrete feed lanes and walkways;
- Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
- Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;
- Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage;
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions; and
- Rule 4570 measures.

The applicant has proposed these options. In addition, these options are achieved in practice. A cost effectiveness analysis is therefore not required.

e. Step 5 - Select BACT

The applicant has proposed the following feed and manure management practices:

- Concrete feed lanes and walkways;
- Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
- Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;
- Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage;
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions; and
- Rule 4570 measures.

The proposal satisfies BACT for this category.

2. BACT Analysis for NH₃ Emissions from Freestalls 6, 7, and 8

a. Step 1 - Identify all control technologies

The following options have been identified as possible controls for ammonia emissions freestalls:

1) Feed and Manure Management Practices

- Concrete feed lanes and walkways;
- Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
- Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;
- Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage; and
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions.

Description of Control Technologies

Concrete feed lanes and walkways

Dairy cows spend a large proportion of time on the feed lanes and walkways. A significant proportion of manure is consequently deposited in these areas. The concrete lanes and walkways are necessary for an effective flush system, which in turn is a key component of management practices used for the control of VOC and ammonia emissions (see below).

Increased Flushing for feed lanes and walkways

Many dairy operations use a flush system to remove manure from the feed lanes and walkways. The flush system introduces a large volume of water at the head of the paved area, and the cascading water carries the manure downslope. The required volume of flush water varies with the size and slope of the area to be flushed.

In addition to cleaning the feed lanes and walkways, the flush system also serves as an emissions control method. Ammonia is highly soluble in water. Therefore, a large proportion of ammonia in manure will dissolve in the flush water instead of being emitted directly from the housing areas. The flush water then carries the manure and the dissolved ammonia into the liquid manure storage system, where ammonia can be sequestered until it is applied to cropland as a nitrogen fertilizer.

Feed lanes and walkways are typically flushed once or twice per day in the mature cow housing areas; and as infrequently as once a week in the support stock housing areas. Flushing the lanes four times per day for mature cows and once per day for support stock will increase the frequency with which manure is removed from the housing areas, which should result in a higher percentage of ammonia being captured in the flush water, and therefore higher control efficiency.

Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for ammonia emissions can be reduced by reducing the amount of undigested nitrogen compounds in the manure. The level of microbial action in the manure corresponds to the level of organic nitrogen present, hence the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOC and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure.

Properly sloping exercise pens

Accumulation of water on exercise pen surfaces, due to rain or on-farm activities, could result in anaerobic conditions and thereby increase emissions. Keeping exercise pen surfaces dry and properly aerated, on the other hand, promotes the aerobic conditions that reduce emissions. Proper slope design is therefore required to ensure that drainage of any water deposited on the exercise pen surfaces will be as rapid as possible.

Scraping of exercise pens/corrals with a pull-type scraper

Frequent scraping the freestall exercise pens/corrals will reduce the amount of manure on the pen/corral surfaces, which will reduce VOC and ammonia emissions resulting from decomposition of this manure. This practice will also provide a uniform surface that promotes aerobic conditions on the pen/corral surface, which will reduce gaseous pollutants from this area.

b. Step 2 - Eliminate technologically infeasible options

All the options identified in step 1 are technologically feasible.

c. Step 3 - Rank remaining options by control effectiveness

All the options identified in step 1 are assumed to each have the same control effectiveness:

1) Feed and Manure Management Practices

- Concrete feed lanes and walkways;
- Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
- Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;
- Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage; and
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions.

d. Step 4 - Cost Effectiveness Analysis

Feed and Manure Management Practices

- Concrete feed lanes and walkways;
- Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
- Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;
- Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage; and
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions.

The applicant has proposed these options. In addition, these options are achieved in practice. A cost effectiveness analysis is therefore not required.

e. Step 5 - Select BACT

The applicant has proposed the following feed and manure management practices:

- Concrete feed lanes and walkways;
- Flushing feed lanes and walkways for mature cows (milk and dry cows) at least four times per day and flushing feed lanes and walkways for support stock at least once per day;
- Feeding all animals in accordance with National Research Council (NRC) or other District-approved guidelines;

- Properly sloping exercise pens (minimum of 3% slope where the available space for each animal is 400 square feet or less and minimum of 1.5% where the available space for each animal is more than 400 square feet per animal) or managing exercise pens to ensure proper drainage; and
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions.

The proposal satisfies BACT for this category.

3. BACT Analysis for PM₁₀ Emissions from Freestall #8

a. Step 1 - Identify all control technologies

The following options have been identified as possible controls for PM₁₀ emissions from freestalls:

1) Manure Management Practices

- Concrete feed lanes and walkways; and
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions;

Description of Control Technologies

Concrete feed lanes and walkways

Constructing the feed lanes and walkways of concrete causes the dairy animals to spend an increased amount of time on a paved surface rather than dry dirt, thus reducing PM₁₀ emissions. Additionally, the manure that is deposited in the lanes and walkways will be flushed, which will prevent PM₁₀ emissions from drying manure.

Scraping of exercise pens with a pull-type scraper

Other than the paved feed lanes and walkways, exercise pen surfaces are composed of earth and deposited manure, both of which have the potential for particulate matter emissions due to wind or animal activities. Frequent scraping of these surfaces will reduce the amount of dry manure that may be pulverized by the cows' hooves and subsequently emitted as PM₁₀.

b. Step 2 - Eliminate technologically infeasible options

The options listed in Step 1 above are both technologically feasible.

c. Step 3 - Rank remaining options by control effectiveness

Both of the options identified in step 1 are assumed to each have the same control effectiveness:

1) Manure Management Practices

- Concrete feed lanes and walkways; and
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions;

d. Step 4 - Cost Effectiveness Analysis

Manure Management Practices

- Concrete feed lanes and walkways; and
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions;

The applicant has proposed these options. In addition, these options are achieved in practice. A cost effectiveness analysis is therefore not required.

e. Step 5 - Select BACT

The applicant has proposed the following manure management practices:

- Concrete feed lanes and walkways; and
- Scraping exercise pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions.

The proposal satisfies BACT for this category.

III. Top Down BACT Analysis for the Liquid Manure Handling System – Lagoon/Storage Pond (N-6208-3)

1. BACT Analysis for VOC Emissions from the Lagoon/Storage Pond

a. Step 1 - Identify all control technologies

The following options were identified as possible controls for VOC emissions from the lagoons & storage ponds:

- 1) Aerobic treatment lagoon or mechanically aerated lagoon
- 2) Covered lagoon digester vented to a control device with minimum 95% control
- 3) Anaerobic treatment lagoon designed according to NRCS guidelines, and solids removal/separation system (mechanical separator(s) or settling basin(s)/weeping wall(s))

Description of Control Technologies

1) Aerobic Treatment Lagoon or Mechanically Aerated Lagoon

An aerobic lagoon is a waste treatment lagoon that is designed to facilitate the decomposition of wastewater by microbes in the presence of oxygen (O₂). The process of aerobic decomposition results in the conversion of organic compounds in the wastewater into carbon dioxide (CO₂), and (H₂O), nitrates, sulfates, and inert biomass (sludge). This process is sometimes referred to as nitrification (especially when discussing NH₃ transformation). Complete aerobic decomposition (100% aeration) removes nearly all malodors and also virtually eliminates VOC, H₂S, and NH₃ emissions.

In completely aerated lagoons, sufficient oxygen must be provided to sustain the aerobic microorganisms. NRCS Practice Standard Code 359 specifies that naturally aerobic lagoons have a minimum surface area determined by regional climate and daily Biological Oxygen Demand (BOD₅) and requires naturally aerobic lagoons to have a maximum depth no greater than five feet. For mechanically aerated lagoons, NRCS Practice Standard Code 359 specifies that the aeration equipment shall provide a minimum of 1 pound of oxygen for each pound of daily BOD₅ loading. The mechanical aerators that provide the required oxygen may float on the lagoon surface or be submerged in the lagoon. Aeration can also be performed by injection of tiny air bubbles into the lagoon water, mixing of the lagoon water, or spraying of the water into the air. According to Dr. Ruihong Zhang, a researcher at the University of California, Davis, at least 95% VOC control can be achieved if the dissolved oxygen (DO) concentration of the liquid manure is 2.0 mg/L or more. However, the DO concentrations achieved in mechanically aerated lagoons treating manure are typically much less than this and the control efficiencies will therefore be lower.

