



SEP 21 2017

Arlan Vander Woude
Delta Woods Dairy
18700 S Bacchetti Rd
Tracy, CA 95304

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: N-6217
Project Number: N-1162569

Dear Mr. Vander Woude:

Enclosed for your review and comment is the District's analysis of Delta Woods Dairy's application for an Authority to Construct for the proposed expansion of an existing dairy operation, at 18700 S Bacchetti Rd in Tracy. The expansion will consist of the construction of new cow housing barns and an increase in the maximum herd capacity from 975 milk cows, not to exceed 1,120 mature cows (milk and dry), and 903 total support stock (heifers, calves, and bulls), to 2,085 milk cows, not to exceed 2,400 mature cows (milk and dry), and 50 support stock (heifers, calves, and bulls).

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. Derek Fukuda of Permit Services at (559) 230-5917.

Sincerely,



Arnaud Marjollet
Director of Permit Services

AM:df

Enclosures

cc: Tung Le, CARB (w/ enclosure) via email

Sayed Sadredin
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San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Dairy Expansion

Facility Name:	Delta Woods Dairy	Date:	August 28, 2017
Mailing Address:	18700 S Bacchetti Rd Tracy, CA 95304	Engineer:	Derek Fukuda
		Lead Engineer:	Jerry Sandhu
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Application #s:	N-6217-1-1, -2-1, -3-1, -4-1, and -5-1		
Project #:	N-1162569		
Deemed Complete:	October 20, 2016		

I. Proposal

Delta Woods Dairy has requested Authority to Construct (ATC) permits for the expansion of an existing dairy operation. The proposed expansion will affect the dairy's existing cow milking operation (unit -1), cow housing operation (unit -2), liquid manure handling operation (unit -3), solid manure handling operation (unit -4), and feed storage operation (unit -5). The Permits to Operate (PTOs) for these existing operations are included in Appendix A. The proposed modifications to these operations are detailed below:

Unit N-6217-1 (Cow Milking Operation):

- Replace existing rotary (40 stall) milking parlor with a double 30 parallel (60 stall) milking parlor.
- Increase number of milk cows from 975 to 2,085.

Unit N-6217-2 (Cow Housing Operation):

- Replace Corrals #1 and #2 (existing) with Loafing Barn #3 (new).
- Replace Corrals #3, #4, and #5 (existing) with Freestall Barn #4 (new).
- Remove Freestall Barns #2 and #3 (existing).
- Replace Freestall Barn #4 (existing) with Loafing Barn #1 (new).
- Replace Freestall Barn #5 (existing) with Loafing Barn #2/Hospital Barn (new).
- Remove Freestall Barn #6 (existing).
- Construct new Freestall Barn #2 (new).
- Construct new Freestall Barn #3 (new).
- The facility has proposed that the three new freestall barns (#2, #3, and #4) proposed to be constructed in this project be given the same name as the three existing freestall barns (#2, #3, and #4) being removed in this project.

- Increase herd size as follows:

Herd Type	Pre-Project	Post-Project
Milk Cows	975	2,085
Dry Cows	145	315
Support Stock (Heifers, Calves, and Bulls)	903	50
Total	2,023	2,450

Unit N-6217-3 (Liquid Manure Handling):

- Install one mechanical separator.
- Install one processing pit.
- Convert the two existing settling basins and larger of the two storage ponds to an anaerobic lagoon system.

Units N-6217-4 (Solid Manure Handling) and -5 (Feed Storage):

- The increase in the herd size and Total Mixed Ration (TMR) necessitates a change in the existing permit conditions.

A project site plan showing the proposed modifications is included in Appendix C.

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 (2/18/16)
 Rule 2410 Prevention of Significant Deterioration (6/16/11)
 Rule 2520 Federally Mandated Operating Permits (6/21/01)
 Rule 2550 Federally Mandated Preconstruction Review for Major Sources of Air Toxics (6/18/98)
 Rule 4001 New Source Performance Standards (4/14/99)
 Rule 4002 National Emissions Standards for Hazardous Air Pollutants (5/20/04)
 Rule 4101 Visible Emissions (2/17/05)
 Rule 4102 Nuisance (12/17/92)
 Rule 4550 Conservation Management Practices (8/19/04)
 Rule 4570 Confined Animal Facilities (10/21/10)
 CH&SC §41700 Health Risk Assessment
 CH&SC §42301.6 School Notice
 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 18700 S Bacchetti Rd in Tracy, CA. The equipment 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 Delta Woods 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 (Unit N-6217-1):

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 barn is used for milking and the associated onsite milk handling activities. The milking barn 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 barn, 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. There are several different parlor designs, including flat, parallel, herringbone, and rotary. Delta Woods

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.

Dairy currently operates a 40-stall rotary milking parlor; however, they are proposing to replace it with a 60-stall parallel milking parlor in this project.

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

Cow Housing (Unit N-6217-2):

The cows at this dairy will be housed in freestall barns or loafing barns.

In freestall, cows are grouped in large pens with free access to feed bunks, waterers, and stalls for resting. A standard barn design consists of a feed alley through the center of the barn, with a feed bunk on either side. The rest of the barn floor is divided into rows of individual resting 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 typically provided, but are not essential. Manure from barn feed lanes is typically removed by flushing with water. Manure from the exercise pen surfaces, where present, is typically removed by scraping with a box-type scraper.

A loafing barn is a housing structure consisting of a large fenced confinement area with paved feed lanes and a roof-type shade structure over the entire area. Manure from the feed lanes is removed by flushing, whereas manure from the unpaved surfaces is removed by scraping with a box-type scraper.

Detailed pre-project and post-project housing arrangements are summarized in the following tables and in Appendix G ('PM10 Mitigation Measures' sheet).

Pre-Project Housing Arrangements			
Housing Name	Type of Housing	Type of Cow*	Total # of Cows in All Housing Structures
Freestall Barn #1	Freestall	Milk	380
Freestall Barn #2	Freestall	Dry	90
Freestall Barn #3	Freestall	Milk	150
Freestall Barn #4	Freestall	Milk	145
Freestall Barn #5	Freestall	Milk	150
Freestall Barn #6	Freestall	Milk	150
Corrals #1 and #2	Open Corral	SS	450
Corrals #3 through #5	Open Corral	SS	443
Maternity Barn	Loafing Barn	Dry/SS	65
Total			2,023

* SS = Support Stock

Post-Project Housing Arrangements			
Housing Name	Type of Housing	Type of Cow*	Total # of Cows in All Housing Structures
Freestall Barn #1	Freestall	Milk	380
Freestall Barn #2 (new)	Freestall	Dry	405
Freestall Barn #3 (new)	Freestall	Milk	600
Freestall Barn #4 (new)	Freestall	Milk	600
Loafing Barn #1	Loafing Barn	Dry/SS	145
Loafing Barn #2 (new) / Hospital Barn	Loafing Barn	Milk	100
Loafing Barn #3	Loafing Barn	Milk	200
Maternity Barn	Loafing Barn	Dry/SS	65
Total			2,795

* SS = Support Stock

Liquid Manure Handling (Unit N-6217-3):

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 barn 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 proposed liquid manure handling system will consist of a processing pit and mechanical solids separator, an anaerobic treatment lagoon system, one storage pond, and land application of treated liquid manure.

Solids Separation:

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

Anaerobic Treatment Lagoon 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. 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.

Delta Woods Dairy has proposed to use a series of two settling basins and one storage pond that meet the anaerobic treatment design requirements discussed above.

The use of an anaerobic treatment lagoon is usually required to satisfy Best Available Control Technology (BACT) for VOC emissions from liquid manure storage and land application at dairies. For this project, the applicant has proposed to utilize an anaerobic treatment lagoon, which will result in potentials to emit for VOC from both the lagoon/storage pond and liquid manure land application that will not exceed 2.0 lb/day; however, the BACT threshold for VOC from both the lagoon/storage pond and liquid manure land application would have been exceeded and BACT would have been required if the anaerobic treatment lagoon had not been proposed.

Anaerobic Treatment Lagoon Design Check

A detailed anaerobic lagoon design check is shown in Appendix H, and summarized below:

Using the information from the design check in Appendix H, the volume of the anaerobic treatment lagoon is as follows:

Total Lagoon Treatment Volume		
Settling Basin 1 Treatment Volume	=	246,212 ft ³
Settling Basin 2 Treatment Volume	=	252,795 ft ³
Storage Pond 1 Treatment Volume	=	834,417 ft ³
Total Lagoon Treatment Volume	=	1,333,424 ft³

And the minimum required treatment volume is as follows:

Minimum Required Treatment Volume		
Minimum Required Treatment Volume	=	1,232,625 ft ³

As shown above, the anaerobic treatment lagoon will provide sufficient treatment volume to handle the total post-project manure throughput.

Land Application:

Liquid manure from the storage pond 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 (Unit N-6217-4):

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 (Unit N-6217-5):

Silage Piles and Commodity Barns

Dairy cattle feed consists primarily of silage, which is made from corn, wheat, alfalfa, or a variety of other feed crops. The silage is made by placing the harvested crops, chopped to desired pieces if necessary, into piles, which are then compacted with heavy equipment to remove air. The piles are then tightly covered to avoid reintroduction of air. This allows anaerobic microbes present in the crops to multiply, resulting in fermentation of the organic material in the feed. When the silage is ready, one end of the pile can be opened and the required amount of silage can be removed from that end on a daily basis.

In order to provide the right nutritional balance, silage is usually blended with other feed additives, such as oils, whey, seeds and grains, nut hulls, and various salts and minerals before it is fed to the cattle. These additives are usually stored in commodity barns to avoid exposure to weather.

Total Mixed Rations (TMR)

TMR refers to a blended mixture of silage and additives that is ready to be fed to the cattle. Most dairies prepare their TMRs in small batches using a feed wagon equipped with a mixer. The silage and additives are placed in the feed wagon in the proportions prescribed by the dietary requirements of the group of cows to be fed. These ingredients are then thoroughly mixed in the wagon and delivered to the feed bunks.

V. Equipment Listing

Pre-Project Equipment Description:

- N-6217-1-0:** 975 COW MILKING OPERATION WITH ONE ROTARY (40 STALL) MILKING PARLOR
- N-6217-2-0:** COW HOUSING - 975 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 1,120 MATURE COWS (MILK AND DRY); 903 TOTAL SUPPORT STOCK (HEIFERS, CALVES, AND BULLS); AND 7 FREESTALLS WITH FLUSH/SCRAPE SYSTEM
- N-6217-3-0:** LIQUID MANURE HANDLING SYSTEM CONSISTING OF TWO SETTLING BASINS; TWO STORAGE PONDS; MANURE IS LAND APPLIED THROUGH FLOOD IRRIGATION
- N-6217-4-0:** SOLID MANURE HANDLING CONSISTING OF OPEN MANURE STOCK PILES; SOLID MANURE APPLICATION TO LAND AND HAULED OFFSITE
- N-6217-5-0:** FEED STORAGE AND HANDLING CONSISTING OF COVERED FEED STORAGE OR COMMODITY BARN, SILAGE PILES, AG BAGS AND DRY GRAIN TANKS

Proposed ATC Equipment Descriptions:

- N-6217-1-1:** MODIFICATION OF 975 COW MILKING OPERATION WITH ONE ROTARY (40 STALL) MILKING PARLOR: REPLACE EXISTING PARLOR WITH ONE DOUBLE 30 PARALLEL (60 STALL) MILKING PARLOR AND INCREASE NUMBER OF MILK COWS FROM 975 TO 2,085
- N-6217-2-1:** MODIFICATION OF COW HOUSING - 975 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 1,120 MATURE COWS (MILK AND DRY); 903 TOTAL SUPPORT STOCK (HEIFERS, CALVES, AND BULLS); 6 FREESTALLS AND 1 MATERNITY LOAFING BARN, WITH FLUSH/SCRAPE SYSTEM: INCREASE MAXIMUM NUMBER OF COWS TO 2,085 MILK COWS NOT TO EXCEED 2,400 MATURE COWS (MILK AND DRY), AND DECREASE SUPPORT STOCK TO 50 TOTAL SUPPORT STOCK (HEIFERS, CALVES, AND BULLS); REMOVE FREESTALL BARNS #2, #3 AND #6; REPLACE FREESTALL BARN #4 WITH ONE NEW LOAFING BARN; REPLACE FREESTALL BARN #5 WITH ONE NEW LOAFING BARN; REPLACE CORRALS #1 AND #2 WITH ONE NEW LOAFING BARN; REPLACE CORRALS #3 THROUGH #5 WITH ONE NEW FREESTALL BARN; AND CONSTRUCT TWO NEW FREESTALL BARNS

Note: The pre-project number of freestall barns was corrected from 7 freestall barns to 6 freestall barns based on the pre-project site plans (see Appendix C) submitted by the applicant in this project.

Summary of Cow Housing Structures		
Pre-Project Housing	Modification	Post-Project Housing
Freestall Barn #1	No change	Freestall Barn #1 (Existing)
Freestall Barn #2	Removed	None
Freestall Barn #3		
None	New Structure	Freestall Barn #2 (New)*
Freestall Barn #4 - A	Removed and Replaced by	Loafing Barn #1 - A (New)
Freestall Barn #4 - B		Loafing Barn #1 - B (New)
Freestall Barn #5	Removed and Replaced by	Loafing Barn #2/Hospital Barn (New)
Freestall Barn #6	Removed	None
None	New Structure	Freestall Barn #3 (New)*
Corrals #1 and #2	Removed and Replaced by	Loafing Barn #3 (New)
Corrals #3 through #5	Removed and Replaced by	Freestall Barn #4 (New)*
Maternity Barn - A	No change	Maternity Barn - A (Existing)
Maternity Barn - B	No change	Maternity Barn - B (Existing)

* This is a newly constructed freestall barn. The facility has proposed that the freestall barn has the same name as an existing freestall barn that is being removed in this project.

N-6217-3-1: MODIFICATION OF LIQUID MANURE HANDLING SYSTEM CONSISTING OF TWO SETTLING BASINS; TWO STORAGE PONDS; MANURE IS LAND APPLIED THROUGH FLOOD IRRIGATION: INSTALLATION OF ONE PROCESSING PIT, ONE MECHANICAL SEPERATOR, CONVERT TWO SETTLING BASINS (828'X80'X5' (SB1) AND 828'X82'X5' (SB2)) AND ONE STORAGE POND (907'X139'X10' (WS1)) INTO ANAEROBIC TREATMENT LAGOONS, AND ALLOW INCREASE IN THROUGHPUT DUE TO HERD EXPANSION

N-6217-4-1: MODIFICATION OF SOLID MANURE HANDLING CONSISTING OF OPEN MANURE STOCK PILES; SOLID MANURE APPLICATION TO LAND AND HAULED OFFSITE: ALLOW INCREASE IN THROUGHPUT DUE TO HERD EXPANSION

N-6217-5-1: MODIFICATION OF FEED STORAGE AND HANDLING CONSISTING OF COVERED FEED STORAGE OR COMMODITY BARN, SILAGE PILES, AG BAGS AND DRY GRAIN TANKS: ALLOW INCREASE IN THROUGHPUT DUE TO HERD EXPANSION

Post-Project Equipment Description:

N-6217-1-1: 2,085 COW MILKING OPERATION WITH ONE DOUBLE 30 PARALLEL (60 STALL) MILKING PARLOR

- N-6217-2-1:** COW HOUSING – 2,085 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 2,400 MATURE COWS (MILK AND DRY); 50 TOTAL SUPPORT STOCK (HEIFERS, CALVES, AND BULLS); FOUR FREESTALL BARNS, THREE LOAFING BARNS, AND ONE MATERNITY LOAFING BARN, WITH FLUSH/SCRAPE SYSTEM
- N-6217-3-1:** LIQUID MANURE HANDLING SYSTEM CONSISTING OF PROCESSING PIT(S), MECHANICAL SEPARATOR(S), THREE ANAEROBIC TREATMENT LAGOONS (828'X80'X5' (SB1), 828'X82'X5' (SB2), 907'X139'X10' (WS1)), AND ONE STORAGE POND; MANURE IS LAND APPLIED THROUGH FLOOD IRRIGATION
- N-6217-4-1:** SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; SOLID MANURE APPLICATION TO LAND AND HAULED OFFSITE
- N-6217-5-1:** FEED STORAGE AND HANDLING CONSISTING OF COVERED FEED STORAGE OR COMMODITY BARN(S), SILAGE PILE(S), AG BAG(S) AND DRY GRAIN TANK(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 metabolism of nitrogen and sulfur compounds in manure. The quantity of these emissions depends directly on the herd size and profile.²

Various management practices are used to control emissions at this dairy. Some of these practices are discussed below:

Milking Parlor (Unit N-6217-1):

Frequent Flushing:

A flush/spray system is used to wash out the manure from the milking parlor 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.

² 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.

Cow Housing (Unit N-6217-2):

Feeding Cows in Accordance with the NRC Guidelines:

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.

Frequent Flushing:

Frequent flushing is also used for the removal of manure from the lanes and walkways in the housing barns. Frequent flushing creates a moist environment that greatly reduces or eliminates PM_{10} emissions. In addition, flush water dissolves NH_3 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.

Liquid Manure Handling (Unit N-6217-3):

Solids Separation:

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

Anaerobic Treatment Lagoon System:

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 H, 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.

Solid Manure Handling (Unit N-6217-4):

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 rapidly 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 NH₃, VOC, and other compounds onto soil particles provides an opportunity for oxidation by the action of various microorganisms the soil.³

Feed Storage and Handling (Unit N-6217-5):

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 NH₃, H₂S 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 piles will be covered with plastic tarps to minimize volatilization of pollutants from the pile surfaces.

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 lagoons/storage pond (permit unit N-6217-3), and emergency standby engine (permit unit N-6217-6) are the only sources of non-fugitive emissions.
- The conditions on the existing PTOs are based on the Rule 4570 Phase II mitigation measures originally proposed via application/project #N-1104157. The existing mitigation measures will be used in the current evaluation unless the applicant has proposed a Rule 4570 Phase II mitigation measure change. Modifications to specific measures will be made, as necessary, to accommodate New Source Review requirements from the current project.

³ 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>)

- All PM₁₀ emissions will be allocated to the cow housing permit unit (N-6217-2).
- All H₂S emissions will be allocated to the liquid manure permit unit. (N-6217-3).
- The PM₁₀ control efficiency for shade structures is from a District document titled "Dairy/Feedlot PM₁₀ Mitigation Practices and their Control Efficiencies."⁴
- The PM₁₀ emission factors are from a District document titled "Dairy and Feedlot PM₁₀ Emissions Factors,"⁵ 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."⁶ 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.⁷ 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 a 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.

B. Emission Factors

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

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

⁴ http://www.valleyair.org/busind/pto/dpag/Dairy_PM10_Control_Efficiencies.pdf

⁵ http://www.valleyair.org/busind/pto/dpag/FYI_%20Dairy_Feedlot_PM10_Emission_Factor.pdf

⁶ [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)

⁷ <http://www.arb.ca.gov/ei/areasrc/livestockemisfwp.pdf>

included in Appendix G. 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/year	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year
N-6217-1-0	0.0	0	1.1	410	0.4	133	0.0	0
N-6217-2-0	30.7	11,195	38.9	14,231	74.4	27,152	0.0	0
N-6217-3-0	0.0	0	10.0	3,671	26.7	9,736	0.8	267
N-6217-4-0	0.0	0	2.0	726	10.1	3,644	0.0	0
N-6217-5-0	0.0	0	51.9	18,974	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 G. 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/year	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year
N-6217-1-1	0.0	0	2.3	834	0.8	285	0.0	0
N-6217-2-1	9.9	3,562	65.9	24,023	136.4	49,787	0.0	0
N-6217-3-1	0.0	0	9.1	3,323	30.3	11,062	0.8	267
N-6217-4-1	0.0	0	2.9	1,093	17.5	6,389	0.0	0
N-6217-5-1	0.0	0	65.8	24,038	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 ATCs or PTOs 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. This facility does not have any ERCs. The PE values for units N-6217-1-0 through -5-0 are calculated in Appendix G. The PE for unit N-6217-6-0 is calculated in Appendix I. The SSPE1 is summarized in the table on the following page:

SSPE1 (lb/year)							
Permit unit	NO _x	SO _x	PM ₁₀	CO	VOC	NH ₃	H ₂ S
N-6217-1-0	0	0	0	0	410	133	0
N-6217-2-0	0	0	11,195	0	14,231	27,152	0
N-6217-3-0	0	0	0	0	3,671	9,736	267
N-6217-4-0	0	0	0	0	726	3,644	0
N-6217-5-0	0	0	0	0	18,974	0	0
N-6217-6-0	551	0	26	168	63	0	0
Totals	551	0	11,221	168	38,075	40,665	267

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

Pursuant to District Rule 2201, the SSPE2 is the sum of the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site. This facility does not have any ERCs. The PE values for units N-6217-1-1 through -5-1 are calculated in Appendix G. The PE for unit N-6217-6-0 is calculated in Appendix I. The SSPE2 is summarized in the following table:

SSPE2 (lb/year)							
Permit unit	NO _x	SO _x	PM ₁₀	CO	VOC	NH ₃	H ₂ S
N-6217-1-1	0	0	0	0	834	285	0
N-6217-2-1	0	0	3,652	0	24,023	49,787	0
N-6217-3-1	0	0	0	0	3,323	11,062	267
N-6217-4-1	0	0	0	0	1,093	6,389	0
N-6217-5-1	0	0	0	0	24,038	0	0
N-6217-6-0	551	0	26	168	63	0	0
Totals	551	0	3,678	168	53,374	67,523	267

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 is stored in several tarped/covered piles and/or plastic bags. One end/face of the pile/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 pile throughout the day as the feed rations for the various groups or categories of cows are prepared. A significant proportion of silage pile emissions 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 pile'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 of 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 tables on the next page:

Non-Fugitive SSPE1 (lb/year)						
Category	NO _x	SO _x	PM ₁₀	CO	VOC	H ₂ S
N-6217-3-0 - Lagoons only	0	0	0	0	1,764 ⁸	267
N-6217-6-0 - Engine	551	0	26	168	63	0
Non-Fugitive SSPE1	551	0	26	168	1,827	267

Non-Fugitive SSPE2 (lb/year)						
Category	NO _x	SO _x	PM ₁₀	CO	VOC	H ₂ S
N-6217-3-1 - Lagoons only	0	0	0	0	1,594 ⁹	267
N-6217-6-0 - Engine	551	0	26	168	63	0
Non-Fugitive SSPE2	551	0	26	168	1,657	267

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

Rule 2201 Major Source Determination						
Category	NO _x	SO _x	PM ₁₀	PM _{2.5}	CO	VOC
SSPE1 (lb/year)	551	0	26	26	168	1,827
SSPE2 (lb/year)	551	0	26	26	168	1,657
Major source threshold (lb/year)	20,000	140,000	140,000	140,000	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/year (tpy) for any regulated NSR pollutant.

⁸ From Appendix G - 'Pre-Project Potential to Emit (PE1)' sheet

⁹ From Appendix G - 'Pre-Project Potential to Emit (PE1)' sheet

The non-fugitive stationary source emissions from the preceding section have been converted into tons.¹⁰ The PSD major source determination is summarized in the following table:

PSD Major Source Determination						
Category	NO ₂	VOC	SO ₂	CO	PM	PM ₁₀
Estimated facility PE before project increase (tpy)	0.3	0.9	0.0	0.1	0.0	0.0
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 any pollutant. Therefore the facility is not an existing major source for PSD.

6. Baseline Emissions (BE)

The BE calculation (in lb/year) is performed pollutant-by-pollutant for each unit within the project to calculate the 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.

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, this project does not constitute an SB 288 major modification.

¹⁰ (lb/yr) / (2,000 lb/ton) = tons/yr (tpy).

8. Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a "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 pollutants, 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 SJV and which are emitted in this project are: (See 52.21 (b) (23) definition of significant)

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

I. Project Emissions Increase - New Major Source Determination

The post-project potentials to emit 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/year (tpy) for any regulated NSR pollutant.

The non-fugitive stationary source emissions for the units in this project (shown in 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	PM ₁₀	H ₂ S	S
Total PE from new and modified units (tpy)	0	0	0.1	0.1
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 emissions profile screen. Detailed QNEC calculations are included in Appendix G.

VIII. Compliance Determination

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 the ATCs as a mechanism to ensure compliance:

- {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]
- {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 PTO for the existing operation, and has submitted an ATC 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

The only new emission units proposed in this project are located in the facility's cow housing operation. All post-project emissions units in the facility's cow housing operation are shown in the table on the next page:

Post-Project Cow Housing Emissions Units		
Emissions Units	New Emissions Unit?	Notes
Freestall Barn #1	No	Existing Unit
Freestall Barn #2*	Yes	New Structure and no existing footprint
Loafing Barn #1 – A	No	Constructed over footprint of existing Freestall Barn #4
Loafing Barn #1 – B	No	
Loafing Barn #2/ Hospital Barn	No	Constructed over footprint of existing Freestall Barn #5
Freestall Barn #3*	Yes	New Structure and no existing footprint
Loafing Barn #3	No	Constructed over footprint of existing Corrals #1 and #2
Freestall Barn #4*	No	Constructed over footprint of existing Corrals #3 through #5
Maternity Barn - A	No	Existing Unit
Maternity Barn - B	No	Existing Unit

* This is a newly constructed freestall barn. The facility has proposed that the freestall barn has the same name as an existing freestall barn that is being removed in this project.

As previously discussed, the proposed expansion includes the construction of two new emissions units (Freestall Barns #2 and #3). As shown in the calculations in Appendix G, the PE for the new barns exceeds 2 lb/day for VOC and NH₃. BACT for new emissions units with PE > 2 lb/day is therefore triggered, as summarized below:

- Freestall Barns #2 and #3: 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.

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

$$\text{AIPE} = \text{PE}_2 - \text{HAPE}$$

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)

$$\text{HAPE} = \text{PE}_1 \times (\text{EF}_2/\text{EF}_1)$$

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

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

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

N-6217-2-1 (Cow Housing):

- Loafing Barn #3: VOC and NH₃
- Freestall Barn #4: VOC and NH₃

N-6217-3-1 (Liquid Manure Handling):

The facility's original proposal for this project did not include the installation and operation of an anaerobic digester. The anaerobic digester was proposed by the facility after BACT calculations demonstrated that BACT would be triggered for VOC for the liquid manure handling operation. The proposed installation and operation of an anaerobic digester by the facility, resulted in lower VOC emissions and BACT no longer being triggered for VOC.

- Lagoons/storage ponds: NH₃
- Land application: NH₃

N-6217-4-1 (Solid Manure Handling System):

- Storage: NH₃
- Land application: NH₃

N-6217-5-1 (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 above, this project does not constitute an SB 288 and/or Federal Major Modification for any pollutant. Therefore BACT is not triggered for any pollutant.

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 (Appendix E), BACT has been satisfied with the requirements listed in the tables below.

N-6217-2-1 (Cow Housing):

BACT Triggered For:

- Freestall Barns #2, #3, and #4 (VOC and NH₃)
- Loafing Barn #3 (VOC and NH₃)

Freestall Barns	
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 exercise pens/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 exercise pens/corrals 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; • Rule 4570 measures.
NH ₃	• 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 exercise pens/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 exercise pens/corrals 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.

Loafing Barns	
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 pens every two weeks using pull-type scraper in the morning hours except when prevented by wet conditions; and • Rule 4570 Measures.
NH ₃	• 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 ensure proper drainage; and • Scraping pens every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions.

The following conditions will be added to the ATC as a mechanism to ensure compliance with the BACT requirements:

- {modified 4486} 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 Rules 2201 and 4570].
- {modified 4489} For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall flush the lanes and walkways for the mature cows (milk and dry cows) at least four (4) times per day and flush the lanes and walkways for the remaining animals once per day. [District Rules 2201 and 4570]

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- {modified 4554} For all loafing barns, and Freestall Barns #2, #3, and #4, permittee shall implement at least one of the following mitigation measures: 1) slope the surface of the loafing barn/exercise pens 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 loafing barn/exercise pens to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape loafing barn/exercise pens sufficiently to maintain a dry surface except during periods of rainy weather. [District Rules 2201 and 4570]
- For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall scrape exercise pen/loafing barn surfaces every two weeks using a pull-type scraper during morning hours, except when prevented by wet conditions. [District Rule 2201]
- {modified 4492} For all freestall barns, permittee shall remove manure that is not dry from individual cow beds or shall rake, harrow, scrape, or grade bedding at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4499} For all loafing barns, permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4501} For all loafing barns, permittee shall clean manure from the barns at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean the barns at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
- {modified 4518} For all loafing barns, permittee shall manage the barns 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 the barns become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the barns becoming accessible. [District Rules 2201 and 4570]

Unit N-6217-3-1 (Liquid Manure Handling)

BACT Triggered For:

- Lagoons/storage ponds (NH₃)
- Land application (NH₃)

Lagoons and Storage Ponds	
NH ₃	• All animals fed in accordance with NRC or other District-approved guidelines.

Liquid Manure Land Application	
NH ₃	• All animals fed in accordance with NRC or other District-approved guidelines.

The following condition will be added to the ATC as a mechanism to ensure compliance with the BACT requirements:

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]

Unit N-6217-4-1 (Solid Manure Handling)

BACT Triggered For:

- Storage (NH₃)
- Land application (NH₃)

Solid Manure Storage and Solid Manure Land Application	
NH ₃	• All animals fed in accordance with NRC or other District-approved guidelines. • Rapid incorporation (within 2 hours) of solid manure into the soil after land application, and all animals fed in accordance with NRC or other District-approved guidelines.

The following conditions will be added to the ATC as a mechanism to ensure compliance with the BACT requirements:

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- {modified 4541} Solid manure shall be incorporated into the soil within two (2) hours of land application. [District Rules 2201 and 4570]

Unit N-6217-5-1 (Feed Storage and Handling):

BACT Triggered For:

- Total mixed ration (TMR) feeding (VOC)

Feed and Storage Handling	
VOC	• District Rule 4570 Measures.

The following conditions will be added to the ATC as a mechanism to ensure compliance with the BACT requirements:

- {modified 4454} 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]

B. Offsets

1. Offset Applicability

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.

The SSPE2 is compared to the offset thresholds in the table on the next page.

Offset Determination (lb/year)					
	NO _x	SO _x	PM ₁₀	CO	VOC
SSPE2	551	0	3,678	168	53,374
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	No	No	No	No	Yes

2. Quantity of Offsets Required

As seen above, the SSPE2 is greater than the offset thresholds for VOC. However, per Section 4.6.9 of Rule 2201, offsets are not required for agricultural operations that are not Major Sources. As indicated in Section VII.5 of this application review, this agricultural operation is not a Major Source; therefore, offsets will not be required for any criteria pollutant.