2) Covered Lagoon Digester

Covered treatment lagoons are one type of anaerobic digester. An anaerobic digester is an enclosed basin or tank that is designed to facilitate the decomposition of

wastewater by microbes in the absence of oxygen. The process of anaerobic decomposition results in the preferential conversion of organic compounds in the wastewater into methane (CH_4), carbon dioxide (CO_2), and water rather than intermediate metabolites (VOC). The gas generated by this process is known as biogas, waste gas or digester gas. In addition to methane and carbon dioxide, biogas also contains small amounts of Nitrogen (N_2), Oxygen (O_2), Hydrogen Sulfide (H_2S), and Ammonia (NH_3). Biogas will also include trace amounts of various Volatile Organic Compounds (VOCs) that remain from incomplete digestion of the volatile solids in the incoming wastewater. The small amounts of undigested solids that remain after digestion are removed from the digester as sludge. Because biogas is mostly composed of methane, the main component of natural gas, the gas produced in the digester can be cleaned to remove H_2S and other impurities and used as fuel. The captured biogas can be combusted in a flare or may be sent to a boiler or internal combustion engine, where the gas can be used to generate useful heat or electrical energy.

As stated above, the gas generated in the covered lagoon anaerobic digester can be captured and then sent to a suitable combustion device. During combustion, gaseous hydrocarbons are oxidized to form CO_2 and water. The VOC emitted from the liquid manure in the covered lagoon can be reduced by 95% with the use of an appropriate combustion device. Therefore, installation of the digester will lower the total VOC emitted from the liquid manure handling system. Although the control efficiency of the gas captured from the primary lagoon is expected to be 95% or more, the overall control efficiency is expected to be less, since some VOC will also be emitted from the storage pond and as fugitive emissions. For this analysis, the overall control efficiency is assumed to be 80% of the emissions that would have been emitted from the lagoon system.

3) Anaerobic Treatment Lagoon and Solids Removal/Separation System

An anaerobic treatment lagoon is a waste treatment lagoon that is designed to facilitate the decomposition of manure by microbes in the absence of oxygen. The process of anaerobic decomposition results in the preferential conversion of organic compounds in the wastewater into methane (CH_4), carbon dioxide (CO_2), and water rather than intermediate metabolites (VOC). The Natural Resources Conservation Service (NRCS) Field Office Technical Guide No. 359, Waste Treatment Lagoon, for California specifies the following criteria for the design of anaerobic treatment lagoons:

- Required volume - the minimum design volume should account for all potential sludge, treatment, precipitation, and runoff volumes.
- Treatment period - retention time of the material in the lagoon shall be the time required to provide environmentally safe utilization of waste. The minimum hydraulic retention time for a covered lagoon in the San Joaquin Valley is about 38 days.
- Waste loading shall be based on the maximum daily loading considering all waste sources that will be treated by the lagoon. The loading rate is typically based on volatile solids (VS) loading per unit of volume. The suggested loading

rate for the San Joaquin Valley is 6.5-11 lb-VS/1000 ft³/day depending on separation and type of system.

- The operating depth of the lagoon shall be 12 feet or greater. Maximizing the depth of the lagoon minimizes the surface area, which in turn minimizes the cover size and cost. Increasing the lagoon depth has the following advantages:
 - Minimizes surface area in contact with the atmosphere, thus reducing surface available to convection, evaporation
 - Smaller surface areas provide a more favorable and stable environment for methane bacteria
 - Better mixing of lagoon due to rising gas bubbles
 - Requires less land
 - More efficient for mechanical mixing

The lagoon design shall also consider location, soils and foundation, erosion, and depth to groundwater as required by the regional water control board.

The NRCS guideline suggests that this system consist of two cells, a treatment lagoon (primary lagoon) and a storage pond (secondary lagoon). The first stage of the lagoon system is the biological treatment stage and is designed with a constant liquid level to stabilize the anaerobic digestion. The effluent from the first stage overflows into a second lagoon designed for liquid storage capacity. Effluent from the second lagoon is used in the flush lanes and for the irrigation of cropland. The secondary (overflow) lagoon acts as the storage pond, which can be emptied when necessary. However, a single lagoon can also be considered an anaerobic lagoon as long as all the criteria are met and that the liquid manure is not drawn less than 6 feet at any time.

A properly designed anaerobic treatment lagoon will reduce the volatile solids (VS) by at least 50%. This will reduce the biological oxygen demand (BOD) and increase the efficiency at which organic compounds are converted into methane and carbon dioxide rather than VOC. Although the VS reduction is expected to be at least 50%, a conservative control efficiency of 40% will be assumed, until better data becomes available.

Solids Removal/Separation - Mechanical Separator(s)

Mechanical separators separate solids out from the liquid/slurry stream. There are many different versions of separators on the market. The percentage of separation varies depending on screen size and type of separation system. However, 50% solid removal efficiency is used as a general rule of thumb. Although the separation efficiency can be improved by better separation or addition of separators or screens, it does not necessarily result in an increase in VOC emission reduction. The type of solids removed are generally non-digestible (lignins, cellulose, etc.) materials that do not easily degrade in the lagoons. The amount of volatile solids that ends up in the lagoon will most likely not change even though there is an increase in solid removal efficiency. In addition, there is no data that links higher removal efficiency with an increase in VOC emission reduction.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

The remaining options are ranked below according to their control effectiveness:

- 1) Aerobic treatment lagoon or mechanically aerated lagoon (95% control efficiency)
- 2) Covered lagoon digester vented to a control device (80% control efficiency)
- 3) Anaerobic treatment lagoon designed to meet Natural Resources Conservation Service (NRCS) standards (40% control efficiency)
- 4) Solids Removal/Separation

d. Step 4 - Cost Effectiveness Analysis

Aerobic Treatment Lagoon or Mechanically Aerated Lagoon

Aerobic Treatment Lagoon

NRCS Practice Standard Code 359 requires that naturally aerobic lagoons be designed to have a minimum treatment surface area as determined on the basis of daily BOD₅ loading per unit of lagoon surface. The standard specifies that the maximum loading rate of naturally aerobic lagoons shall not exceed the loading rate indicated by the NRCS Agricultural Waste Management Field Handbook (AWMFH) or the maximum loading rate according to state regulatory requirements, whichever is more stringent. According to Figure 10-30 (August 2009) of the latest version of the AWMFH, the maximum aerobic lagoon loading rate for the San Joaquin Valley is 45 - 55 lb-BOD₅/acre-day. According to Table 4-5 (March 2008) of the NRCS AWMFH, the total daily manure produced by a milk cow will have 2.9 lb-BOD₅/day. Assuming that at least 80% of the manure will be flushed to the lagoon system, the minimum lagoon surface area required for a naturally aerobic lagoon treating manure from 3,180 milk cows in the San Joaquin Valley can be calculated as follows:

$$\begin{aligned}\text{BOD}_5 \text{ loading (lb/day)} &= 3,180 \text{ milk cows} \times 2.9 \text{ lb-BOD}_5/\text{cow-day} \times 0.80 \\ &= 7,377.6 \text{ lb-BOD}_5/\text{day}\end{aligned}$$

$$\begin{aligned}\text{Minimum Surface Area (acres)} &= 7,377.6 \text{ lb-BOD}_5/\text{day} \div 55 \text{ lb-BOD}_5/\text{acre-day} \\ &= 134.1 \text{ acres}\end{aligned}$$

As shown above, the minimum surface area required for a naturally aerobic lagoon to treat manure from the proposed number of milk cows is 134.1 acres. This does not include the additional surface area that would be required to treat manure from dry cows or support stock. Based on the space requirements alone it is clear that this option cannot reasonably be required and no further analysis is needed.

Mechanically Aerated Lagoon

As discussed above, the very large space requirements for naturally aerobic lagoons cause this option to be infeasible for most confined animal facilities. Mechanically aerating a lagoon can achieve some of the benefits of a naturally aerobic lagoon without the large space requirements. However, the costs of energy for complete aeration have also caused this option to be infeasible. The amount of energy required for aeration is based on the amount of volatile solids that must be treated; thus, this cost will be directly proportional to the number of cows. The following analysis will determine the cost of emission reductions that can be achieved from a mechanically aerated lagoon treating manure from the proposed milk cow herd.

Biological Oxygen Demand (BOD₅)

In order to effectively calculate the cost of this control option, the energy requirement for complete aeration must be determined. It should be noted that approximately 1.5 to 2.5 pounds of oxygen is required to digest 1 pound of Biological Oxygen Demand (BOD₅) with additional oxygen required for conversion of ammonia to nitrate (nitrification). It is generally accepted that at least twice the BOD should be provided for complete aeration. According to Dr. Ruihong Zhang of the University of California, Davis, 2.4 lb (1.1 kg) of oxygen per cow must be provided each day for removal of BOD and an additional 3 lb (1.4 kg) per cow for oxidation of 70% of the nitrogen.