C. Public Notification

1. Applicability

Public noticing is required for:

- New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
- Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
- Any project which results in the offset thresholds being surpassed,
- Any project with an SSIPE of greater than 20,000 lb/year for any pollutant, and/or
- 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, this project does not constitute an SB 288 or Federal Major Modification; therefore, public noticing for SB 288 or Federal Major Modification purposes is not required.

b. PE > 100 lb/day

As shown in the calculations in Appendix G, 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:

Public Notice - Offset Thresholds				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold (lb/year)	Notice Required?
NO _x	551	551	20,000	No
SO _x	0	0	54,750	No
PM ₁₀	11,221	3,678	29,200	No
CO	168	168	200,000	No
VOC	38,075	53,374	20,000	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.

SSIPE Public Notice Thresholds					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO _x	551	551	0	20,000 lb/year	No
SO _x	0	0	0	20,000 lb/year	No
PM ₁₀	3,678	11,221	-7,543	20,000 lb/year	No
CO	168	168	0	20,000 lb/year	No
VOC	53,374	38,840	14,534	20,000 lb/year	No
NH ₃	67,523	40,665	26,858	20,000 lb/year	Yes

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 change is not a Title V significant modification, and therefore public noticing is not required.

2. Public Notice Action

As discussed above, public noticing is required for this project for the SSIPE exceeding 20,000 lb-NH₃/day. Therefore, 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 prior to the issuance of the ATC for this equipment.

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 based on the numbers and age categories of the cows in the permitted herd, as well as conditions enforcing BACT requirements.

Proposed Rule 2201 (DEL) Conditions:

N-6217-1 (Milking Operation):

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- {modified 4484} Permittee shall flush or hose down milk parlor immediately prior to, immediately after, or during each milking. [District Rules 2201 and 4570]

N-6217-2 (Cow Housing):

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- {modified 4486} 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 Rules 2201 and 4570]
- {modified 4489} For Freestall Barn #1, permittee shall flush or scrape freestall flush lanes at least three (3) times per day for mature cows and at least once per day for support stock. [District Rules 2201 and 4570]
- {modified 4489} For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall flush the lanes and walkways for the mature cows (milk and dry cows) at least four (4) times per day and flush the lanes and walkways for the remaining animals once per day. [District Rules 2201 and 4570]

- {modified 4508} For Loafing Barns #1 and #2, and the Maternity Loafing Barn, permittee shall flush/scrape the concrete lanes at least once every day for mature cows and every seven (7) days for support stock. [District Rules 2201 and 4570]
- {modified 4554} For all loafing barns, and Freestall Barns #2, #3, and #4, permittee shall implement at least one of the following mitigation measures: 1) slope the surface of the loafing barns/exercise pens 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 loafing barns/exercise pens to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape loafing barn/exercise pens sufficiently to maintain a dry surface except during periods of rainy weather. [District Rules 2201 and 4570]
- For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall scrape exercise pen/loafing barn surfaces every two weeks using a pull-type scraper during morning hours, except when prevented by wet conditions. [District Rule 2201]
- {modified 4492} For all freestall barns, permittee shall remove manure that is not dry from individual cow beds or shall rake, harrow, scrape, or grade bedding at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4499} For all loafing barns, permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4501} For all loafing barns, permittee shall clean manure from the barns at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean the barns at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
- {modified 4518} For all loafing barns, permittee shall manage the barns such that the manure depth does not exceed twelve (12) inches at any time or point, except for in-corrals mounding. Manure depth may exceed 12 inches when the barns become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the barns becoming accessible. [District Rules 2201 and 4570]

N-6217-3 (Liquid Manure Handling):

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]

- 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 following minimum liquid manure depths shall be retained in the lagoons at all times: Lagoon #SB1 - 5 feet; Lagoon #SB2 - 5 feet; and Lagoon #WS1 - 10 feet. [District Rules 2201 and 4570]
- {modified 4538} Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rules 2201 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]
- 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 Rules 2201 and 4570]

N-6217-4 (Solid Manure Handling):

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- {modified 4541} Solid manure shall be incorporated into the soil within two (2) hours of land application. [District Rules 2201 and 4570]
- {4526} 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]
- {4529} Within seventy two (72) hours of removal of separated solids from the drying process, permittee shall either 1) remove separated solids from the facility, or 2) 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 twenty-four (24) hours per event. [District Rule 4570]

N-6217-5 (Feed Storage and Handling):

- {modified 4454} 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]
- {modified 4468} For bagged silage/feedstuff, permittee shall utilize a sealed feed storage system (e.g., ag bag). [District Rules 2201 and 4570]
- {modified 4469} 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 Rules 2201 and 4570]
- {modified 4471} 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 Rules 2201 and 4570]
- {modified 4474} 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 Rules 2201 and 4570]

- {modified 4476} 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 Rules 2201 and 4570]
- {modified 4478} 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 uncompacted material delivered on top of the pile is no more than six (6) inches. [District Rules 2201 and 4570]
- {modified 4480} 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 Rules 2201 and 4570]

E. Compliance Assurance

1. Source Testing

No source testing is currently required for dairy operations.

2. Monitoring

No monitoring is required for this project.

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following conditions are listed on the permits in this project:

All Permit Units:

- {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]

N-6217-1 (Milking Operation):

- {modified 4485} Permittee shall provide verification that milk parlors are flushed or hosed prior to, immediately after, or during each milking. [District Rules 2201 and 4570]

N-6217-2 (Cow Housing):

- {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 4490} For all freestall barns, permittee shall keep records, or maintain an operating plan, to demonstrate the frequency at which lanes are flushed or scraped. [District Rules 2201 and 4570]
- {modified 4493} For all freestall barns, permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow beds or 2) the dates when the bedding is raked, harrowed, scraped, or graded. [District Rules 2201 and 4570]
- {modified 4500} For all loafing barns, 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 4502} For all loafing barns, permittee shall demonstrate that manure from the barns are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that the barns are cleaned at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]

- {4555} For all loafing barns, and Freestall Barns #2, #3, and #4, permittee shall either 1) maintain sufficient records to demonstrate that loafing barns/exercise pens are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours or 2) maintain records of dates loafing barns/exercise pens are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rules 2201 and 4570]
- For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall maintain sufficient records to demonstrate that exercise pens and the loafing barn are scraped every two weeks using a pull-type scraper during morning hours, except when prevented by wet conditions. [District Rule 2201]
- {modified 4556} For all loafing barns, permittee shall maintain records to demonstrate the frequency at which concrete lanes are scraped, vacuumed, or flushed. [District Rules 2201 and 4570]
- {modified 4519} For all loafing barns, permittee shall measure and document the depth of manure in the barns at least once every ninety (90) days. [District Rules 2201 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 and 4570]

N-6217-3 (Liquid Manure Handling):

- {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]
- 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 Rule 2201]
- {modified 4536} Permittee shall maintain records, such as design specifications, calculations, including Minimum Treatment Volume (MTV), Hydraulic Retention Time (HRT) demonstrating that the anaerobic treatment lagoon meets the requirements listed in the NRCS Field Office Technical Guide Code 359. [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]

N-6217-4 (Solid Manure Handling):

- {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 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]

N-6217-5 (Feed Storage and Handling):

- {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 or 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]
- {modified 4470} 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 Rules 2201 and 4570]

- {modified 4472} 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 Rules 2201 and 4570]
- {modified 4473} 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 Rules 2201 and 4570]
- {modified 4475} 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 Rules 2201 and 4570]
- {modified 4477} 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 Rules 2201 and 4570]
- {modified 4479} 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 Rules 2201 and 4570]
- {modified 4481} 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 Rules 2201 and 4570]
- {modified 4482} 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 Rules 2201 and 4570]
- {modified 4483} 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 manufacturer's instructions for application of the additive. [District Rules 2201 and 4570]

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

An AAQA is conducted for the purpose of determining whether a new or modified stationary source will cause, or worsen, the violation of an ambient air quality standard (AAQS). The District's Technical Services Division conducted the required analysis. A summary of the results is included in Appendix F of this evaluation.

Delta Woods Dairy is located in an attainment area for NO_x, CO, and SO_x. As shown in the AAQA summary, the modified operation will not cause a violation of an AAQS for NO_x, CO, or SO_x.

The facility is located in a non-attainment area for PM₁₀ (state) and PM_{2.5} (state and federal) AAQS. As shown in the AAQA summary, the modified operation will not cause a violation of an AAQS PM₁₀ or PM_{2.5}.

Rule 2410 Prevention of Significant Deterioration

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

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 2550 Federally Mandated Preconstruction Review for Major Sources of Air Toxics

The provisions of this rule only apply to applications to construct or reconstruct a major air toxics source with Authority to Construct issued on or after June 28, 1998.

Newly constructed facilities or reconstructed units or sources at existing facilities are subject to preconstruction review requirements if they have the potential to emit hazardous air pollutants (air toxics) in "major" amounts (10 tons or more of an individual pollutant or 25 tons or more of a combination of pollutants) and the new units are not already subject to a standard promulgated under Section 112(d), 112(j), or 112(h) of the Clean Air Act." Facilities or sources subject to Rule 2550 would be subject to stringent air pollution control requirements, referred to as Maximum Achievable Control Technology (MACT).

The federal Clean Air Act (Section 112(b)(1)) lists 189 substances as potential hazardous air pollutants (HAPs). The following table outlines the HAPs expected to be emitted from dairies, and their estimated emission rates, based on the best data currently available:

Hazardous Air Pollutant Emissions from Dairies		
HAP	Emission Rate lb/milk cow-year	Source
Methanol	1.35	UC Davis - <i>VOC Emission from Dairy Cows and their Excreta</i> , 2005
Carbon disulfide	0.027	Dr. Schmidt - <i>Dairy Emissions using Flux Chambers (Phase I & II)</i> , 2005
Ethylbenzene	0.003	
o-Xylene	0.005	
1,2-Dibromo-3chloropropane	0.011	
1,2,4-Trichlorobenzene	0.025	
Naphthalene	0.012	
Hexachlorobutadiene	0.012	
Formaldehyde	0.005	
Acetaldehyde	0.029	
Chloroform	0.017	California State University Fresno (CSUF) - <i>Monitoring and Modeling of ROG at California Dairies</i> , 2005
Styrene	0.01	Dr. Schmidt - <i>Dairy Emissions using Flux Chambers (Phase I & II)</i> & California State University Fresno (CSUF) - <i>Monitoring and Modeling of ROG at California Dairies</i> , 2005
Vinyl acetate ¹¹	0.08	
Toluene ¹²	0.162	
Cadmium	0.009	Air Resources Board's Profile No. 423, <i>Livestock Operations Dust</i>
Hexavalent Chromium	0.004	
Nickel	0.026	
Arsenic	0.005	
Cobalt	0.003	
Lead	0.033	
Total	1.828	

Since the proposed dairy is subject to Best Available Control Technology (BACT) emissions control requirements and Rule 4570 mitigation measures, many of the pollutants listed above are expected to be controlled significantly. However, in order to ensure that this evaluation is based on the worst-case scenario, no controls will be factored into the HAPs emissions estimates. Please note that a conclusion that MACT requirements are triggered would necessarily involve consideration of controlled emissions levels.

¹¹ 0.01 + 0.07 = 0.08 lbs/hd-yr.

¹² 0.012 + 0.15 = 0.162 lbs/hd-yr.

Based on the total emission rate shown in the preceding table, the HAPs emissions calculations for the proposed dairy are summarized in the table below:

HAPs Emissions Calculations						
Category	Number of cows		Emission Rate lb/cow-year ¹³		Emissions	
					lb/year	tons/year
Milking Cows	2,085	x	1.828	=	3,811	1.91
Dry Cows	315	x	1.123	=	354	0.18
Support Stock	50	x	0.786	=	39	0.02
Total =					4,204	2.11

As shown above, total HAPs emissions are expected to be less than 10 tons per year. The proposed facility will therefore not be a major air toxics source and the provisions of Rule 2550 are not applicable.

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60. However, no subparts of 40 CFR Part 60 apply to dairies.

Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

This rule incorporates NESHAPs from Part 61, Chapter I, Subchapter C, Title 40, CFR and the NESHAPs from Part 63, Chapter I, Subchapter C, Title 40, CFR; and applies to all sources of hazardous air pollution listed in 40 CFR Part 61 or 40 CFR Part 63. However, no subparts of 40 CFR Part 61 or 40 CFR Part 63 apply to dairies.

Rule 4101 Visible Emissions

Rule 4101 states 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, the requirements of this rule do not apply to emissions subject to or specifically exempt from Regulation VIII (Fugitive PM₁₀ Prohibitions).

Pursuant to Rule 8011, Section 4.4, on-field agricultural sources are exempt from the requirements of Regulation VIII.

¹³ The emission rate total has been adjusted for each cow category using ratios based on manure production rates.

The proposed project involves only on-field agricultural sources and is therefore exempt from the requirements of Rule 4101.

Rule 4102 Nuisance

This rule prohibits the 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 & 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 F), the total facility prioritization score including this project was greater than one. Therefore, an HRA was required to determine the short-term acute and long-term chronic exposure from this project.

The RMR summary for this project is shown below:

RMR Summary

Categories	Milk Parlor (Unit 1-1)	Cow Housing (Unit 2-1)	Lagoons & Liquid Land Application (Unit 3-1)	Solid Manure Piles & Land Application (Unit 4-1)	Feed Storage & Handling (Unit 5-1)	Project Totals	Facility Totals
Prioritization Score	0.96	29.7	51.0	0.00	N/A ³	>1.0	>1.0
Acute Hazard Index	0.00	0.16	0.00	0.00	N/A ³	0.17	0.17
Chronic Hazard Index	0.00	0.03	0.00	0.00	N/A ³	0.03	0.03
Maximum Individual Cancer Risk	1.51E-07	1.71E-06	3.51E-07	N/A ²	N/A ³	2.21E-06	2.21E-06
T-BACT Required?	No	No ¹	No	No	No		
Special Permit Requirements?	No	No	No	No	No		

¹T-BACT is determined on a corral by corral basis. T-BACT will be addressed in the Conclusions Section of this report.

²There are no Cancer RELs for any of the pollutants under analysis for this unit.

³The District does not have any approved emission factors from feed storage and handling. Therefore, no analysis was required for this unit.

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 not required for this project because the HRA indicates that the risk is not above the District's thresholds for triggering T-BACT requirements; therefore, compliance with the District's Risk Management Policy is 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 RMR Summary in Appendix F of this report, the emissions increases for this project were determined to be less than significant.

Rule 4550 Conservation Management Practices

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.

Delta Woods Dairy received District approval for its CMP plan in 2005. The proposed project does not involve any changes or modifications to the CMP plan. Continued compliance with the requirements of District Rule 4550 is expected.

Rule 4570 Confined Animal Facilities (CAF)

The purpose of this rule is to limit emissions of volatile organic compounds (VOC) from Confined Animal Facilities (CAF). The provisions of this rule shall apply to any Confined Animal Facility.

Pursuant to Section 4.0 – Exemptions, the requirements of this rule, except for the requirements of section 7.0 shall not apply to a CAF which remains at all times below all of the regulatory thresholds in Table 2. The CAF at this site exceeds the regulatory threshold for a dairy in Table 2; therefore, the CAF in this project is not exempt from the requirements of this rule.

Section 5.1 outlines the permit requirements for a CAF subject to the requirements of this rule. Section 5.1.1 requires owners/operators to obtain a Permit-to-Operate for the facility. With the submittal of this application, the facility is in compliance with this requirement.

Section 5.1.2 requires a thirty-day public noticing and commenting period shall be required for all large CAF receiving their initial Permit-to-Operate or Authority-to-Construct.

The applicant has submitted an application proposing to increase the number of milk cows from 975 to 2,085. Section 3.37 of this rule defines a large CAF as a CAF that maintains at least 1,000 milking cows; therefore, this facility is considered a large CAF and public noticing will be required. Since public noticing is required for this project, a public notice will be published in a local newspaper of general circulation prior to the issuance of these ATCs.

Sections 5.1.3 through Section 5.3 discuss the requirements for the facility's emission mitigation plan. Since the facility currently has a valid emission mitigation plan, the requirements in these sections are met.

Section 5.4 states that an owner/operator may temporarily suspend use of mitigation measure(s) provided all of the following requirements are met:

- It is determined by a licensed veterinarian, certified nutritionist, CDFA, or USDA that any mitigation measure being suspended is detrimental to animal health or necessary for the animal to molt, and a signed written copy of this determination shall be retained on-site and made available for inspection upon request.
- The owner/operator notifies the District, within forty-eight (48) hours of the determination that the mitigation measure is being temporarily suspended; the specific health condition requiring the mitigation measure to be suspended; and the duration that the measure must be suspended for animal health reasons,
- The emission mitigation measure is not suspended for longer than recommended by the licensed veterinarian or certified nutritionist for animal health reasons,
- If such a situation exists, or is expected to exist for longer than thirty (30) days, the owners/operators shall, within that thirty (30) day period, submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the mitigation measure that was suspended, and
- The APCO, ARB, and EPA approve the temporary suspension of the mitigation measure for the time period requested by the owner/operator and a signed written copy of this determination shall be retained on site.

The following condition will be included on each permit.

- {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]

Section 7.2 outlines the general records requirements for CAFs subject to section 5.0 requirements. Owner/operators shall maintain records of the following:

- Copies of all of the facility's permits;

- The number of animals of each species and production group at the facility on a quarterly basis. Examples of records that may be used include Dairy Herd Improvement Association records and animal inventories done for financial purposes; and
- Records sufficient to demonstrate compliance with all applicable mitigation measures.

The following condition will be included on the cow housing permit (N-6217-2).

- {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 and 4570]

Section 7.3 outlines the record requirements for feed and silage mitigation measures.

Section 7.4 outlines the record requirements for milking parlor mitigation measures. Owner/operators shall maintain records verifying that the milking parlor was flushed or hosed immediately prior to, immediately after, or during each milking.

Section 7.5 outlines the record requirements for freestall/corral/animal housing.

Section 7.6 outlines the record requirements for solid manure/separated solids outside of animal housing.

Section 7.7 outlines the record requirements for liquid manure.

Section 7.8 outlines the record requirements for land application of manure.

Specific recordkeeping and monitoring conditions from sections 7.3 through 7.8 are shown below under the appropriate mitigation measures.

Section 7.9 requires owner/operators of a CAF subject to the requirements of Section 5.0 to keep and maintain the required records in Sections 7.1 through 7.8.4, as applicable, for a minimum of five (5) years and the records shall be made available to the APCO and EPA upon request. The following condition will be included on each permit.

- {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. [Districts 2201 and 4570]

Section 7.10 requires specific monitoring or source testing conditions for each mitigation measure. These conditions are shown below with each mitigation measure.

The dairy has chosen the following mitigation measures. All conditions required for compliance with Rule 4570 for the mitigation measures selected by the applicant are shown below. These conditions will be included on the appropriate permits.

General Conditions

- {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]
- {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 Mitigation Measures (N-6217-5)

Feed according to National Research Council (NRC) guidelines.

- {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]

Push feed so that it is within three (3) 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.

- {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 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 Rules 2201 and 4570]

Begin feeding total mixed rations within two (2) hours of grinding and mixing rations.

- {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 or record of when feeding of total mixed rations began within two hours of grinding and mixing rations. [District Rules 2201 and 4570]

Store grain in a weatherproof storage structure or under a weatherproof covering from October through May.

- {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]

Feed steam-flaked, dry rolled, cracked or ground corn or other ground cereal grains.

- {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]

Silage

Utilize a sealed feed storage system (e.g., Ag-Bag) for bagged silage.

- {modified 4468} For bagged silage/feedstuff, permittee shall utilize a sealed feed storage system (e.g., ag bag). [District Rules 2201 and 4570]

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.

- {modified 4469} 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 Rules 2201 and 4570]

- {modified 4470} 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 Rules 2201 and 4570]

Build silage piles such that the average bulk density of silage piles 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, or 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, or incorporate the following practices when creating silage piles:

- Harvest silage crop at $\geq 65\%$ moisture for corn; and $\geq 60\%$ moisture for alfalfa/grass and other silage crops; and
- Manage silage material delivery such that no more than six (6) inches of materials are un-compacted on top of the pile.
- Incorporate the following parameters for Theoretical Length of Chop (TLC) and roller opening, as applicable, for the crop being harvested:

Crop Harvested	TLC (inches)	Roller Opening(mm)
Corn with no processing	$\leq 1/2$ in	N/A
Processed Corn <35% dry matter	$\leq 3/4$ in	1 – 4 mm
Alfalfa/Grass	≤ 1.0 in	N/A
Wheat/Cereal Grains/Other	$\leq 1/2$ in	N/A

- {modified 4471} 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 Rules 2201 and 4570]
- {modified 4472} 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 Rules 2201 and 4570]

- {modified 4473} 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 Rules 2201 and 4570]
- {modified 4474} 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 Rules 2201 and 4570]
- {modified 4475} 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 Rules 2201 and 4570]
- {modified 4476} 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 Rules 2201 and 4570]
- {modified 4477} 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 Rules 2201 and 4570]
- {modified 4478} 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 Rules 2201 and 4570]
- {modified 4479} 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 or record 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 Rules 2201 and 4570]

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 square feet.

Manage multiple uncovered silage piles such that the total exposed surface area of all silage piles is less than 4,300 square feet.

Maintain silage working face use a shaver/facer to remove silage from the silage pile.

Maintain silage working face; maintain a smooth vertical surface on the working face of the silage pile.

Silage Additives: 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.

Silage Additives: 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.

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.

- {modified 4480} 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 Rules 2201 and 4570]
- {modified 4481} 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 Rules 2201 and 4570]
- {modified 4482} For each silage pile that Option 2 (Shaver/Facer or Smooth Face) is chosen as a mitigation measure for building 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 Rules 2201 and 4570]

- {modified 4483} For each silage pile that Option 3 (Silage Additives) is chosen as a mitigation measure for building 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 manufacturer's instructions for application of the additive. [District Rules 2201 and 4570]

Milking Parlor Mitigation Measures (Unit N-6217-1)

Flush or hose milk parlor immediately prior to, immediately after, or during each milking.

- {modified 4484} Permittee shall flush or hose milk parlor immediately prior to, immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
- {modified 4485} Permittee shall provide verification that milk parlors are flushed or hosed prior to, immediately after, or during each milking. [District Rules 2201 and 4570]

Freestall Barns Mitigation Measures (Unit N-6217-2)

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.

- {modified 4486} 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 Rules 2201 and 4570]

Flush or scrape freestall lanes at least three (3) times per day. Freestall Barns #2, #3, and #4 are required to perform more frequent flushing/scraping based on BACT requirements.

- {modified 4489} For Freestall Barn #1, permittee shall flush or scrape freestall flush lanes at least three (3) times per day for mature cows and at least once per day for support stock. [District Rules 2201 and 4570]
- {modified 4489} For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall flush the lanes and walkways for the mature cows (milk and dry cows) at least four (4) times per day and flush the lanes and walkways for the remaining animals once per day. [District Rules 2201 and 4570]
- {modified 4490} For all freestall barns, permittee shall keep records, or maintain an operating plan, to demonstrate the frequency at which lanes are flushed or scraped. [District Rules 2201 and 4570]

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 beddings at least once every seven (7) days.

- {modified 4492} For all freestall barns, permittee shall remove manure that is not dry from individual cow beds or shall rake, harrow, scrape, or grade bedding at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4493} For all freestall barns, permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow beds or 2) the dates when the bedding is raked, harrowed, scraped, or graded. [District Rules 2201 and 4570]

Corral and Loafing Barns Mitigation Measures (Unit N-6217-2)

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.

- {modified 4486} 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 Rules 2201 and 4570]

Inspect water pipes and troughs and repair leaks at least once every seven (7) days.

- {modified 4499} For all loafing barns, permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rules 2201 and 4570]
- {modified 4500} For all loafing barns, 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]

Clean manure from corrals at least four (4) times per year with at least sixty (60) days between cleaning, or clean corrals at least once between April and July and at least once between September and December.

- {modified 4501} For all loafing barns, permittee shall clean manure from the barns at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean the barns at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
- {modified 4502} For all loafing barns, permittee shall demonstrate that manure from the barns are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that the barns are cleaned at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]

Scrape, vacuum or flush concrete lanes in corrals at least once every day for mature cows and every seven (7) days for support stock. Loafing Barn #3 is required to perform more frequent flushing based on BACT requirements.

- {modified 4508} For Loafing Barns #1 and #2, and the Maternity Loafing Barn, permittee shall flush/scrape the concrete lanes at least once every day for mature cows and every seven (7) days for support stock. [District Rules 2201 and 4570]
- {modified 4489} For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall flush the lanes and walkways for the mature cows (milk and dry cows) at least four (4) times per day and flush the lanes and walkways for the remaining animals once per day. [District Rules 2201 and 4570]
- {modified 4556} For all loafing barns, permittee shall maintain records to demonstrate the frequency at which concrete lanes are scraped, vacuumed, or flushed. [District Rules 2201 and 4570]

Implement one of the following three 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 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.

- {modified 4554} For all loafing barns, and Freestall Barns #2, #3, and #4, permittee shall implement at least one of the following mitigation measures: 1) slope the surface of the loafing barns/exercise pens 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 loafing barns/exercise pens to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape loafing barns/exercise pens sufficiently to maintain a dry surface except during periods of rainy weather. [District Rules 2201 and 4570]
- {modified 4555} For all loafing barns, and Freestall Barns #2, #3, and #4, permittee shall either 1) maintain sufficient records to demonstrate that loafing barns/exercise pens are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours or 2) maintain records of dates loafing barns/exercise pens are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rules 2201 and 4570]

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. The facility must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible.

- {modified 4518} For all loafing barns, permittee shall manage the barns such that the manure depth does not exceed twelve (12) inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when the barns become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the barns becoming accessible. [District Rules 2201 and 4570]
- {modified 4519} For all loafing barns, permittee shall measure and document the depth of manure in the barns at least once every ninety (90) days. [District Rules 2201 and 4570]

Land Application Mitigation Measures

Solid Manure (N-6217-4)

Incorporate all solid manure within seventy-two (72) hours of land application. The facility is required to incorporate all solid manure sooner than the rule requirement based on BACT requirements.

- {modified 4541} Permittee shall incorporate all solid manure within two (2) hours of land application. [District Rules 2201 and 4570]
- {modified 4542} Permittee shall maintain records to demonstrate that all solid manure has been incorporated within two (2) hours of land application. [District Rules 2201 and 4570]

Liquid Manure (N-6217-3)

Only apply liquid manure that has been treated with an anaerobic or aerobic treatment lagoon, aerobic lagoon, or digester system.

- 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 following minimum liquid manure depths shall be retained in the lagoons at all times: Lagoon #SB1 - 5 feet; Lagoon #SB2 - 5 feet; and Lagoon #WS1 - 10 feet. [District Rules 2201 and 4570]
- 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 Rules 2201 and 4570]

Allow liquid manure to stand in the fields for no more than twenty-four (24) hours after irrigation.

- {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]

Liquid Manure Handling Mitigation Measures (N-6217-3)

Use an anaerobic treatment lagoon designed according to NRCS Guideline NO. 359.

- 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 following minimum liquid manure depths shall be retained in the lagoons at all times: Lagoon #SB1 - 5 feet; Lagoon #SB2 - 5 feet; and Lagoon #WS1 - 10 feet. [District Rules 2201 and 4570]
- {modified 4536} Permittee shall maintain records, such as design specifications, calculations, including Minimum Treatment Volume (MTV), Hydraulic Retention Time (HRT) demonstrating that the anaerobic treatment lagoon meets the requirements listed in the NRCS Field Office Technical Guide Code 359. [District Rules 2201 and 4570]
- {modified 4537} Permittee shall test any other parameters determined necessary by the APCO, ARB, and EPA to demonstrate compliance with rule requirements as frequently as determined necessary by the APCO, ARB, and EPA. [District Rules 2201 and 4570]

Remove solids from the waste system with a solid separator system, prior to the waste entering the lagoon.

- {4538} Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rules 2201 and 4570]

Solid Manure Handling Mitigation Measures (N-6217-4)

Solid Manure

Within seventy-two (72) hours of removal from housing, the owner shall 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 twenty-four (24) hours per event.

The following conditions will be added to the ATC as a mechanism to ensure compliance with this requirement:

- {4526} 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]
- {4527} 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]
- {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 Rule 4570]

Separated Solids

Within seventy-two (72) hours of removal from housing, the owner shall remove separated solids from the facility.

- 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 twenty-four (24) hours per event.

The following conditions will be added to the ATC as a mechanism to ensure compliance with this requirement:

- {4529} Within seventy two (72) hours of removal of separated solids from the drying process, permittee shall either 1) remove separated solids from the facility, or 2) 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 twenty-four (24) hours per event. [District Rule 4570]
- {4530} Permittee shall keep records of dates when separated solids are removed from the facility or permittee shall maintain records to demonstrate that separated solids piles outside the pens are covered with a weatherproof covering from October through May. [District Rule 4570]

- {4531} Permittee shall maintain records, such as manufacturer warranties or other documentation, demonstrating that the weatherproof covering over separated solids 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]

As demonstrated above, permit conditions will be included on the permits for the operations at this site. The site is expected to be in compliance with the requirements of this rule. No further discussion is required.

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The 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; and
- 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.

Greenhouse Gas (GHG) Significance Determination

District is a Responsible Agency

It is determined that another agency has prepared an environmental review document for the project. 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), (CEQA Guidelines §15381). As a Responsible Agency, the District is limited to mitigating or avoiding impacts for which it has statutory authority. The District does not have statutory authority for regulating greenhouse gas emissions. The District has determined that the applicant is responsible for implementing greenhouse gas mitigation measures, if any, imposed by the Lead Agency.

District CEQA Findings

The County of San Joaquin (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)).