The proposed rule specifies that an aerobic lagoon be designed and operated in accordance with NRCS Practice Standard Code 359. NRCS Practice Standard Code 359 requires that mechanically aerated lagoons use aeration equipment that provides a minimum of one pound of oxygen for each pound of daily BOD₅ loading. As discussed above, the total daily manure produced by a milk cow will have a BOD₅ of 2.9 lb/day and a lagoon handling flushed manure from 3,180 milk cows will have a loading rate of approximately 7,377.6 lb- BOD₅/day (3,346.7 kg-BOD₅/day).

Energy Requirement

Based on the data gathered in a UC Davis study on aerator performance for wastewater lagoons, aeration efficiencies for mechanical aerators ranged from 0.10 to 0.68 kg of oxygen provided per kW-hr of energy utilized. The most efficient aerator tested that had been installed in dairy lagoons had an aeration efficiency of 0.49 kg-O₂/kW-hr. These efficiency tests were performed in clean water and lower aeration efficiencies are expected in liquid manure because of the significant amount of solids that it contains. The yearly energy requirement for a mechanically aerated lagoon system treating flushed manure from 3,180 milk cows is calculated as follows:

$$3,346.7 \text{ kg-BOD}_5/\text{day} \div (0.68 \text{ kg-O}_2/\text{kW-hr}) \times (365 \text{ day/year}) = 1,796,390 \text{ kW-hr/year}$$

Cost of Electricity

The cost of electricity will be based upon the average price for industrial electricity in California as of October 2016, as taken from the Energy Information Administration (EIA) website:¹⁷

$$\text{Average cost of electricity} = \$0.1217/\text{kW-hr}$$

The electricity cost for complete aeration is calculated as follows:

$$1,796,390 \text{ kW-hr/year} \times \$0.1217/\text{kW-hr} = \$218,621/\text{year}$$

VOC Emissions Reductions

It will be conservatively assumed that a mechanically aerated lagoon providing 1 lb of oxygen for every 1 lb of BOD₅ loading will control 90% of the VOC emissions from the lagoon/storage pond. However, as noted above, it is generally accepted that the oxygen provided should be twice the BOD₅ loading rate for complete aeration. Thus, the actual control from providing 1 lb of oxygen for every 1 lb of BOD₅ loading is probably in the 50% range.

The annual VOC emissions reductions are calculated as:

$$\begin{aligned} & [\text{Number of cows}] \times [\text{Lagoon/Storage Pond VOC EF (lb/cow-year)}] \times [\text{Complete Aeration Control Efficiency for Lagoon/Storage Pond}] \\ &= 3,180 \text{ cows} \times 1.3 \text{ lb-VOC/cow-yr} \times 90\% \text{ control} \\ &= 3,721 \text{ lb-VOC/yr} \end{aligned}$$

Cost of Reductions

$$\begin{aligned} \text{Cost of reductions} &= (\$218,621/\text{year}) / [(3,721 \text{ lb-VOC/year})(1 \text{ ton}/2000 \text{ lb})] \\ &= \$117,507/\text{ton} \end{aligned}$$

As shown above, based on the cost of electricity alone, the cost of the VOC reductions for this control option is greater than the \$17,500/ton cost effectiveness threshold specified by the District's BACT policy. This control option is therefore not cost effective and will not be required.

Covered Lagoon Digester

Capital Cost for Installation

The capital cost estimates for installation of a covered lagoon digester are based on information from the United States EPA AgSTAR publication "Anaerobic Digestion Capital Costs for Dairy Farms" (May 2010)¹⁸ and the California Energy Commission (CEC) Public Interest Energy Research (PIER) Program Dairy Methane Digester

¹⁷ http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_06_b

¹⁸ "Anaerobic Digestion Capital Costs for Dairy Farms" (May 2010), EPA AgSTAR http://www.epa.gov/agstar/pdf/digester_cost_fs.pdf

System Program Evaluation Report (Feb 2009).¹⁹ The formula in the AgSTAR publication results in a capital cost of \$1,032 per cow. This estimate excludes costs of solids separation after digestion, hydrogen sulfide removal, and utility charges including line upgrades and interconnection costs and fees. Based on information from installations in California, the CEC PIER Dairy Methane Digester Program Evaluation Report gives an average cost of \$585 per cow for installation of covered lagoon anaerobic digesters (see Table 9 - Total Project Costs and Cost per Cow and per kW).

For the purposes of this analysis, the more conservative capital cost of \$585/cow will be used. Thus, the installation capital cost for the proposed herd of 3,180 milk cows is at least \$1,860,300 (\$585/cow x 3,180 cows).

Pursuant to the District's BACT policy, the equivalent annual cost will be calculated using the capital recovery equation, as shown below:

$$A = P \frac{i(1+i)^n}{(1+i)^n - 1}$$

Where:

- A = Equivalent annual capital cost of the control equipment
- P = Present value of the control equipment, including installation cost
- i = Interest rate (assumed to be 10%)
- n = Equipment life (assumed to be 10 years)

$$\begin{aligned} A &= [\$1,860,300 \times 0.1(1.1)^{10}] / [(1.1)^{10} - 1] \\ &= \$302,671/\text{year} \end{aligned}$$

Potential Production of Electricity

It may be possible to offset some of the installation costs of a covered lagoon anaerobic digester with revenue from generation of electricity. Based on the information given in the CEC PIER Dairy Methane Digester Program Evaluation Report, Table 7 – Actual Generation per Cow Comparisons, California dairies that used a covered lagoon digester to produce electricity generated between 429.1 and 1,031.8 kW-hr/yr per lactating cow with an overall per facility average generation rate of 670.3 kW-hr/yr per lactating cow. This average annual generation rate is actually higher than all the facilities included in the average except one that had a very high generation rate. In addition, this average may overestimate the per-cow generation potential because the contributions of support stock to the digesters were not accounted for. However, for more conservative calculations, this average will be used to calculate the potential annual savings in electricity costs.

¹⁹ "Dairy Power Production Program – Dairy Methane System Program Evaluation Report" (February 2009). Western United Resource Development, Inc. prepared for the California Energy Commission (CEC) Public Interest Energy Research Program. (CEC-500-2009-009) <http://www.energy.ca.gov/2009publications/CEC-500-2009-009/CEC-500-2009-009.PDF>

The potential quantity of electricity produced is calculated as follows:

$$\begin{aligned}\text{Electrical Produced} &= 670.3 \text{ kW-hr}/(\text{milk cow-yr}) \times 3,180 \text{ milk cows} \\ &= 2,131,554 \text{ kW-hr/yr}\end{aligned}$$

Potential Cost Savings from Production of Electricity

The value of electricity generated will be calculated using the previously cited EIA rate of \$0.1217/kW-hr.

$$\begin{aligned}\text{Potential Cost Savings} &= 2,131,554 \text{ kW-hr/yr} \times \$0.1217/\text{kW-hr} \\ &= \$259,410/\text{yr}\end{aligned}$$

The annualized capital cost less the potential savings from electricity produced is
\$43,261/year = \$302,671/year - \$259,410/year

VOC Emissions Reductions

The annual VOC emissions reductions are calculated as:

$$[\text{Number of cows}] \times [\text{Lagoon/Storage Pond VOC EF (lb/cow-year)}] \times [\text{Covered Lagoon Digester Efficiency for Lagoon/Storage Pond}]$$

$$\begin{aligned}3,180 \text{ cows} \times 1.3 \text{ lb-VOC/cow-yr} \times 80\% \text{ control} \\ = 3,307 \text{ lb-VOC/yr}\end{aligned}$$

Cost of Reductions

$$\begin{aligned}\text{Cost of reductions} &= (\$43,261/\text{year})/[(3,307 \text{ lb-VOC/year})(1 \text{ ton}/2000 \text{ lb})] \\ &= \$26,163/\text{ton}\end{aligned}$$

As shown above, based the installation cost alone, after offsetting this cost by potential savings from electricity produced, the cost of the VOC reductions for this control option is greater than the \$17,500/ton cost effectiveness threshold specified by the District's BACT policy. This control option is therefore not cost effective and will not be required.

Anaerobic Treatment Lagoon and Solids Removal/Separation System

The applicant has proposed these options. In addition, these options are achieved in practice. Cost effectiveness analyses are therefore not required.

e. Step 5 - Select BACT

The applicant has proposed an anaerobic treatment system designed according to NRCS guidelines, and a solids removal/separation system (mechanical separator(s)). The proposal satisfies BACT for this category.