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, and there is minimal potential for public concern for this particular type of facility/operation. 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 NSR and Rule 4570 Public Noticing period, issue ATC permits N-6217-1-1, -2-1, -3-1, -4-1, and -5-1 subject to the permit conditions on the attached draft ATCs in Appendix A.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
N-6217-1-1	3020-06	Cow Milking Operation	\$116.00
N-6217-2-1	3020-06	Cow Housing	\$116.00
N-6217-3-1	3020-06	Liquid Manure Handling	\$116.00
N-6217-4-1	3020-06	Solid Manure Handling	\$116.00
N-6217-5-1	3020-06	Feed Storage and Handling	\$116.00

Appendixes

- A: Draft ATCs
- B: Current PTOs
- C: Project Site Plans
- D: BACT Guidelines
- E: BACT Analysis
- F: RMR and AAQA Summary
- G: Emissions Calculations
- H: Anaerobic Treatment Lagoon Design Check
- I: PE Calculations for Unit N-6217-6-0

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: N-6217-1-1

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: DELTA WOODS DAIRY
MAILING ADDRESS: 18700 S BACCHETTI RD
TRACY, CA 95304

LOCATION: 18700 S BACCHETTI RD
TRACY, CA 95304

EQUIPMENT DESCRIPTION:

MODIFICATION OF 975 COW MILKING OPERATION WITH ONE ROTARY (40 STALL) MILKING PARLOR: REPLACE EXISTING PARLOR WITH ONE DOUBLE 30 PARALLEL (60 STALL) MILKING PARLOR AND INCREASE NUMBER OF MILK COWS FROM 975 TO 2,085

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. {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]
4. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
5. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 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 Marjolle, Director of Permit Services

N-6217-1-1: Aug 17 2017 9:56AM - FUKUDAD : Joint Inspection NOT Required

6. Permittee shall flush or hose milk parlor immediately prior to, immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
7. Permittee shall provide verification that milk parlors are flushed or hosed prior to, immediately after, or during each milking. [District Rules 2201 and 4570]
8. 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

PERMIT NO: N-6217-2-1

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: DELTA WOODS DAIRY
MAILING ADDRESS: 18700 S BACCHETTI RD
TRACY, CA 95304

LOCATION: 18700 S BACCHETTI RD
TRACY, CA 95304

EQUIPMENT DESCRIPTION:

MODIFICATION OF COW HOUSING - 975 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 1,120 MATURE COWS (MILK AND DRY); 903 TOTAL SUPPORT STOCK (HEIFERS, CALVES, AND BULLS); 6 FREESTALLS AND 1 MATERNITY LOAFING BARN, WITH FLUSH/SCRAPE SYSTEM: INCREASE MAXIMUM NUMBER OF COWS TO 2,085 MILK COWS NOT TO EXCEED 2,400 MATURE COWS (MILK AND DRY), AND DECREASE SUPPORT STOCK TO 50 TOTAL SUPPORT STOCK (HEIFERS, CALVES, AND BULLS); REMOVE FREESTALL BARNS #2, #3 AND #6; REPLACE FREESTALL BARN #4 WITH ONE NEW LOAFING BARN; REPLACE FREESTALL BARN #5 WITH ONE NEW LOAFING BARN; REPLACE CORRALS #1 AND #2 WITH ONE NEW LOAFING BARN; REPLACE CORRALS #3 THROUGH #5 WITH ONE NEW FREESTALL BARN; AND CONSTRUCT TWO NEW FREESTALL BARNS

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. {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

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Seyed Sadredin, Executive Director, APCO

Arnaud Marjollet, Director of Permit Services

N-6217-2-1 : Aug 28 2017 8:51AM - FUKUDAD : Joint Inspection NOT Required

4. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
5. For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall scrape exercise pen/loafing barn surfaces every two weeks using a pull-type scraper during morning hours, except when prevented by wet conditions. [District Rule 2201]
6. For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall maintain sufficient records to demonstrate that exercise pens and the loafing barn are scraped every two weeks using a pull-type scraper during morning hours, except when prevented by wet conditions. [District Rule 2201]
7. 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 Rules 2201 and 4570]
8. For Freestall Barn #1, permittee shall flush or scrape freestall flush lanes at least three (3) times per day for mature cows and at least once per day for support stock [District Rules 2201 and 4570]
9. For Freestall Barns #2, #3, and #4, and Loafing Barn #3, permittee shall flush the lanes and walkways for the mature cows (milk and dry cows) at least four (4) times per day and flush the lanes and walkways for the remaining animals once per day. [District Rules 2201 and 4570]
10. For all freestall barns, permittee shall keep records, or maintain an operating plan, to demonstrate the frequency at which lanes are flushed or scraped. [District Rules 2201 and 4570]
11. For all freestall barns, permittee shall remove manure that is not dry from individual cow beds or shall rake, harrow, scrape, or grade bedding at least once every seven (7) days. [District Rules 2201 and 4570]
12. For all loafing barns, permittee shall clean manure from the barns at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean the barns at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
13. For all freestall barns, permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow beds or 2) the dates when the bedding is raked, harrowed, scraped, or graded. [District Rules 2201 and 4570]
14. For all loafing barns, permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rules 2201 and 4570]
15. For all loafing barns, 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]
16. For all loafing barns, permittee shall demonstrate that manure from the barns are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that the barns are cleaned at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
17. For Loafing Barns #1 and #2, and the maternity loafing barn, permittee shall flush/scrape the concrete lanes at least once every day for mature cows and every seven (7) days for support stock. [District Rules 2201 and 4570]
18. For all loafing barns, permittee shall maintain records to demonstrate the frequency at which concrete lanes are scraped, vacuumed, or flushed. [District Rules 2201 and 4570]
19. For all loafing barns, and Freestall Barns #2, #3, and #4, permittee shall implement at least one of the following mitigation measures: 1) slope the surface of the loafing barns/exercise pens 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 loafing barns/exercise pens to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape loafing barns/exercise pens sufficiently to maintain a dry surface except during periods of rainy weather. [District Rules 2201 and 4570]

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CONDITIONS CONTINUE ON NEXT PAGE

20. For all loafing barns, and Freestall Barns #2, #3, and #4, permittee shall either 1) maintain sufficient records to demonstrate that loafing barns/exercise pens are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours or 2) maintain records of dates loafing barns/exercise pens are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rules 2201 and 4570]
21. For all loafing barns, permittee shall manage the barns such that the manure depth does not exceed twelve (12) inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when the barns become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the barns becoming accessible. [District Rules 2201 and 4570]
22. For all loafing barns, permittee shall measure and document the depth of manure in the barns at least once every ninety (90) days. [District Rules 2201 and 4570]
23. 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]
24. 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

PERMIT NO: N-6217-3-1

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: DELTA WOODS DAIRY
MAILING ADDRESS: 18700 S BACCHETTI RD
TRACY, CA 95304

LOCATION: 18700 S BACCHETTI RD
TRACY, CA 95304

EQUIPMENT DESCRIPTION:

MODIFICATION OF LIQUID MANURE HANDLING SYSTEM CONSISTING OF TWO SETTLING BASINS; TWO STORAGE PONDS; MANURE IS LAND APPLIED THROUGH FLOOD IRRIGATION; INSTALLATION OF ONE PROCESSING PIT, ONE MECHANICAL SEPERATOR, CONVERT TWO SETTLING BASINS (828'X80'X5' (SB1) AND 828'X82'X5' (SB2)) AND ONE STORAGE POND (907'X139'X10' (WS1) INTO ANAEROBIC TREATMENT LAGOONS, AND 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. {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]
4. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
5. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 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-6217-3-1 : Aug 28 2017 8:51AM - FUKUDAD : Joint Inspection NOT Required

6. 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 following minimum liquid manure depths shall be retained in the lagoons at all times: Lagoon #SB1 - 5 feet; Lagoon #SB2 - 5 feet; and Lagoon #WS1 - 10 feet. [District Rules 2201 and 4570]
7. Permittee shall maintain records, such as design specifications, calculations, including Minimum Treatment Volume (MTV), Hydraulic Retention Time (HRT) demonstrating that the anaerobic treatment lagoon meets the requirements listed in the NRCS Field Office Technical Guide Code 359. [District Rules 2201 and 4570]
8. 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 Rules 2201 and 4570]
9. 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]
10. 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]
11. Permittee shall test any other parameters determined necessary by the APCO, ARB, and EPA to demonstrate compliance with rule requirements as frequently as determined necessary by the APCO, ARB, and EPA. [District Rules 2201 and 4570]
12. Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rules 2201 and 4570]
13. 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-6217-4-1

LEGAL OWNER OR OPERATOR: DELTA WOODS DAIRY
MAILING ADDRESS: 18700 S BACCHETTI RD
TRACY, CA 95304

LOCATION: 18700 S BACCHETTI RD
TRACY, CA 95304

EQUIPMENT DESCRIPTION:

MODIFICATION OF SOLID MANURE HANDLING CONSISTING OF OPEN 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. {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]
4. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
5. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
6. Permittee shall incorporate all solid manure within two (2) hours of land application. [District Rules 2201 and 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-6217-4-1 : Aug 17 2017 9:56AM - FUKUDAD : Joint Inspection NOT Required

7. Permittee shall maintain records to demonstrate that all solid manure has been incorporated within two (2) hours of land application. [District Rules 2201 and 4570]
8. {4526} 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]
9. {4527} 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]
10. {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 Rule 4570]
11. 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

PERMIT NO: N-6217-5-1

ISSUANCE DATE: DRAFT

LEGAL OWNER OR OPERATOR: DELTA WOODS DAIRY
MAILING ADDRESS: 18700 S BACCHETTI RD
TRACY, CA 95304

LOCATION: 18700 S BACCHETTI RD
TRACY, CA 95304

EQUIPMENT DESCRIPTION:

MODIFICATION OF FEED STORAGE AND HANDLING CONSISTING OF COVERED FEED STORAGE OR COMMODITY BARN, SILAGE PILES, AG BAGS AND DRY GRAIN TANKS: 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. {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]
4. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
5. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 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-6217-5-1 - Aug 17 2017 9:56AM - FUKUDAD - 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 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 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 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 or 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. For bagged silage/feedstuff, permittee shall utilize a sealed feed storage system (e.g., ag bag). [District Rules 2201 and 4570]
16. 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 Rules 2201 and 4570]
17. 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 Rules 2201 and 4570]
18. 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 Rules 2201 and 4570]
19. 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 Rules 2201 and 4570]

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CONDITIONS CONTINUE ON NEXT PAGE

20. 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 Rules 2201 and 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, 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 Rules 2201 and 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, records of the average percent moisture of crops harvested for silage shall be maintained. [District Rules 2201 and 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, 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 Rules 2201 and 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, 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 Rules 2201 and 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 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 Rules 2201 and 4570]
26. 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 or record 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 Rules 2201 and 4570]
27. 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 Rules 2201 and 4570]
28. 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 Rules 2201 and 4570]
29. For each silage pile that Option 2 (Shaver/Facer or Smooth Face) is chosen as a mitigation measure for building 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 Rules 2201 and 4570]
30. For each silage pile that Option 3 (Silage Additives) is chosen as a mitigation measure for building 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 manufacturer's instructions for application of the additive. [District Rules 2201 and 4570]
31. 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]

APPENDIX B

Current PTOs

San Joaquin Valley Air Pollution Control District

PERMIT UNIT: N-6217-1-0

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

975 COW MILKING OPERATION WITH ONE ROTARY (40 STALL) MILKING 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-6217-2-0

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

COW HOUSING - 975 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 1,120 MATURE COWS (MILK AND DRY); 903 TOTAL SUPPORT STOCK (HEIFERS, CALVES, AND BULLS); 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 fourteen (14) 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 clean concreted lanes such that the depth of manure does not exceed twelve (12) inches at any point or time. [District Rule 4570]
16. Permittee shall measure and document the depth of manure on the concrete lanes at least once every ninety (90) days. [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-6217-3-0

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

LIQUID MANURE HANDLING SYSTEM CONSISTING OF TWO SETTLING BASINS; TWO STORAGE PONDS; 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-6217-4-0

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

SOLID MANURE HANDLING CONSISTING OF OPEN 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-6217-5-0

EXPIRATION DATE: 12/31/2017

EQUIPMENT DESCRIPTION:

FEED STORAGE AND HANDLING CONSISTING OF COVERED FEED STORAGE OR COMMODITY BARN, SILAGE PILES, AG BAGS AND DRY GRAIN TANKS

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]

PERMIT UNIT REQUIREMENTS CONTINUE ON NEXT PAGE

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

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]
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]

PERMIT UNIT REQUIREMENTS CONTINUE ON NEXT PAGE

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

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 uncompacted material delivered on top of the pile is no more than six (6) inches. [District Rule 4570]
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 C

Project Site Plans

Delta Woods Dairy

Delta Woods Dairy Prior to Modification

Corral #2- 200
Heifers

Corral #1- 250
Heifers

Corral #3- 150
Heifers

Corral #4- 150
Heifers

Corral #5- 143
Heifers

Maternity Barn 55
Dry Cows, 10
Heifers 15-24 mos.

Freestall Barn #1
380 milk Cows

Freestall Barn #5
150 Milk Cows

Freestall Barn #6
150 Milk Cows

Freestall Barn #2
90 Dry Cows

Freestall Barn #3
150 Milk Cows

Freestall Barn #4
145 Milk Cows

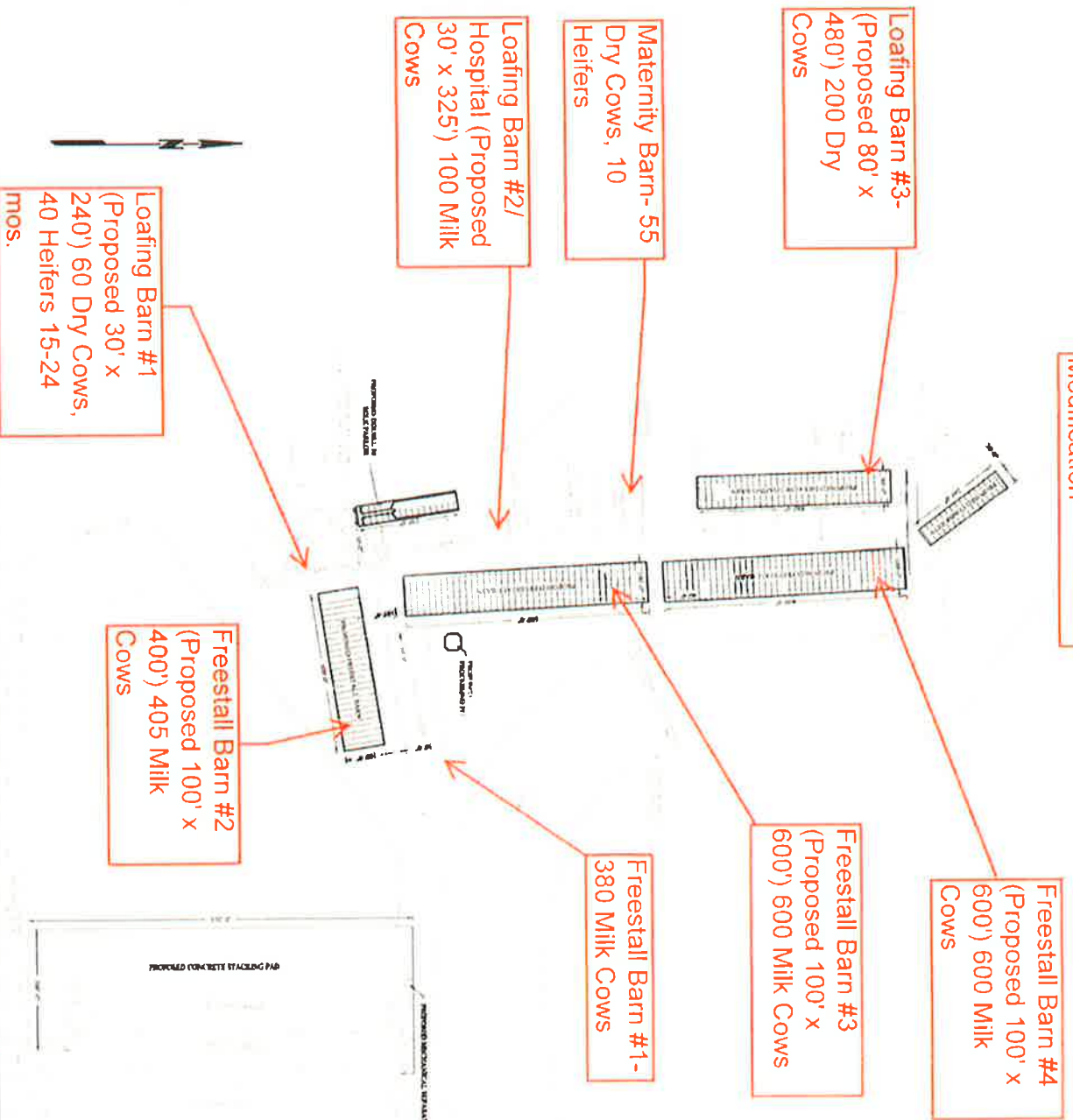
Google earth

18700 Bacchetti Rd

1000 ft



Delta Woods Dairy Post Modification



SCALE:
0 400 800
APPROXIMATE SCALE IN FEET

PROJECT NO. FRA-00

DELTA WOODS DAIRY
SAN JOAQUIN COUNTY, CA

DATE: 3/21/16

DRAWN BY: SB

APP BY: VF

FIGURE 2
SITE PLAN

APPENDIX D

BACT Guidelines

San Joaquin Valley Unified Air Pollution Control District

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

Last Update: XXXX XX, 2016

Emissions Unit: Dairy Cow Housing - Freestall Barns

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 <i>exercise pens</i>	- 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.