2. BACT Analysis for NH₃ Emissions from the Lagoon/Storage Pond

a. Step 1 - Identify all control technologies

The following option was identified as a possible control for NH₃ emissions from the lagoons & storage ponds:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

Description of Control Technology

- 1) All animals fed in accordance with NRC or other District-approved guidelines

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for ammonia emissions can be reduced by reducing the amount of undigested nitrogen compounds in the manure. The level of microbial action in the manure corresponds to the level of organic nitrogen content in the manure; the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia and VOCs.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOCs and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure, which will reduce ammonia emissions from the liquid manure in the lagoon and storage pond.

b. Step 2 - Eliminate technologically infeasible options

The option listed in Step 1 above is technologically feasible.

c. Step 3 - Rank remaining options by control effectiveness

The remaining option is listed below:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

e. Step 5 - Select BACT

The applicant has proposed to feed all animals in accordance with NRC or other District-approved guidelines. The proposal satisfies BACT for this category.

IV. Top-Down BACT Analysis for the Liquid Manure Handling System – Liquid Manure Land Application (N-6208-3)

1. BACT Analysis for VOC Emissions from Liquid Manure Land Application

a. Step 1 - Identify all control technologies

The following options were identified as possible controls for VOC emissions from land application of manure:

- 1) Irrigation of crops using liquid manure from an aerobic treatment lagoon or mechanically aerated lagoon
- 2) Irrigation of crops using liquid manure from a holding/storage pond after being treated in a covered lagoon/digester
- 3) Irrigation of crops using liquid/slurry manure from the secondary lagoon/holding/storage pond preceded by an uncovered anaerobic treatment lagoon designed to meet Natural Resources Conservation Service (NRCS) standards

Description of Control Technologies

- 1) Irrigation of crops using liquid/slurry manure from an aerobic treatment lagoon or mechanically aerated lagoon

An aerobic lagoon is a waste treatment lagoon that is designed to facilitate the decomposition of wastewater by microbes in the presence of oxygen (O_2). The process of aerobic decomposition results in the conversion of organic compounds in the wastewater into carbon dioxide (CO_2), and (H_2O), nitrates, sulfates, and inert biomass (sludge). This process is sometimes referred to as nitrification (especially when discussing NH_3 transformation). Complete aerobic decomposition (100% aeration) removes nearly all malodors and also virtually eliminates VOC, H_2S , and NH_3 emissions.

In completely aerated lagoons, sufficient oxygen must be provided to sustain the aerobic microorganisms. NRCS Practice Standard Code 359 specifies that naturally aerobic lagoons have a minimum surface area determined by regional climate and daily Biological Oxygen Demand (BOD_5) and requires naturally aerobic lagoons to have a maximum depth no greater than five feet. For mechanically aerated lagoons, NRCS Practice Standard Code 359 specifies that the aeration equipment shall provide a minimum of 1 pound of oxygen for each pound of daily BOD_5 loading. The mechanical aerators that provide the required oxygen may float on the lagoon surface or be submerged in the lagoon. Aeration can also be performed by injection of tiny air bubbles into the lagoon water, mixing of the lagoon water, or spraying of the water into the air. According to Dr. Ruihong Zhang, a researcher at the University of California, Davis, at least 95% VOC control can be achieved if the dissolved oxygen (DO) concentration of the liquid manure is 2.0 mg/L or more. However, the DO concentrations achieved in mechanically aerated lagoons treating manure are typically much less than this and the control efficiencies will therefore be lower.

2) Irrigation of crops using liquid/slurry manure from a holding/storage pond after being treated in a covered lagoon/digester

This practice would only allow the irrigation of liquid manure to cropland from the secondary lagoon after proper treatment has taken place in a covered lagoon/anaerobic digester. Covered treatment lagoons are one type of anaerobic digester. An anaerobic digester is an enclosed basin or tank that is designed to facilitate the decomposition of wastewater by microbes in the absence of oxygen. The process of anaerobic decomposition results in the preferential conversion of organic compounds in the wastewater into methane (CH_4), carbon dioxide (CO_2), and water rather than intermediate metabolites (VOC). The gas generated by this process is known as biogas, waste gas or digester gas. In addition to methane and carbon dioxide, biogas also contains small amounts of Nitrogen (N_2), Oxygen (O_2), Hydrogen Sulfide (H_2S), and Ammonia (NH_3). Biogas will also include trace amounts of various VOC that remain from incomplete digestion of the volatile solids in the incoming wastewater. The small amounts of undigested solids are removed from the digester as sludge.

Assumptions:

- 80% of the Volatile Solids (VS) can be removed from the covered anaerobic digestion process.
- 20% of the remaining VS will be assumed to be in the manure during land application. This will be considered worst-case because further digestion of the VS is likely to occur in the secondary lagoon.
- As a worst-case scenario, it will be assumed that all remaining VS will be emitted as VOC during land application.

Since 80% of the VS is removed or digested in the covered lagoon and the remaining VS have been assumed to be emitted as VOC, a control efficiency of 80% can be used for land application of liquid manure from a holding/storage pond after treatment in a covered lagoon.

3) Irrigation of crops using liquid/slurry manure from the secondary lagoon/holding/storage pond where preceded by an uncovered anaerobic treatment lagoon designed to meet Natural Resources Conservation Service (NRCS) standards

This practice would only allow the irrigation of liquid manure to cropland from the secondary lagoon after going through a treatment phase in an anaerobic treatment lagoon, or the primary lagoon.

An anaerobic treatment lagoon is a waste treatment lagoon that is designed to facilitate the decomposition of manure by microbes in the absence of oxygen. The process of anaerobic decomposition results in the preferential conversion of organic compounds in the wastewater into methane (CH_4), carbon dioxide (CO_2), and water rather than intermediate metabolites (VOC).

The NRCS Field Office Technical Guide No. 359, Waste Treatment Lagoon, for California specifies the following criteria for anaerobic treatment lagoons:

- Required volume - the minimum design volume should account for all potential sludge, treatment, precipitation, and runoff volumes.
- Treatment period - retention time of the material in the lagoon shall be the time required to provide environmentally safe utilization of waste. The minimum hydraulic retention time for a covered lagoon in the San Joaquin Valley is about 38 days.
- Waste loading shall be based on the maximum daily loading considering all waste sources that will be treated by the lagoon. The loading rate is typically based on volatile solids (VS) loading per unit of volume. The suggested loading rate for the San Joaquin Valley is 6.5-11 lb-VS/1000 ft³/day depending on separation and type of system.
- The operating depth of the lagoon shall be 12 feet or greater. Maximizing the depth of the lagoon minimizes the surface area, which in turn minimizes the cover size and cost. Increasing the lagoon depth has the following advantages:
 - Minimizes surface area in contact with the atmosphere, thus reducing surface available to convection, evaporation
 - Smaller surface areas provide a more favorable and stable environment for methane bacteria
 - Better mixing of lagoon due to rising gas bubbles
 - Requires less land
 - More efficient for mechanical mixing

The lagoon design shall also consider location, soils and foundation, erosion, and depth to groundwater as required by the regional water control board.

The NRCS guideline suggests that this system consist of two cells, a treatment lagoon (primary lagoon) and a storage pond (secondary lagoon). The first stage of the lagoon system is the biological treatment stage and is designed with a constant liquid level to stabilize the anaerobic digestion. The effluent from the first stage overflows into a second lagoon designed for liquid storage capacity. Effluent from the second lagoon is used in the flush lanes and for the irrigation of cropland. The secondary (overflow) lagoon acts as the storage pond, which can be emptied when necessary.

A properly designed anaerobic treatment lagoon will reduce the volatile solids (VS) by at least 50%. This will reduce the biological oxygen demand (BOD) and increase the efficiency at which organic compounds are converted into methane and carbon dioxide rather than VOC. Since 50% of the VS in the liquid manure will have been removed or digested in the lagoon, there will be less VS remaining in the effluent to decompose into VOC. Although, the VS reduction will be at least 50%, a conservative control efficiency

of 40% will be applied to irrigation from a storage pond after an anaerobic treatment lagoon.

b. Step 2 - Eliminate technologically infeasible options

There are no technologically infeasible options to eliminate from step 1.

c. Step 3 - Rank remaining options by control effectiveness

The remaining options are ranked below according to their control effectiveness:

- 1) Irrigation of crops using liquid/slurry manure from an aerobic treatment lagoon or mechanically aerated lagoon (95% control efficiency)
- 2) Irrigation of crops using liquid/slurry manure from a holding/storage pond after being treated in a covered lagoon/digester (80% control efficiency)
- 3) Irrigation of crops using liquid/slurry manure from the secondary lagoon/holding/storage pond where preceded by an uncovered anaerobic treatment lagoon designed to meet Natural Resources Conservation Service (NRCS) standards (40% control efficiency)

d. Step 4 - Cost Effectiveness Analysis

Irrigation of crops using liquid/slurry manure from an aerobic treatment lagoon or mechanically aerated lagoon

The cost effectiveness analysis performed in the previous section (BACT analysis for VOC emissions from the lagoons/storage ponds) demonstrated that, based on the space requirements alone, aerobic treatment cannot reasonably be required for this project. The previous analysis also demonstrated that mechanically aerated lagoons are not cost effective. Since the emission rate from land application of manure (1.4 lb/cow-yr) is not significantly different from the emission rate from lagoons/storage ponds (1.3 lb/cow-yr), no significant change from the previous cost effectiveness determination can be expected.