San Joaquin Valley Unified Air Pollution Control District

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

Last Update: XXXX XX, 2016

Emissions Unit: Dairy Cow Housing – Loafing Barns

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
PM₁₀	- Concrete feed lanes and walkways; and - Scraping of corrals every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions;		Freestall Barns for Milk and Dry Cows, Saudi Style Barns for Milk and Dry Cows
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 of corrals 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 of corrals 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.

San Joaquin Valley Unified Air Pollution Control District

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

Last Update: December 18, 2013

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**

4th Quarter 2013

San Joaquin Valley Unified Air Pollution Control District

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

Last Update: December 18, 2013

Emissions Unit: Liquid/Slurry Manure Land Application

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**

4th Quarter 2013

San Joaquin Valley Unified Air Pollution Control District

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

Last Update: December 18, 2013

Emissions Unit: Solid Manure Land Application

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	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	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.

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

4th Quarter 2013

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.

APPENDIX E

BACT Analysis

Top-Down BACT Analysis

N-6217-2 (Cow Housing)

For this project, BACT is triggered for the following emissions units in the facility's cow housing operation:

- Freestall Barns 2, 3, and 4: VOC and NH₃
- Loafing Barn 3: VOC and NH₃

The VOC and NH₃ BACT requirements are the same for freestall barns and loafing barns. The Top-Down BACT analysis for these emissions units are performed below.

I. Top-Down BACT Analysis for Freestall Barns #2, #3, and #4, and Loafing Barn #3

1. VOC Emissions

a. Step 1 - Identify all control technologies

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

- 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/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 exercise pens/corrals to ensure proper drainage;
- Scraping exercise pens/corrals 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.¹⁴ 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.

¹⁴ "Emissions of Volatile Organic Compounds Originating from UK Livestock Agriculture", Hobbs, P.J. 2004 – Journal of the Science of Food and Agriculture.

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 enteric¹⁵ and manure VOC emissions.

Properly sloping exercise pens/corrals

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

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

¹⁵ Enteric emissions are those emitted directly from the animal (primarily via belching and flatulence), due to feed digestion processes.

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed all the options listed in the previous section. 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/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 exercise pens/corrals to ensure proper drainage;
- Scraping exercise pens/corrals 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. Ammonia (NH₃) Emissions

a. Step 1 - Identify all control technologies

The following options have been identified as possible controls for NH₃ emissions from freestall barns:

- 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/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 exercise pens/corrals to ensure proper drainage; and
- Scraping exercise pens/corrals 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/corrals

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

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:

- 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/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 exercise pens/corrals to ensure proper drainage; and
- Scraping exercise pens/corrals every two weeks using a pull-type scraper in the morning hours except when prevented by wet conditions.

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed all the options listed in the previous section. 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/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 exercise pens/corrals to ensure proper drainage; and
- Scraping exercise pens/corrals 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.

N-6217-3 (Liquid Manure Handling)

For this project, BACT is triggered for the following emissions units in the facility's liquid manure handling operation:

- Lagoons/storage ponds (NH₃)
- Land application (NH₃)

The Top-Down BACT analysis for these emissions units are performed below.

I. Top-Down BACT Analysis for the Liquid Manure Handling System - Lagoons & Storage Ponds

1. NH₃ Emissions

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.

II. Top-Down BACT Analysis for the Liquid Manure Handling System – Liquid Manure Land Application

1. NH₃ Emissions

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:

- 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.

N-6217-4 (Solid Manure Handling)

For this project, BACT is triggered for the following emissions units in the facility's solid manure handling operation:

- Storage (NH₃)
- Land application (NH₃)

The Top-Down BACT analysis for these emissions units are performed below.

I. Top-Down BACT Analysis for Solid Manure Storage

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:

- 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.

II. Top-Down BACT Analysis for Solid Manure Land Application

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:

- Rapid incorporation (within 2 hours) of solid manure into the soil after land application
- 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%.¹⁶

¹⁶ 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).

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.

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.

N-6217-5 (Feed Storage and Handling)

For this project, BACT is triggered for the following emissions units in the facility's feed storage and handling operation:

- Total mixed ration (TMR) feeding (VOC)

The Top-Down BACT analysis for these emissions units are performed below.

I. Top-Down BACT Analysis for Feed Storage and Handling – Total Mixed Ration (TMR) Feeding

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:

- 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.

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 F

RMR Summary and AAQA Summary

San Joaquin Valley Air Pollution Control District

Risk Management Review

3rd REVISED MEMO

To: Derek Fukuda – Permit Services

From: Cheryl Lawler – Technical Services

Date: August 16, 2017

Facility Name: Delta Woods Dairy

Location: 18700 S. Bacchetti, Tracy

Application #(s): N-6217-1-1, 2-1, 3-1, 4-1, 5-1

Project #: N-1162569

A. RMR SUMMARY

RMR Summary							
Categories	Milk Parlor (Unit 1-1)	Cow Housing (Unit 2-1)	Lagoons & Liquid Land Application (Unit 3-1)	Solid Manure Piles & Land Application (Unit 4-1)	Feed Storage & Handling (Unit 5-1)	Project Totals	Facility Totals
Prioritization Score	0.96	29.7	51.0	0.00	N/A ³	>1.0	>1.0
Acute Hazard Index	0.00	0.16	0.00	0.00	N/A ³	0.17	0.17
Chronic Hazard Index	0.00	0.03	0.00	0.00	N/A ³	0.03	0.03
Maximum Individual Cancer Risk	1.51E-07	1.71E-06	3.51E-07	N/A ²	N/A ³	2.21E-06	2.21E-06
T-BACT Required?	No	No ¹	No	No	No		
Special Permit Requirements?	No	No	No	No	No		

¹T-BACT is determined by each individual cow housing area. T-BACT will be addressed in the Conclusions Section of this report.

²There are no Cancer RELs for any of the pollutants under analysis for this unit.

³The District does not have any approved emission factors from feed storage and handling. Therefore, no analysis was required for this unit.

B. RMR REPORT

I. Project Description

Technical Services was asked to revise and re-run an Ambient Air Quality Analysis (AAQA) and a Risk Management Review (RMR) for the modification of a dairy consisting of 2450 total dairy animals. Only the Risk Management review was re-run, because PM10 emissions rates did not change from the last AAQA performed for this project.

II. Analysis

Toxic emissions for this dairy project were calculated using emission factors derived from the District's evaluation of dairy research studies conducted by California colleges and universities. PM based toxic emissions for the cow housing were calculated using emission

factors generated from using the worst case composite of the 1997 EPA speciation of Kern County feedlot soil. Emissions were then input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, May 28, 2015), risks from the project were prioritized using the procedures in the 1990 CAPCOA Facility Prioritization Guidelines. The prioritization score for the facility was greater than 1.0 (see RMR Summary Table). Therefore, a refined health risk assessment was required. The AERMOD model was used, with the parameters outlined below and meteorological data for 2004-2008 from Tracy 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 SHARP Program, which then used 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 following parameters were used for the review:

Analysis Parameters Unit 1-1 Milk Parlor			
Source Type	Area	Location Type	Rural
Approx. Area (m²)	861.5	Release Height (m)	1
# of Cows	2,085	NH3 Emission Rates (lbs)	0.017 hr 152 yr
VOC Emission Rates (lbs)	0.05 hr 425 yr		

Analysis Parameters Unit 2-1 (Freestall Barn 1)			
Source Type	Area	Location Type	Rural
Approx. Area (m²)	2768	Release Height (m)	1
PM10 Emission Rates (lbs)	0	NH3 Emission Rates (lbs)	0
VOC Emission Rates (lbs)	0.014 hr 121 yr		

Analysis Parameters Unit 2-1 (Freestall Barn 2)			
Source Type	Area	Location Type	Rural
Approx. Area (m²)	3769	Release Height (m)	1
PM10 Emission Rates (lbs)	0.039 hr 349 yr	NH3 Emission Rates (lbs)	0.87 hr 7593 yr
VOC Emission Rates (lbs)	0.41 hr 3607 yr		

Analysis Parameters Unit 2-1 (Loafing Barn 1A & B)			
Source Type	Area	Location Type	Rural
Approx. Area (m ²)	1052	Release Height (m)	1
PM10 Emission Rates (lbs)	0.016 hr 138 yr	NH3 Emission Rates (lbs)	0
VOC Emission Rates (lbs)	0		

Analysis Parameters Unit 2-1 (Loafing Barn 2/Hospital)			
Source Type	Area	Location Type	Rural
Approx. Area (m ²)	1298	Release Height (m)	1
PM10 Emission Rates (lbs)	0.01 hr 40 yr	NH3 Emission Rates (lbs)	0
VOC Emission Rates (lbs)	0		

Analysis Parameters Unit 2-1 (Freestall Barn 3)			
Source Type	Area	Location Type	Rural
Approx. Area (m ²)	5478	Release Height (m)	1
PM10 Emission Rates (lbs)	0.056 hr 493 yr	NH3 Emission Rates (lbs)	1.09 hr 9508 yr
VOC Emission Rates (lbs)	0.53 hr 4606 yr		

Analysis Parameters Unit 2-1 (Loafing Barn 3)			
Source Type	Area	Location Type	Rural
Approx. Area (m ²)	3464	Release Height (m)	1
PM10 Emission Rates (lbs)	0	NH3 Emission Rates (lbs)	0.198 hr 1735 yr
VOC Emission Rates (lbs)	0.114 hr 100 yr		

Analysis Parameters Unit 2-1 (Freestall Barn 4)			
Source Type	Area	Location Type	Rural
Approx. Area (m ²)	5145	Release Height (m)	1
PM10 Emission Rates (lbs)	0	NH3 Emission Rates (lbs)	1.17 hr 10,224 yr
VOC Emission Rates (lbs)	0.48 hr 4185 yr		

Analysis Parameters Unit 2-1 (Maternity Barn A & B)			
Source Type	Area	Location Type	Rural
Approx. Area (m ²)	1614	Release Height (m)	1
PM10 Emission Rates (lbs)	0	NH3 Emission Rates (lbs)	0
VOC Emission Rates (lbs)	0.001 hr 12 yr		

Analysis Parameters Unit 3-1 Liquid Manure Handling			
Source Type	Area	Location Type	Rural
Lagoons Approx. Area (m ²)	27,632	Release Height (m)	0
# of Cows	2,085 ¹	Lagoons Ammonia (lbs)	0

¹Used to calculate VOC TAC emissions

Analysis Parameters Unit 4-1 Solid Manure Piles			
Source Type	Area	Location Type	Rural
Solid Manure Piles Approx. Area (m ²)	1,517.3	Release Height (m)	0
		Solid Manure Piles Ammonia (lbs)	0.31 1,249 yr

Analysis Parameters (Units 3-1 & 4-1) Land Application ¹			
Source Type	Area	Location Type	Rural
Approx. Area (m ²)	1,371,720	Release Height (m)	0
Unit 3-1 Land Application Ammonia (lb/hr)	0.413 hr 3614 yr	Unit 4-1 Land Application Ammonia (lb/yr)	0.171 hr 1497 yr

¹Ammonia emissions for both liquid manure and dry manure application was evaluated based on farmland application area. The risk from the type of land application was associated with its respective unit.

In addition to the RMR, Technical Services previously had performed modeling for the criteria pollutant PM₁₀ using AERMOD. The emission rate that was previously used was 1,130 lbs PM₁₀/year. Because PM₁₀ emissions went down as part of the revised request in December, 2016, to 1,020 lbs and was not changing as part of this 2nd revised request, the District found the AAQA to still be valid and, therefore, was not remodeled. The results from the Criteria Pollutant Modeling are as follows:

PM₁₀ Pollutant Modeling Results

Values are in µg/m³

Category	24 Hours	Annual
Net Value	7.07	1.56
Interim Significance Level	10.4 ¹	2.08 ¹
Result	Pass	Pass

¹Per District Policy 1925 the SIL threshold for fugitive dust sources is 10.4 µg/m³ for the 24-hour average concentration and 2.08 µg/m³ for the annual concentration.

III. Conclusion

Unit 1-1

The acute and chronic indices are below 1.0, and the cancer risk factor associated with the unit is less than 1.0 in a million. **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.

Unit 2-1 (All Housing Areas)

For all housing areas modeled, the acute and chronic indices are below 1.0, and the cancer risk factors associated with each housing area are less than 1.0 in a million. **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.

Unit 3-1

The acute and chronic indices are below 1.0, and the cancer risk factor associated with the unit is less than 1.0 in a million. **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.

Unit 4-1

The acute and chronic indices are below 1.0, and there is no cancer risk factor associated with any of the Toxic Air Contaminants under review. **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.

Unit 5-1

The District does not have any approved emission factors from feed storage and handling. Therefore, no analysis was required for this 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.

The ambient air quality impacts from PM₁₀ emissions at the proposed dairy modification do not exceed the District's 24-hour or Annual interim threshold for fugitive dust sources.

IV. Attachments

- A. RMR Request Form
- B. Pre and Post Housing Comparisons
- C. Prioritization
- D. SHARP RMR Risk Results
- E. Facility Summary
- F. AAQA Results

APPENDIX G

Emissions Calculations

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?
Answering "yes" assumes worst case.