Irrigation of crops using liquid/slurry manure from a holding/storage pond after being treated in a covered lagoon digester

The cost effectiveness analysis performed in the previous section (BACT analysis for VOC emissions from the lagoons/storage ponds) demonstrated that a covered lagoon digester is not cost effective. Since the emission rate from land application of manure (1.4 lb/cow-yr) is not significantly different from the emission rate from lagoons/storage ponds (1.3 lb/cow-yr), no significant change from the previous cost effectiveness determination can be expected.

Irrigation of crops using liquid/slurry manure from the secondary lagoon/holding/storage pond where preceded by an uncovered anaerobic treatment lagoon designed to meet Natural Resources Conservation Service (NRCS) standards

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

e. Step 5 - Select BACT

The applicant has proposed irrigation of crops using liquid/slurry manure from the secondary lagoon/holding/storage pond preceded by an uncovered anaerobic treatment system designed to meet Natural Resources Conservation Service (NRCS) standards. The proposal satisfies BACT for this category.

2. BACT Analysis for NH₃ Emissions from the Liquid Manure Land Application

a. Step 1 - Identify all control technologies

The following option has been identified as a possible control option for NH₃ emissions from land application of liquid manure:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

Description of Control Technology

- 1) All animals fed in accordance with NRC or other District-approved guidelines

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for ammonia emissions can be reduced by reducing the amount of undigested nitrogen compounds in the manure. The level of microbial action in the manure corresponds to the level of organic nitrogen content in the manure; the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia and VOCs.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOCs and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure, which will reduce ammonia emissions from liquid manure applied to cropland.

b. Step 2 - Eliminate technologically infeasible options

The option listed in Step 1 above is technologically feasible.

c. Step 3 - Rank remaining options by control effectiveness

The remaining option is listed below:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

e. Step 5 - Select BACT

The applicant has proposed to feed all animals in accordance with NRC or other District-approved guidelines. The proposal satisfies BACT for this category.

V. Top-Down BACT Analysis for Solid Manure Storage (N-6208-4)

NH₃ Emissions

a. Step 1 - Identify all control technologies

The following option has been identified as a possible control option for NH₃ emissions from solid manure storage:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

Description of Control Technology

- 1) All animals fed in accordance with NRC or other District-approved guidelines

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for ammonia emissions can be reduced by reducing the amount of undigested nitrogen compounds in the manure. The level of microbial action in the manure corresponds to the level of organic nitrogen content in the manure; the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia and VOCs.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOCs and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure, which will reduce ammonia emissions from liquid manure applied to cropland.

b. Step 2 - Eliminate technologically infeasible options

The option listed in Step 1 above is technologically feasible.

c. Step 3 - Rank remaining options by control effectiveness

The remaining option is listed below:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

e. Step 5 - Select BACT

The applicant has proposed to feed all animals at the dairy in accordance with NRC or other District-approved guidelines. The proposal satisfies BACT for this category.

VI. Top-Down BACT Analysis for Solid Manure Land Application (N-6208-4)

1. NH₃ Emissions

a. Step 1 - Identify all control technologies

The following options have been identified as possible controls for NH₃ emissions from land application of solid manure:

- 1) Rapid incorporation of solid manure into the soil after land application
- 2) All animals fed in accordance with National Research Council (NRC) or other District-approved guidelines

Description of Control Technology

1) Rapid incorporation of solid manure into the soil after land application

Various types of spreading techniques, such as box spreaders, flail type spreaders, side discharge spreaders, and spinner spreaders, are used to apply solid manure to cropland. Regardless of which technique is used, this practice requires the immediate incorporation of the manure into the soil, reducing emissions and surface run-off while minimizing the loss of nitrogen into the atmosphere. Based on a study by a local Valley dairy, there is a great potential of reducing emissions by incorporating slurry manure rapidly into the soil. A similar reduction may be obtained by the rapid incorporation of solid manure. This technology is expected to yield a NH₃ control efficiency ranging from 49% to upwards of 98%.²⁰

2) All animals fed in accordance with National Research Council (NRC) or other District-approved guidelines

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for ammonia emissions can be reduced by reducing the amount of undigested nitrogen compounds in the manure. The level of microbial action in the manure corresponds to the level of organic nitrogen content in the manure; the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia and VOCs.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOCs and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure, which will reduce ammonia emissions from solid manure.

²⁰ Page 81 of "Recommendations to the San Joaquin Valley Air Pollution Control Officer Regarding Best Available Control Technology for Dairies in the San Joaquin Valley" January 31, 2006 (http://www.valleyair.org/busind/pto/dpag/dpag_idx.htm).

b. Step 2 - Eliminate technologically infeasible options

The options listed in Step 1 above are both technologically feasible.

c. Step 3 - Rank remaining options by control effectiveness

- 1) Rapid incorporation of solid manure into the soil after land application
- 2) All animals fed in accordance with National Research Council (NRC) or other District-approved guidelines

d. Cost Effectiveness Analysis

Rapid incorporation of solid manure into the soil after land application

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

All animals fed in accordance with National Research Council (NRC) or other District-approved guidelines

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

e. Select BACT

The applicant has proposed to rapidly (within 24 hours) incorporate solid manure into the soil after land application to feed all animals in accordance with NRC or other District-approved guidelines. The proposal satisfies BACT for this category.

VII. Top Down BACT Analysis for the Feed Storage and Handling System – Total Mixed Ration (TMR) Feeding (N-6208-7)

1. BACT Analysis for VOC Emissions

a. Step 1 - Identify all control technologies

The following option has been identified as a possible control for VOC emissions from TMR feeding:

1) District Rule 4570 measures

Description of Control Technology

District Rule 4570 measures

District Rule 4570 requires the implementation of various management practices to reduce VOC emissions from TMR. These practices include pushing feed so that it is within three feet of feedlane fence within two hours of putting out the feed or use a feed trough or other feeding structure designed to maintain feed within reach of the animals, so the area of the feed is minimized and the feed can be consumed by the cows in a shorter time period instead of continuing to emit VOCs; beginning feeding total mixed rations within two hours of grinding and mixing rations, reducing the time that fresh feed emits VOCs; storing grain in a weatherproof storage structure or under a weatherproof covering from October through May; feeding steam-flaked, dry rolled, cracked or ground corn or other ground cereal grains; removal of uneaten wet feed from feeding areas; and preparing TMR with a minimum moisture content, which reduces VOC since most of the compounds emitted are highly soluble in water.

Feed Handling and Storage

The feed storage and handling area is used for the storage of feed ingredients and for the preparation of daily feed rations (known as 'total mixed rations', or TMR). Silage, the main ingredient in TMR, will be stored exclusively in ag bags at this facility. Only three of the ag bags, with an open end face, will be used for active feeding, and the remainder of the ag bags will remain closed. Feed amounts are extracted from the open end of the three active ag bags, as needed. Loaders are used to retrieve the required proportions of the silage from the ag bag (each open face is approximately 8 ft. by 12 ft.) and load them into a feed wagon with a built-in mixer. Once the silage and additive ingredients are thoroughly mixed, the feed wagon drives over to the cow housing areas to spread the TMR along the feed lanes. The open face of the ag bag has a much smaller exposed open area (8ft. x 12 ft.). This smaller area from the ag bag limits the exposure of the silage to atmosphere which greatly reduces emissions²¹.

²¹ The facility proposal to exclusively use ag bags, rather than silage piles, reduced VOC emissions enough to drop the project to below the CEQA significance thresholds.

b. Step 2 - Eliminate technologically infeasible options

The option identified in step 1 is technologically feasible.

c. Step 3 - Rank remaining options by control effectiveness

Only one option was previously identified in step 1:

- 1) District Rule 4570 measures

d. Step 4 - Cost Effectiveness Analysis

District Rule 4570 Measures

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

e. Step 5 - Select BACT

The applicant has proposed to implement District Rule 4570 measures. The proposal satisfies BACT for this category.