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	975				975		
Dry Cows	90			55	145		
Support Stock (Heifers, Calves, and Bulls)				903	903		
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	975
Total Mature Cows	1,170
Support Stock (Heifers, Calves, and Bulls)	903
Total Calves	0
Total Dairy Head	2,023

Pre-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn	1	60	15
Alfalfa			
Wheat	1	60	15

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?
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	1,985		100		2,085		
Dry Cows			260	55	315		
Support Stock (Heifers, Calves, and Bulls)			40	10	50		
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	2,085
Total Mature Cows	2,400
Support Stock (Heifers, Calves, and Bulls)	50
Total Calves	0
Total Dairy Head	2,450

Post-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn	1	60	15
Alfalfa			
Wheat	1	60	15

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.	10%	0%
Total Control Efficiency			19%	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.	10%	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).	10%	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.	10%	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.	10%	0%
☒	☐	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.		
☒	☒	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.	10%	0%
☐	☐	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.	0%	0%
☐	☐	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			52.17%	19.00%
		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.	0%	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.	10%	0%
Total Control Efficiency			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.	10%	0%
☐	☐	Maintain lagoon pH between 6.5 and 7.5	0%	0%
Total Control Efficiency			19.00%	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.	10%	0%
☐	☐	Apply liquid/slurry manure via injection with drag hose or similar apparatus	0%	0%
Total Control Efficiency			19.00%	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%
☒	☒	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	0%	0%
☐	☐	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			0.00%	0.00%
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).	10%	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			19.00%	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.	10%	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			27.10%	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%

Post-Project PM10 Mitigation Measures

Post-Project PM10 Mitigation Measures															
Housing Name(s) or #s)	Type of Housing	Type of cow	Total # of cows in All Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/pens	Feed Young Stock Near Dusk	
1	freestall	milk cows	380	380											
2															
3															
4															
5															
6															
7															
8	loafing barn	milk cows	200	450											
9															
10	freestall	milk cows	600	600											
11															
12															
13															
14	open corral open corral	dry cows	55	65											
15		large heifers	10	65											
16															
17															
18															
19															
20															
21															
22															
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36															
37															
38															
39															
40															

Post-Project PM10 Mitigation Measures for New Housing Units at an Expanding Dairy														
Housing Name(s) or #s	Type of Housing	Type of cow	Total # of cows in All Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
1	Freestall Barn #2	milk cows	405	405								3		
2	Freestall Barn #3	milk cows	600	600								3		
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
Post-Project Total # of Cows			2,450		(The post-project total includes		1,445	dairy cows already on-site and		1005	new cows from the expansion.)			

		lb/head-yr Dairy Emissions Factors for Holstein Cows																						
		Milk Cows				Dry Cows				Medium Heifers (7 to 14 months)				Small Heifers (3 to 6 months)				Calves (0 - 3 months)						
		Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled				
Milking Parlor	VOC	NH3	<1000 milk cows	1000 milk cows	EF1	EF2	<1000 milk cows	1000 milk cows	EF1	EF2	<1000 milk cows	1000 milk cows	EF1	EF2	<1000 milk cows	1000 milk cows	EF1	EF2	<1000 milk cows	1000 milk cows	EF1	EF2		
Cow Housing	Entire Emissions in Milking Parlor	0.43	0.41	0.39	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		0.04	0.03	0.03	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		0.47	0.44	0.42	0.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		0.19	0.19	0.14	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		3.63	3.69	3.50	3.32	2.33	2.23	2.01	2.01	1.61	1.71	1.63	1.54	1.23	1.17	1.11	1.05	0.69	0.65	0.62	0.58	0.29	0.28	
	Entire Emissions in Cow Housing	10.00	6.50	4.78	5.35	5.40	3.59	2.56	2.91	4.20	2.76	2.01	2.23	2.65	1.88	1.35	1.52	1.60	1.04	0.77	0.85	0.35	0.41	
		1.05	1.00	0.85	0.81	0.57	0.54	0.44	0.44	0.42	0.36	0.34	0.30	0.26	0.24	0.23	0.17	0.16	0.14	0.13	0.08	0.06	0.05	
		0.84	0.80	0.65	0.65	0.45	0.44	0.37	0.35	0.35	0.35	0.33	0.29	0.27	0.24	0.23	0.19	0.18	0.13	0.11	0.10	0.06	0.05	
		15.78	12.09	9.91	10.13	8.75	6.90	5.51	5.71	8.81	5.22	4.38	4.38	4.62	3.56	2.91	2.99	2.99	1.98	1.63	1.66	1.22	0.95	
		41.90	41.90	15.08	15.08	21.20	21.20	7.63	7.63	11.00	11.00	3.96	3.96	7.90	7.90	2.84	2.84	6.00	6.00	2.16	2.16	1.80	1.80	
Liquid Manure Land Application	6.30	3.07	2.37	2.37	3.20	3.20	1.20	1.20	1.70	1.70	0.64	0.64	1.20	1.20	0.45	0.45	0.90	0.90	0.34	0.34	0.30	0.30		
	5.10	5.10	3.67	3.67	2.60	2.60	1.87	1.87	1.30	1.30	0.94	0.94	1.00	1.00	0.72	0.72	0.70	0.70	0.50	0.50	0.20	0.20		
	53.30	53.30	21.13	21.13	27.00	27.00	10.71	10.71	14.00	14.00	5.54	5.54	10.10	10.10	4.02	4.02	7.60	7.60	3.00	3.00	2.30	2.30		
	1.52	1.30	1.22	0.70	0.62	0.71	0.66	0.38	0.64	0.54	0.52	0.29	0.43	0.37	0.35	0.20	0.20	0.24	0.21	0.20	0.11	0.10		
	1.64	1.40	1.33	0.76	0.69	0.76	0.72	0.41	0.69	0.58	0.56	0.32	0.47	0.40	0.38	0.22	0.26	0.22	0.21	0.12	0.11	0.10		
Liquid Manure Handling	3.16	2.70	2.56	1.46	1.71	1.47	1.38	0.79	1.33	1.13	1.08	0.61	0.90	0.77	0.73	0.42	0.51	0.43	0.41	0.23	0.24	0.21	0.11	
	8.20	8.20	1.16	1.18	4.20	4.20	0.60	0.60	2.20	2.20	0.32	0.32	1.50	1.50	0.22	0.22	1.20	1.20	0.17	0.17	0.35	0.35		
	8.90	8.90	6.41	3.72	4.50	4.50	3.24	1.89	2.30	2.30	1.66	0.96	1.70	1.70	1.22	0.71	1.30	1.30	0.94	0.54	0.37	0.37		
	17.10	17.10	7.59	4.90	8.70	8.70	3.84	2.48	4.50	4.50	1.97	1.26	3.20	3.20	1.44	0.93	2.50	2.50	1.11	0.72	0.72	0.72		
	0.16	0.15	0.13	0.12	0.09	0.08	0.07	0.07	0.07	0.06	0.05	0.05	0.04	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01		
Solid Manure Handling	0.06	0.06	0.06	0.06	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	
	0.36	0.33	0.32	0.30	0.21	0.18	0.17	0.16	0.16	0.14	0.13	0.12	0.11	0.09	0.08	0.06	0.05	0.05	0.05	0.03	0.03	0.02	0.02	
	0.61	0.54	0.51	0.48	0.33	0.29	0.27	0.25	0.26	0.23	0.21	0.17	0.14	0.14	0.10	0.09	0.08	0.05	0.05	0.05	0.04	0.04		
	0.65	0.65	0.55	0.48	0.48	0.48	0.48	0.48	0.48	0.25	0.25	0.25	0.15	0.18	0.18	0.13	0.13	0.13	0.13	0.13	0.13	0.13		
	2.09	2.09	1.50	1.50	1.06	1.06	0.76	0.76	0.65	0.65	0.40	0.40	0.39	0.39	0.28	0.28	0.30	0.30	0.22	0.22	0.09	0.09		
Solid Manure Application	3.42	2.83	2.83	1.73	1.73	1.73	1.43	0.90	0.90	0.90	0.75	0.75	0.64	0.64	0.53	0.53	0.46	0.46	0.40	0.40	0.15	0.15		
	2.92	2.42	2.42	1.35	1.35	1.35	1.04	0.60	0.60	0.60	0.51	0.51	0.42	0.42	0.32	0.32	0.25	0.25	0.20	0.20	0.08	0.08		
	1.64	1.40	1.33	0.76	0.69	0.76	0.72	0.41	0.69	0.58	0.56	0.32	0.47	0.40	0.38	0.22	0.26	0.22	0.21	0.12	0.11	0.10		
	0.68	0.58	0.56	0.34	0.30	0.28	0.26	0.24	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.09	0.08	0.07	0.06	0.05	0.04		
	0.63	0.53	0.51	0.30	0.27	0.25	0.23	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.09	0.08	0.06	0.05	0.04	0.04	0.03	0.03		

Silage and TMR (Total Mixed Ration) Emissions (µg/m ² -min)			
Silage Type	Uncontrolled		EF2
	EF1	EF2	
Corn Silage	34,681	21,155	21,155
Alfalfa Silage	17,458	10,649	10,649
Wheat Silage	43,844	26,745	26,745
TMR	13,056	9,518	10,575

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

PM ₁₀ Emission Factors (lb/head-yr)			Source
Type of Cow	Dairy EF		
Cows in Freestalls	1.37		Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy
Mix/Dry in Corral	5.46		Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy
Heifers/Bulls in Open Corral	10.55		Based on a USDA/UC Davis report quantifying dairy and feedlot emissions in Tulare & Kern Counties (April '01)
Calves Under 3 mos in open corral	1.37		SJVAPCD
Calves on-ground hutches	0.343		SJVAPCD
Calves above-ground hutches	0.069		SJVAPCD
Calves above-ground hutches	0.206		SJVAPCD

The controlled PM₁₀ EF 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.

		lb/d-hr Dairy Emissions Factors for Jersey Cows:															
		Milking Parlors				Dry Cows				Large Heifers (15 to 24 months)				Small Heifers (3 to 6 months)			
		Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled		Uncontrolled		Controlled	
		<1000 milks cows	1000 milks cows	EF1	EF2	<1000 milks cows	1000 milks cows	EF1	EF2	<1000 milks cows	1000 milks cows	EF1	EF2	<1000 milks cows	1000 milks cows	EF1	EF2
Milking Parlor	VOC	0.31	0.29	0.28	0.26	-	-	-	-	-	-	-	-	-	-	-	-
	NH3	0.03	0.02	0.02	0.02	-	-	-	-	-	-	-	-	-	-	-	-
	Total	0.34	0.31	0.30	0.28	-	-	-	-	-	-	-	-	-	-	-	-
Cow Housing	VOC	7.10	4.69	3.40	3.83	2.56	1.83	2.07	2.98	1.96	1.43	1.59	2.02	1.33	0.97	1.08	1.14
	NH3	0.75	0.71	0.60	0.56	0.40	0.39	0.31	0.31	0.30	0.25	0.24	0.21	0.20	0.16	0.12	0.11
	Total	11.20	8.58	6.97	7.19	6.31	4.53	3.91	4.06	4.53	3.71	3.64	3.11	2.28	2.53	2.06	2.12
Liquid Manure Handling	VOC	1.08	0.92	0.87	0.50	0.59	0.50	0.47	0.27	0.45	0.39	0.37	0.21	0.31	0.26	0.25	0.14
	NH3	2.97	2.97	10.71	10.71	15.09	15.09	5.42	5.42	7.81	7.81	2.81	2.81	5.61	5.61	2.02	2.02
	Total	4.07	4.47	11.68	11.68	20.68	20.68	10.89	10.89	15.62	15.62	10.62	10.62	11.22	11.22	4.04	4.04
Feed Storage and Handling	VOC	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	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
	Total	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Solid Manure Handling	VOC	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	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
	Total	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08

		lb/d-hr Dairy Emissions Factors (lb/d-hr)			
		Uncontrolled		Controlled	
		EF1	EF2	EF1	EF2
Feed Storage and Handling	VOC	0.04	0.04	0.04	0.04
	NH3	0.04	0.04	0.04	0.04
	Total	0.08	0.08	0.08	0.08

		lb/d-hr Dairy Emissions Factors (lb/d-hr)			
		Uncontrolled		Controlled	
		EF1	EF2	EF1	EF2
Feed Storage and Handling	VOC	0.04	0.04	0.04	0.04
	NH3	0.04	0.04	0.04	0.04
	Total	0.08	0.08	0.08	0.08

The controlled PM10 EF 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 Potential to Emit - Cow Housing

Pre-Project Potential to Emit - Cow Housing												
	Housing Name(s) or #s	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
1	Freestall Barn #1	milk cows	380	9.81	21.13	1.37	10.2	3,728	22.0	8,029	1.4	521
2	Freestall Barn #2	dry cows	90	5.51	10.71	1.37	1.4	496	2.6	964	0.3	123
3	Freestall Barn #3	milk cows	150	9.81	21.13	1.37	4.0	1,472	8.7	3,169	0.6	206
4	Freestall Barn #4 - A	milk cows	70	9.81	21.13	1.37	1.9	687	4.1	1,479	0.3	96
5	Freestall Barn #4 - B	milk cows	75	9.81	21.13	1.37	2.0	736	4.3	1,585	0.3	103
6	Freestall Barn #5	milk cows	150	9.81	21.13	1.37	4.0	1,472	8.7	3,169	0.6	206
7	Freestall Barn #6	milk cows	150	9.81	21.13	1.37	4.0	1,472	8.7	3,169	0.6	206
8	Corral #1 and #2	support stock	450	4.28	5.54	10.55	5.3	1,926	6.8	2,491	13.0	4,748
9												
10												
11	Corral #3 - #5	large heifers	443	4.28	5.54	10.55	5.2	1,896	6.7	2,453	12.8	4,674
12												
13												
14	Maternity Barn - A	dry cows	55	5.51	10.71	4.09	0.8	303	1.6	589	0.6	225
15	Maternity Barn - B	large heifers	10	4.28	5.54	8.71	0.1	43	0.2	55	0.2	87
16												
17												
18												
19												
20												
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33												
34												
35												
36												
37												
38												
39												
40												
	Pre-Project Total # of Cows		2,023				38.9	14,231	74.4	27,152	30.7	11,195

Pre-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
2,023	38.9	14,231	74.4	27,152	30.7	11,195

Calculations:

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

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

Post-Project Potential to Emit - Cow Housing

Post-Project Potential to Emit - Cow Housing												
	Housing Name(s) or #s)	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
1	Freestall Barn #1	milk cows	380	10.13	21.13	1.17	10.5	3,849	22.0	8,029	1.2	443
2												
3												
4	Loafing Barn #1 - A	dry cows	60	5.71	10.71	2.46	0.9	343	1.8	643	0.4	147
5	Loafing Barn #1 - B	large heifers	40	4.38	5.54	4.75	0.5	175	0.6	221	0.5	190
6	Loafing Barn #2 / hospital	milk cows	100	10.13	21.13	2.46	2.8	1,013	5.8	2,113	0.7	246
7												
8	Loafing Barn #3	milk cows	200	10.13	21.13	2.46	5.6	2,026	11.6	4,226	1.3	491
9												
10												
11	Freestall Barn #4	milk cows	600	10.13	21.13	1.17	16.7	6,078	34.7	12,677	1.9	699
12												
13												
14	Maternity Barn - A	dry cows	55	5.71	10.71	3.48	0.9	314	1.6	589	0.5	191
15	Maternity Barn - B	large heifers	10	4.38	5.54	7.40	0.1	44	0.2	55	0.2	74
16												
17												
18												
19												
20												
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38												
39												
40												
Post-Project # of Cows (non-expansion)			1,445				38.0	13,842	78.3	28,553	6.7	2,481

Post-Project Potential to Emit - Cow Housing: New Freestalls at Existing Dairy												
	Housing Name(s) or #s	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
1	Freestall Barn #2	milk cows	405	10.13	21.13	1.17	11.2	4,103	23.4	8,557	1.3	472
2	Freestall Barn #3	milk cows	600	10.13	21.13	1.17	16.7	6,078	34.7	12,677	1.9	699
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
Total # of Cows From Expansion			1,005				27.9	10,181	58.1	21,234	3.2	1,171

Post-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
2,450	65.9	24,023	136.4	49,787	9.9	3,652

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	975	0	0	0	975	
Dry Cows	90	0	0	55	145	
Support Stock (Heifers, Calves and Bulls)	0	0	0	903	903	
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	
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped
Calves	0	0	0	0	0	0
Total # of Calves						

Silage Information				
Feed Type	Maximum # Open Piles	Maximum Height (ft)	Maximum Width (ft)	Open Face Area (ft ²)
Corn	1	60	15	840
Alfalfa	0	0	0	0
Wheat	1	60	15	840

Milking Parlor				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	1.1	410	0.4	133

Cow Housing						
Cow	VOC		NH3		PM10	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Total	38.9	14,231	74.4	27,152	30.7	11,195

Liquid Manure Handling						
Cow	VOC		NH3		H2S*	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	6.8	2,496	20.3	7,400	0.7	246
Dry Cows	0.5	200	1.5	557	0.1	19
Support Stock (Heifers, Calves and Bulls)	2.7	975	4.9	1,779	0	2
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	0
Calves	0.0	0	0.0	0	0	0
Bulls	0.0	0	0.0	0	0	0
Total	10.0	3,671	26.7	9,736	0.8	267

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	1.4	497	7.6	2,759
Dry Cows	0.1	39	0.6	207
Support Stock (Heifers, Calves and Bulls)	0.5	190	1.9	677
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	2.0	726	10.1	3,644

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	5.2	1,910
Alfalfa Emissions	0.0	0
Wheat Emissions	6.6	2,414
TMR	40.1	14,650
Total	51.9	18,974

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	1.1	0.4	0.0
Cow Housing	0.0	0.0	30.7	0.0	38.9	74.4	0.0
Liquid Manure	0.0	0.0	0.0	0.0	10.0	26.7	0.8
Solid Manure	0.0	0.0	0.0	0.0	2.0	10.1	0.0
Feed Handling	0.0	0.0	0.0	0.0	51.9	0.0	0.0
Total	0.0	0.0	30.7	0.0	103.9	111.6	0.8

Total Annual Pre-Project Potential to Emit (lb/yr)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	410	133	0
Cow Housing	0	0	11,195	0	14,231	27,152	0
Liquid Manure	0	0	0	0	3,671	9,736	267
Solid Manure	0	0	0	0	726	3,644	0
Feed Handling	0	0	0	0	18,974	0	0
Total	0	0	11,195	0	38,012	40,665	267

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)

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

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.