APPENDIX G

Summary of Health Risk Assessment (HRA) and Ambient Air Quality Analysis (AAQA)

San Joaquin Valley Air Pollution Control District Risk Management Review

To: Carlos Garcia – Permit Services
 From: Kyle Melching – Technical Services
 Date: April 10, 2017
 Facility Name: Trinkler Dairy
 Location: 7251 Crows Landing, Ceres
 Application #(s): N-6208-1-3, 2-3, 3-3, & 4-3
 Project #: N-1150266

A. RMR SUMMARY

RMR Summary						
Categories	Milk Parlor (Unit 1-3)	Dairy Cow Housing (Unit 2-3)	Lagoons (Unit 3-3)	Dry Manure (Unit 4-3)	Project Totals	Facility Totals
Prioritization Score	1.56	51.3	49.6	0.47	>1	>1
Acute Hazard Index	0.00	0.2	0.38 ¹	0.03	0.62 ¹	0.62 ¹
Chronic Hazard Index	0.00	0.16	0.00	0.00	0.18	0.18
Maximum Individual Cancer Risk	1.94E-06	11.0E-06	1.94E-06	N/A	13.4E-06	13.4E-06
T-BACT Required?	Yes-VOC's	See Conclusion*	Yes-VOC's	No		
Special Permit Conditions?	No	No	No	No		

*TBACT is determined on a corral by corral basis. TBACT will be addressed in the Conclusions section of this report.

¹Risk total includes the acute risk from the Dairy H₂S Calculator.

Proposed Permit Requirements

To ensure that human health risks will not exceed District allowable levels; the following shall be included as requirements for:

Unit # 3-3

1. The quarterly H₂S concentration cannot exceed 5.0 mg/L.

B. RMR REPORT

I. Project Description

Technical Services received a Risk Management Review (RMR) and Ambient Air Quality Analysis (AAQA) on October 29, 2015, for modifications to an existing dairy which will increase the total head from 3,150 to 5,175. The cow housing permit will need to be modified to account for the new freestall barns, calf housing, and the changes to the herd size. A new 72-stall rotary milking parlor will be built along with new lagoon (200 meters long X 87) meters wide to accommodate the increased amount of manure. Ammonia emissions from the dry manure storage and land applicant will also increase as a result of this project. The applicant has also stated that the two homes just to the east of the new calf barn will be worker only residences and therefore will be considered exempt from being modeled as receptors.

II. Analysis

Technical Services performed a prioritization using the District's HEARTs database. Emissions calculated using District-developed spreadsheets for dairies were input into the HEARTs database. In accordance with the District's *Risk Management Policy for Permitting New and Modified Sources* (APR 1905-1, March 2, 2001), risks from the proposed project were prioritized using the procedures in the 1990 CAPCOA Facility Prioritization Guidelines and incorporated in the District's HEART's database. The facility's prioritization score was above one; therefore, a refined health risk assessment was required and performed for each unit. The AERMOD model was used, with the parameters outlined below and meteorological data for 2009-2013 from Modesto to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP) and the Air Dispersion Modeling and Risk Tool (ADMRT) of the Hot Spots Analysis and Reporting Program Version 2 (HARP 2) to calculate the chronic and acute hazard indices and the carcinogenic risk for the project. The risk associated with the lagoons was derived using the H₂S file generator's quarterly emission files for the lagoon source. Each quarterly concentration was recorded and inputted into the Dairy H₂S Concentration Calculator to obtain the acute hazard index risk of 0.33. The H₂S risk is then added to the acute risk from the rest of the project to obtain the project acute hazard index risk of 0.62.

Post-Project Emissions (Modeled Increases)

EXPANSION	# of Cows	PM10 (lb/hr)	PM10 (lb/yr)	Ammonia (lb/hr)	Ammonia (lb/yr)
Milk	1780*	N/A	N/A	0.03	244
Barn 3	50*	N/A	N/A	N/A	N/A
Barn 4	50*	N/A	N/A	N/A	N/A
Barn 5	120*	N/A	N/A	N/A	N/A
Barn 6	0*	N/A	N/A	1.86	16,289
Barn 8	1580*	0.05	433	3.8	33,383
Calf Barn 2	300*	0.004	41	0.19	1,661
Lagoon	2,025*	N/A	N/A	1.69	14,788
Land Application	N/A	N/A	N/A	1.75	15,400
Dry Manure	N/A	N/A	N/A	0.63	5,510

*Used to calculate VOC TAC emissions

The results from the Criteria Pollutant Modeling are as follows:

PM₁₀ Pollutant Modeling Results*

Values are in $\mu\text{g}/\text{m}^3$

Category	24 Hours	Annual
Net Value	1.1	0.27
Interim Significance Level	10.4 ¹	2.08
Result	Pass	Pass

¹The District has decided on an interim basis to use a threshold for fugitive dust sources of 10.4 $\mu\text{g}/\text{m}^3$ for the 24-hour average concentration and 2.08 $\mu\text{g}/\text{m}^3$ for the Annual concentration.

H₂S Pollutant Modeling Results*

Values are in $\mu\text{g}/\text{m}^3$

Category	1 Hour
Max Quarterly Value	40.18
Interim Significance Level	42 ¹
Result	Pass

¹The California Ambient Air Quality Standard threshold for H₂S sources is 42 $\mu\text{g}/\text{m}^3$ for the 1-hour Maximum concentration.

III. Conclusions

The emissions from the proposed equipment will not cause or contribute significantly to a violation of the State and National AAQS.

Unit -1

The acute and chronic indices are below 1.0; and the maximum individual cancer risk associated with the unit is **1.94E-06**, which is greater than the 1 in a million threshold. In accordance with the District's Risk Management Policy, the unit is approved **with** Toxic Best Available Control Technology (T-BACT) for VOC's.

Unit 2-1

Barns 3 thru 6 and Calf Barn 2

The acute and chronic indices are below 1.0; and the maximum individual cancer risk associated with the corral is less than the 1 in a million threshold. In accordance with the District's Risk Management Policy, the corral is approved **without** Toxic Best Available Control Technology (T-BACT).

Barn 7

The acute and chronic indices are below 1.0; and the maximum individual cancer risk associated with the corral is **10.6E-06**, which is greater than the 1 in a million threshold. In accordance with the District's Risk Management Policy, the corral is approved **with** Toxic Best Available Control Technology (T-BACT) for VOC's.

Unit -3

The acute and chronic indices are below 1.0; and the maximum individual cancer risk associated with the unit is **1.94E-06**, which is greater than the 1 in a million threshold. In accordance with the District's Risk Management Policy, the unit is approved **with** Toxic Best Available Control Technology (T-BACT) for VOC's.

Unit -4

The acute hazard index is below 1.0; and there is no maximum individual cancer risk or chronic hazard index associated with the unit. In accordance with the District's Risk Management Policy, the unit is approved **without** Toxic Best Available Control Technology (T-BACT).

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

IV. Attachments

- A. RMR request from the project engineer
- B. Additional information from the applicant/project engineer
- C. Dairy Spreadsheets
- D. Prioritization score w toxic emissions summary
- E. Facility Summary

APPENDIX H

Stanislaus County

Use Permit No. PLN205-0019

Herd Size Allowed at the Site by Stanislaus County CUP

Number of Animals Allowed under PLN2016-0019 for Trinkler Dairy (Facility N-6208)	
Animal Type	Proposed Herd Composition
	Number of Animals
Milk Cows	3,180
Dry Cows	600
Heifers	1,395
Total	5,175



Stanislaus County

Department of Planning and
Community Development

S 5 T 5 R 9

IF NOT USED IN 18 MONTHS
THIS PERMIT SHALL BE VOID
SECTION 21.104.030

USE PERMIT

PERMIT NO. PLN2015-0019 – TRINKLER DAIRY FARMS

ZONE: A-2-40

DATE OF APPROVAL: February 16, 2017

The undersigned is hereby granted a Use Permit in accordance with the provisions of the Stanislaus County Code, Title 21, Chapter 21.96, and any amendments to the same.

NAME: Jon Rebiero, Trinkler Dairy Farms, Inc.

ADDRESS: P.O. Box 10

CITY: Ceres

ZIP CODE: 95307

PHONE NO. (209) 537-9883

USE: This is a request to increase a dairy herd size from 3,150 to 5,175 animal units, consisting of: 3,180 milk cows, 600 dry cows, and 1,395 heifers [275 (15-24 months); 520 (4-6 months); and 600 calves (0-3 months)] in the A-2-40 (General Agriculture) zoning district. Expansion will require the construction of a freestall barn, a milk parlor, a calf barn, a feed storage pad, and a waste water storage pond (lagoon).

LOCATION OF PROPERTY: 7251 Crows Landing Road, at the southwest corner of Crows Landing and W. Taylor Roads, in the Ceres area.

ASSESSOR'S PARCEL NO: 022-007-013

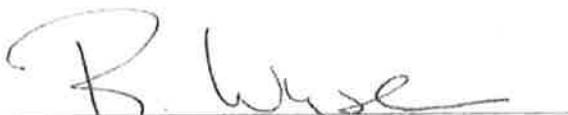
ACREAGE: 220± acre site

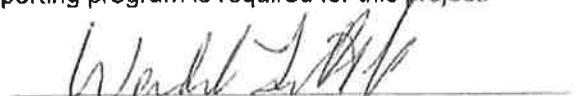
The conditions of project approval set forth herein include certain fees, dedication requirements, reservation requirements, and other exactions. Pursuant to Government Code Section 66020 (d) (1), these conditions constitute written notice of a statement of the amount of such fees, and a description of the dedications, reservations, and other exactions. You are hereby further notified that the ninety (90) day approval period in which you may protest these fees, dedications, reservations, and other exactions, pursuant to Government Code Section 66020 (a), has begun. If you fail to file a protest within this ninety (90) day period, complying with all of the requirements of Section 66020, you will be legally barred from later challenging such exactions

This permit is granted subject to Conditions of Approval (if attached). Failure to perform any of the stated conditions hereon shall constitute grounds for revocation of this permit.

I, the undersigned, do hereby certify that I have read the conditions and will comply with same in all respects.

☐ Yes ☒ No An Environmental Impact Monitoring Reporting program is required for this project.


Signature of Office Issuing Permit


Signature of Agent, Representative or Owner
3-1-17

Date Issued

As Approved by the Planning Commission
February 16, 2017

NOTE: Approval of this application is valid only if the following conditions are met. This permit shall expire unless activated within 18 months of the date of approval. In order to activate the permit, it must be signed by the applicant and one of the following actions must occur: (a) a valid building permit must be obtained to construct the necessary structures and appurtenances; or, (b) the property must be used for the purpose for which the permit is granted. (Stanislaus County Ordinance 21.104.030)

CONDITIONS OF APPROVAL

**USE PERMIT APPLICATION NO. PLN2015-0019
TRINKLER DAIRY FARMS
SCH #2015032067**

Department of Planning and Community Development

1. Use(s) shall be conducted as described in the application and supporting information (including the plot plan) as approved by the Planning Commission and/or Board of Supervisors and in accordance with other laws and ordinances.
2. Pursuant to Section 711.4 of the California Fish and Game Code (effective January 1, 2017), the applicant is required to pay a California Department of Fish and Wildlife (formerly the Department of Fish and Game) fee at the time of filing a "Notice of Determination." Within five (5) days of approval of this project by the Planning Commission or Board of Supervisors, the applicant shall submit to the Department of Planning and Community Development a check for **\$2,273.25**, made payable to **Stanislaus County**, for the payment of California Department of Fish and Wildlife and Clerk Recorder filing fees.

Pursuant to Section 711.4 (e) (3) of the California Fish and Game Code, no project shall be operative, vested, or final, nor shall local government permits for the project be valid, until the filing fees required pursuant to this section are paid.
3. Developer shall pay all Public Facilities Impact Fees and Fire Facilities Fees as adopted by Resolution of the Board of Supervisors. The fees shall be payable at the time of issuance of a building permit for any construction in the development project and shall be based on the rates in effect at the time of building permit issuance.
4. The applicant/owner is required to defend, indemnify, or hold harmless the County, its officers, and employees from any claim, action, or proceedings against the County to set aside the approval of the project which is brought within the applicable statute of limitations. The County shall promptly notify the applicant of any claim, action, or proceeding to set aside the approval and shall cooperate fully in the defense.
5. All exterior lighting shall be designed (aimed down and toward the site) to provide adequate illumination without a glare effect. This shall include, but not be limited to, the use of shielded light fixtures to prevent skyglow (light spilling into the night sky) and the installation of shielded fixtures to prevent light trespass (glare and spill light that shines onto neighboring properties).

6. The facility operator shall use best management practices for odor and vector control at all times. If the operator is unable to control flies, then the operator shall retain the services of a licensed vector control service.
7. A sign plan for all proposed on-site signs indicating the location, height, area of the sign(s), and message must be approved by the Planning Director or appointed designee(s) prior to installation.
8. The Department of Planning and Community Development shall record a Notice of Administrative Conditions and Restrictions with the County Recorder's Office within 30 days of project approval. The Notice includes: Conditions of Approval/Development Standards and Schedule; any adopted Mitigation Measures; and a project area map.
9. Should any archeological or human remains be discovered during development, work shall be immediately halted within 150 feet of the find until it can be evaluated by a qualified archaeologist. If the find is determined to be historically or culturally significant, appropriate mitigation measures to protect and preserve the resource shall be formulated and implemented. The Central California Information Center shall be notified if the find is deemed historically or culturally significant.
10. Trinkler Dairy shall implement any applicable Best Management Practices for the reduction of Greenhouse Gases from dairy operations in the event that they are adopted by the County, State or Federal government.
11. The incorporation of SJVAPCD Best Available Control Technology (BACT) including but not limited to the use of silage bags, the proposed wastewater (lagoon) pond design, and the categorization of support stock into age ranges shall be implemented as a part of this project.

Department of Public Works

12. An encroachment permit shall be taken out for any new driveway or for any work to be done in the Crows Landing Road right-of-way.
13. Crows Landing Road is classified as 135-foot six lane expressway. The required ½ width of Crows Landing Road is 67.5 feet west of the centerline of the roadway. If 67.5 feet of the road right-of-way does not exist, then the remainder 67.5 feet shall be dedicated with an Irrevocable Offer of Dedication for the parcel frontage before approval of the first building or grading permit. The Irrevocable Offer of Dedication shall start from the south corner of the property to the north edge of the driveway north of the main entrance which is approximately 1420' long.
14. No parking, loading or unloading of vehicles will be permitted within the County Road right-of-way.
15. A grading, drainage, and erosion/sediment control plan for the project site shall be submitted before any building permit for the site is issued that creates a new or bigger building footprint on this parcel. Public Works will review and approve the drainage calculations. The grading and drainage plan shall include the following information:

- A. The plan shall contain enough information to verify that all runoff will be kept from going onto adjacent properties and Stanislaus County road right-of-way.
- B. The grading drainage and erosion/sediment control plan shall comply with the current State of California National Pollutant Discharge Elimination System (NPDES) General Construction Permit.
- C. The grading, drainage, and associated work shall be accepted by Stanislaus County Public Works prior to a final inspection or occupancy, as required by the building permit.
- D. The applicant of the building permit shall pay the current Stanislaus County Public Works weighted labor rate for the plan review of the building and/or grading plan.
- E. The applicant of the building permit shall pay the current Stanislaus County Public Works weighted labor rate for all on-site inspections. The Public Works inspector shall be contacted 48 hours prior to the commencement of any grading or drainage work on-site.

Building Permits Division

- 16. Building permits, in accordance with the most current adopted California Code of Regulations - Title 24, will be required for all proposed structures.

Department of Environmental Resources – Hazardous Materials Division

- 17. The applicant shall determine, to the satisfaction of the Department of Environmental Resources (DER) that the property has been fully investigated (via Phase I study, and Phase II study if necessary) prior to the issuance of a grading permit. DER recommends research be conducted to determine if pesticides were used on the proposed development site; if confirmed, suspect site areas should be tested for organic pesticides and metals. Any discovery of underground storage tanks, former underground storage tank locations, buried chemicals, buried refuse, or contaminated soil shall be brought to the immediate attention of DER.

Turlock Irrigation District (TID)

- 18. The owner/developer must provide load information when applying for new electric service. The owner/developer must apply for a facility change for any pole or electrical facility relocation. Facility changes are performed at developer's expense.

Regional Water Quality Control Board (RWQCB)

- 19. The facility operator shall, at all times, implement and comply with all waste and nutrient management practices and waste discharge requirements as approved by the RWQCB; including future modifications to the Waste Management Plan (WMP), and Nutrient Management Plan (NMP) in accordance with RWQCB review, permitting, and approval.
- 20. This project is subject to Individual Waste Discharge Requirements as determined by RWQCB. Individual Waste Discharge Requirements will be prepared and issued by RWQCB.

21. The facility operator shall prevent infiltration and/or discharge from silage leachate, manure solids, and process wastewater, by implementing manure management and process wastewater management during dairy operation and at the time of dairy closure.
22. No construction can begin on the proposed wastewater storage pond (lagoon) until the design is approved by the RWQCB executive officer.
23. The proposed lagoon cannot be used until the CQA report has been approved.

San Joaquin Valley Air Pollution Control District (SJVAPCD)

24. The proposed project is subject to District Rule 2010 (Permits Required) and Rule 2201 (New and Modified Stationary Source Review). A change in emissions or change in method of operation/equipment, as determined during the inspection process, shall require the submittal of a new Authority to Construct Permit application.
25. All new construction requires completion of an Authority to Construct (ATC) Permit and may be subject to the following District Rules: Regulation VIII (Fugitive PM 10 Prohibitions), Rule 4102 (Nuisance), Rule 4601 (Architectural Coatings), Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations), and Rule 4550 (Conservation Management Practices). The applicant shall comply with all applicable Rules.
26. A Rule 4570 (Confined Animal Facilities) application shall be submitted to the District.
27. To reduce impacts from construction related exhaust emissions, the developer shall utilize off-road construction fleets that can achieve fleet average emissions equal to or cleaner than the Tier II emission standards, as set for in §2423 of Title 13 of the California Code of Regulations, and Part 89 of Title 40 Code of Federal Regulations. This can be achieved through any combination of uncontrolled engines and engines complying with Tier II and above engine standards.
28. To reduce potential health impacts created by toxic air contaminants (TAC) and to insure that the proposed wastewater storage pond (lagoon) passes the Ambient Air Quality Analysis (AAQA) for Hydrogen Sulfide (H₂S), the proposed lagoon shall be a minimum of 87 meters (375 feet) wide and 200 meters (500 feet) long. The lagoon shall be set back a minimum distance of 140 meters away from the northern fence line. Construction of the pond, as required, will insure that the project will be under the SJVAPCD's threshold of significance for TACs.
29. To ensure the project passes the Risk Management Review (RMR) portion of the project the two homes, located directly east of the proposed calf barn, shall only be utilized by single employees of the dairies. No families are permitted to reside in these residences.

*Please note: If Conditions of Approval/Development Standards are amended by the Planning Commission or Board of Supervisors, such amendments will be noted in the upper right-hand corner of the Conditions of Approval/Development Standards; new wording is in **bold**, and deleted wording will have a ~~line through it~~.*

APPENDIX I

Emission Calculations for N-6208-5-0 and N-6208-6-0

N-6208-5: Emergency IC Engine

Non-emergency operating schedule:	100 hours/year
Density of diesel fuel:	7.1 lb/gal
EPA F-factor (adjusted to 60°F):	9,051 dscf/MMBtu
Fuel heating value:	137,000 Btu/gal
BHP to Btu/hr conversion:	2,542.5 Btu/hp-hr
Thermal efficiency of engine:	commonly ≈ 35%
PM ₁₀ fraction of diesel exhaust:	0.96 (CARB, 1988)

Diesel-fired IC Engine Emission Factors			
	lb/hp-hr	g/hp-hr*	Source (from project N1062016)
NO _x	0.02205	10.00	Carl Moyer Program
SO _x	0.00001	0.0051	Mass Balance Equation Below
PM ₁₀	0.0011	0.50	Rule 4201 Compliance
CO	0.0067	3.04	AP-42 (10/96) Table 3.3-1
VOC	0.0025	1.14	AP-42 (10/96) Table 3.3-1

*g/hp-hr is calculated using the lb/hp-hr value multiplied by 453.6 g/lb.

$$0.0015 \%S \times \frac{7.1 \text{ lb} \cdot \text{fuel}}{\text{gallon}} \times \frac{2 \text{ lb} \cdot \text{SO}_2}{1 \text{ lb} \cdot S} \times \frac{1 \text{ gal}}{137,000 \text{ Btu}} \times \frac{1 \text{ hp input}}{0.35 \text{ hp out}} \times \frac{2,542.5 \text{ Btu}}{\text{hp} \cdot \text{hr}} \times \frac{453.6 \text{ g}}{\text{lb}} = 0.0051 \frac{\text{g} \cdot \text{SO}_x}{\text{hp} \cdot \text{hr}}$$

Annual Potential to Emit (PE)							
NO _x	10.00	(g/hp-hr) x	400	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	882 (lb/yr)
SO _x	0.0051	(g/hp-hr) x	400	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	0 (lb/yr)
PM ₁₀	0.50	(g/hp-hr) x	400	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	44 (lb/yr)
CO	3.04	(g/hp-hr) x	400	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	268 (lb/yr)
VOC	1.14	(g/hp-hr) x	400	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	101 (lb/yr)

N-6208-6: Gasoline Dispensing Operation

- This permit unit may operate 24 hours per day, 365 days per year.
- VOC is the only pollutant emitted from this operation.
- Annual throughput = 3,000 gal/year (from initial dairy farm application)

These emission factors were obtained from Appendix A - Emission Factors For Gasoline Stations published by CAPCOA Air Toxic "Hot Spots" Program in the Gasoline Service Station Industrywide Risk Assessment Guidelines dated December 1997.

8.4	lb/1,000 gal	Tank filling loss
2.1	lb/1,000 gal	Breathing loss
8.4	lb/1,000 gal	Vehicle fueling loss
0.61	lb/1,000 gal	Spillage
19.5	lb/1,000 gal	Total VOC losses

Annual Potential to Emit (PE)					
VOC	19.5	(lb/1000 gal) x	3,000	(gal/year) =	59 (lb/year)

APPENDIX J

Quarterly Net Emissions Change (QNEC)

Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

$QNEC = PE2 - PE1$, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.

PE2 = Post Project Potential to Emit for each emissions unit, lb/qtr.

PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr.

Using the values in Sections VII.C.2 and VII.C.1 in the evaluation above, quarterly PE2 and quarterly PE1 can be calculated as follows:

Example Calculation for N-6208-1 (Milking Operation)

$$\begin{aligned} PE2_{\text{quarterly}} &= PE2_{\text{annual}} \div 4 \text{ quarters/year} \\ &= 1,272 \text{ lb VOC/year} \div 4 \text{ qtr/year} \\ &= 318 \text{ lb VOC/qtr} \end{aligned}$$

$$\begin{aligned} PE1_{\text{quarterly}} &= PE1_{\text{annual}} \div 4 \text{ quarters/year} \\ &= 560 \text{ lb/year} \div 4 \text{ qtr/year} \\ &= 140 \text{ lb VOC/qtr} \end{aligned}$$

$$QNEC = PE2 - PE1$$

$$QNEC = 318 \text{ lb VOC/qtr} - 140 \text{ lb VOC/qtr}$$

$$QNEC = 178 \text{ lb VOC/qtr}$$

Milking Operation (N-6208-1)

Quarterly NEC [QNEC] N-6208-1					
	PE2 (lb/qtr)	-	PE1 (lb/qtr)	=	QNEC (lb/qtr)
NO _x	0.0	-	0.0	=	0.0
SO _x	0.0	-	0.0	=	0.0
PM ₁₀	0.0	-	0.0	=	0.0
CO	0.0	-	0.0	=	0.0
VOC	318.0	-	140.0	=	178.0

Cow Housing (N-6208-2)

Quarterly NEC [QNEC] N-6208-2					
	PE2 (lb/qtr)	-	PE1 (lb/qtr)	=	QNEC (lb/qtr)
NO _x	0.0	-	0.0	=	0.0
SO _x	0.0	-	0.0	=	0.0
PM ₁₀	1,610.0	-	3,617.75	=	-2,007.75
CO	0.0	-	0.0	=	0.0
VOC	9,295.25	-	5,376.5	=	3,918.75

Liquid Manure Handling System (N-6208-3)

Quarterly NEC [QNEC] N-6208-3					
	PE2 (lb/qtr)	-	PE1 (lb/qtr)	=	QNEC (lb/qtr)
NO _x	0.0	-	0.0	=	0.0
SO _x	0.0	-	0.0	=	0.0
PM ₁₀	0.0	-	0.0	=	0.0
CO	0.0	-	0.0	=	0.0
VOC	1,367.5	-	1,310.25	=	57.25

Solid Manure Handling System (N-6208-4)

Quarterly NEC [QNEC] N-6208-4					
	PE2 (lb/qtr)	-	PE1 (lb/qtr)	=	QNEC (lb/qtr)
NO _x	0.0	-	0.0	=	0.0
SO _x	0.0	-	0.0	=	0.0
PM ₁₀	0.0	-	0.0	=	0.0
CO	0.0	-	0.0	=	0.0
VOC	441.5	-	254.75	=	186.75

Feed Storage and Handling System (N-6208-7)

Quarterly NEC [QNEC] N-6208-7					
	PE2 (lb/qtr)	-	PE1 (lb/qtr)	=	QNEC (lb/qtr)
NO _x	0.0	-	0.0	=	0.0
SO _x	0.0	-	0.0	=	0.0
PM ₁₀	0.0	-	0.0	=	0.0
CO	0.0	-	0.0	=	0.0
VOC	9,327.75	-	9,472.5	=	-144.75