*Since there will be no change to the lagoons/storage ponds surface area, no change in H2S emissions is expected. Therefore, it will be assumed that PE1 for H2S emissions is equal to PE2 for H2S emissions.

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	1,764
Solid Manure	0	0	0	0	0
Feed Handling	0	0	0	0	0
Total	0	0	0	0	1,764

Post-Project Potential to Emit (PE2)

Post-Project Herd Size						
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals	
Milk Cows	1,985	0	100	0	2,085	
Dry Cows	0	0	260	55	315	
Support Stock (Heifers, Calves, and Bulls)	0	0	40	10	50	
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	
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped
Calves	0	0	0	0	0	0

Silage Information				
Feed Type	Maximum # Open Piles	Maximum Height (ft)	Maximum Width (ft)	Open Face Area (ft²)
Corn	1	60	15	840
Alfalfa	0	0	0	0
Wheat	1	60	15	840

Milking Parlor				
	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Cow				
Milk Cows				
Total	2.3	834	0.8	285

Cow Housing					
	VOC		NH3		PM10
	lb/day	lb/yr	lb/day	lb/yr	lb/day
Total	65.9	24,023	136.4	49,787	9.9

Liquid Manure Handling						
Cow	VOC		NH3		H2S	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	8.3	3,044	28.0	10,217	0.7	246
Dry Cows	0.7	249	2.1	781	0.1	19
Support Stock (Heifers, Calves, and Bulls)	0.1	31	0.2	64	0	2
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	0
Calves	0.0	0	0.0	0	0	0
Bulls	0.0	0	0.0	0	0	0
Total	9.1	3,323	30.3	11,062	0.8	267

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	2.7	1,001	16.2	5,901
Dry Cows	0.2	82	1.2	450
Support Stock (Heifers, Calves, and Bulls)	0.0	10	0.1	38
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	2.9	1,093	17.5	6,389

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	5.2	1,910
Alfalfa Emissions	0.0	0
Wheat Emissions	6.6	2,414
TMR	54.0	19,714
Total	65.8	24,038

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	2.3	0.8	0.0
Cow Housing	0.0	0.0	9.9	0.0	65.9	136.4	0.0
Liquid Manure	0.0	0.0	0.0	0.0	9.1	30.3	0.8
Solid Manure	0.0	0.0	0.0	0.0	2.9	17.5	0.0
Feed Handling	0.0	0.0	0.0	0.0	65.8	0.0	0.0
Total	0.0	0.0	9.9	0.0	146.0	185.0	0.8

Total Annual Post-Project Potential to Emit (lb/yr)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	834	285	0
Cow Housing	0	0	3,652	0	24,023	49,787	0
Liquid Manure	0	0	0	0	3,323	11,062	267
Solid Manure	0	0	0	0	1,093	6,389	0
Feed Handling	0	0	0	0	24,038	0	0
Total	0	0	3,652	0	53,311	67,522	267

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 (EF1 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)

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

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 m³) 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	1,594
Solid Manure	0	0	0	0	0
Feed Handling	0	0	0	0	0
Total	0	0	0	0	1,594

BACT Applicability

Milking Parlor					
VOC Emissions					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	2.3	1.1	0.40	0.42	1.3
Total					1.3
NH3 Emissions					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	0.8	0.4	0.14	0.14	0.4
Total					0.4

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	4.0	3.3	0.70	1.23	2.1
Dry Cows	0.3	0.3	0.38	0.66	0.1
Support Stock (heifers, Calves, and Bulls)	0.0	1.3	0.29	0.52	-0.7
Large Heifers	0.0	0.0	0.29	0.52	0.0
Medium Heifers	0.0	0.0	0.20	0.35	0.0
Small Heifers	0.0	0.0	0.11	0.20	0.0
Calves	0.0	0.0	0.05	0.09	0.0
Bulls	0.0	0.0	0.18	0.32	0.0
Total					1.5

VOC Emissions - Land Application					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	4.3	3.5	0.76	1.33	2.3
Dry Cows	0.4	0.3	0.41	0.72	0.2
Support Stock (heifers, Calves, and Bulls)	0.0	1.4	0.32	0.56	-0.8
Large Heifers	0.0	0.0	0.32	0.56	0.0
Medium Heifers	0.0	0.0	0.22	0.38	0.0
Small Heifers	0.0	0.0	0.12	0.21	0.0
Calves	0.0	0.0	0.06	0.10	0.0
Bulls	0.0	0.0	0.19	0.34	0.0
Total					1.7

NH3 Emissions - Lagoon/Storage Pond(s)					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	6.7	3.2	1.18	1.18	3.5
Dry Cows	0.5	0.2	0.60	0.60	0.3
Support Stock (heifers, Calves, and Bulls)	0.0	0.8	0.32	0.32	-0.8
Large Heifers	0.0	0.0	0.32	0.32	0.0
Medium Heifers	0.0	0.0	0.22	0.22	0.0
Small Heifers	0.0	0.0	0.17	0.17	0.0
Calves	0.0	0.0	0.05	0.05	0.0
Bulls	0.0	0.0	0.43	0.43	0.0
Total					3.0

BACT triggered for NH3 for Lagoon/Storage Ponds					
NH3 Emissions - Land Application					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	21.2	17.1	3.72	6.41	11.3
Dry Cows	1.6	1.3	1.88	3.24	0.8
Support Stock (heifers, Calves, and Bulls)	0.1	4.1	0.96	1.66	-2.3
Large Heifers	0.0	0.0	0.96	1.66	0.0
Medium Heifers	0.0	0.0	0.71	1.22	0.0
Small Heifers	0.0	0.0	0.54	0.94	0.0
Calves	0.0	0.0	0.15	0.27	0.0
Bulls	0.0	0.0	1.35	2.33	0.0
Total					9.9

BACT triggered for NH3 for Liquid Manure Land Application					
H2S Emissions - Lagoon/Storage Pond(s)					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	0.7	0.7	0.12	0.12	0.0
Dry Cows	0.1	0.1	0.06	0.06	0.0
Support Stock (heifers, Calves, and Bulls)	0.0	0.0	0.03	0.03	0.0
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					0.0

Solid Manure Handling					
VOC Emissions - Solid Manure Storage/Separated Solids Piles					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	1.0	0.5	0.18	0.19	0.5
Dry Cows	0.1	0.0	0.10	0.10	0.1
Support Stock (heifers, Calves, and Bulls)	0.0	0.2	0.10	0.08	-0.2
Large Heifers	0.0	0.0	0.08	0.08	0.0
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					0.4

VOC Emissions - Land Application					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	1.7	0.8	0.30	0.32	0.9
Dry Cows	0.1	0.1	0.16	0.17	0.0
Support Stock (heifers, Calves, and Bulls)	0.0	0.3	0.12	0.13	-0.3
Large Heifers	0.0	0.0	0.12	0.13	0.0
Medium Heifers	0.0	0.0	0.08	0.09	0.0
Small Heifers	0.0	0.0	0.05	0.05	0.0
Calves	0.0	0.0	0.02	0.02	0.0
Bulls	0.0	0.0	0.07	0.08	0.0
Total					0.7

NH3 Emissions - Solid Manure Storage/Separated Solids Piles					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	7.6	3.6	1.33	1.33	4.0
Dry Cows	0.6	0.3	0.67	0.67	0.3
Support Stock (heifers, Calves, and Bulls)	0.0	0.9	0.35	0.35	-0.9
Large Heifers	0.0	0.0	0.35	0.35	0.0
Medium Heifers	0.0	0.0	0.25	0.25	0.0
Small Heifers	0.0	0.0	0.18	0.18	0.0
Calves	0.0	0.0	0.06	0.06	0.0
Bulls	0.0	0.0	0.49	0.49	0.0
Total					3.4

BACT triggered for NH3 for Solid Manure Storage					
NH3 Emissions - Land Application					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	8.6	4.0	1.50	1.50	4.6
Dry Cows	0.7	0.3	0.76	0.76	0.4
Support Stock (heifers, Calves, and Bulls)	0.1	1.0	0.40	0.40	-0.9
Large Heifers	0.0	0.0	0.40	0.40	0.0
Medium Heifers	0.0	0.0	0.28	0.28	0.0
Small Heifers	0.0	0.0	0.22	0.22	0.0
Calves	0.0	0.0	0.06	0.06	0.0
Bulls	0.0	0.0	0.55	0.55	0.0
Total					4.1

Feed Storage and Handling					
VOC Emissions - Silage					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Corn Silage	5.2	5.2	21,155	21,155	0.0
Alfalfa Silage	0.0	0.0	10,649	10,649	0.0
Wheat Silage	6.6	6.6	26,745	26,745	0.0
Total					0.0
VOC Emissions - TMR					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
TMR	54.0	40.1	10,575	9,516	13.9
BACT triggered for VOC for TMR					Total
					13.9

Cow Housing - VOC Emissions							
	Housing Name(s) or #s	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)	BACT Triggered?
1	Freestall Barn #1	10.5	10.2	10.13	9.81	0.3	No
2	Freestall Barn #2	0.0	1.4	0.00	5.51	0.0	No
3	Freestall Barn #3	0.0	4.0	0.00	9.81	0.0	No
4	Loading Barn #1 - A	2.3	3.9	5.71	9.81	0.0	No
5	Loading Barn #1 - B	1.7	3.9	4.38	9.81	0.0	No
6	Loading Barn #2 / hospital	4.2	4.0	10.13	9.81	0.2	No
7	Freestall Barn #6	0.0	4.0	0.00	9.81	0.0	No
8	Loading Barn #3	12.5	5.3	10.13	4.28	7.2	Yes
11	Freestall Barn #4	18.7	5.2	10.13	4.28	11.5	Yes
14	Maternity Barn - A	1.0	1.0	5.71	5.51	0.0	No
15	Maternity Barn - B	0.8	0.8	4.38	4.28	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	Freestall Barn #2	11.2	0.0	10.13	0.00	11.2	Yes
2	Freestall Barn #3	16.7	0.0	10.13	0.00	16.7	Yes

Cow Housing - NH3 Emissions							
	Housing Name(s) or #s	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)	BACT Triggered?
	Freestall Barn #1	22.0	22.0	21.13	21.13	0.0	No
	Freestall Barn #2	0.0	2.6	0.00	10.71	0.0	No
	Freestall Barn #3	0.0	8.7	0.00	21.13	0.0	No
	Loading Barn #1 - A	4.3	8.4	10.71	21.13	0.0	No
	Loading Barn #1 - B	2.2	8.4	5.54	21.13	0.0	No
	Loading Barn #2 / hospital	8.7	8.7	21.13	21.13	0.0	No
	Freestall Barn #6	0.0	8.7	0.00	21.13	0.0	No
	Loading Barn #3	28.0	6.8	21.13	5.54	19.2	Yes
	Freestall Barn #4	34.7	6.7	21.13	5.54	28.0	Yes
	Maternity Barn - A	1.9	1.9	10.71	10.71	0.0	No
	Maternity Barn - B	1.0	1.0	5.54	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?
	Freestall Barn #2	23.4	0.0	21.13	0.00	23.4	Yes
	Freestall Barn #3	34.7	0.0	21.13	0.00	34.7	Yes

*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	Freestall Barn #1	1.2	1.4	1.17	1.37	0.0	No
2	Freestall Barn #2	0.0	0.3	0.00	1.37	0.0	No
3	Freestall Barn #3	0.0	0.6	0.00	1.37	0.0	No
4	Loafing Barn #1 - A	1.0	0.5	2.46	1.37	0.5	No
5	Loafing Barn #1 - B	1.9	0.5	4.75	1.37	1.4	No
6	Loafing Barn #2 / hospital	1.0	0.6	2.46	1.37	0.4	No
7	Freestall Barn #6	0.0	0.6	0.00	1.37	0.0	No
8	Loafing Barn #3	3.0	13.0	2.46	10.55	0.0	No
11	Freestall Barn #4	1.9	12.8	1.17	10.55	0.5	No
14	Maternity Barn - A	0.6	0.7	3.48	4.09	0.0	No
15	Maternity Barn - B	1.3	1.6	7.40	8.71	-0.1	No
New Units from Expansion							
	Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	PE2 (lb/day)	BACT Triggered?
1	Freestall Barn #2	1.3	0.0	1.17	0.00	1.3	No
2	Freestall Barn #3	1.9	0.0	1.17	0.00	1.9	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	425	152	0
Cow Housing	0	0	-7,543	0	9,792	22,635	0
Liquid Manure	0	0	0	0	-348	1,326	0
Solid Manure	0	0	0	0	367	2,745	0
Feed Handling	0	0	0	0	5,064	0	0
Total	0	0	-7,543	0	15,299	26,857	0

Total Daily Change in Emissions (lb/day)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	1.2	0.4	0.0
Cow Housing	0.0	0.0	-20.8	0.0	27.0	62.0	0.0
Liquid Manure	0.0	0.0	0.0	0.0	-0.9	3.6	0.0
Solid Manure	0.0	0.0	0.0	0.0	0.9	7.4	0.0
Feed Handling	0.0	0.0	0.0	0.0	13.9	0.0	0.0
Total	0.0	0.0	-20.8	0.0	42.1	73.4	0.0

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	-170	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	-170	0	0

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

The quarterly PE values are calculated as follows: PE (lb/yr) ÷ 4 (qtr/yr)

Using the annual PE2 and PE1 values previously calculated, the QNEC (lb/qtr) for each permit unit is shown below:

Milking Parlor						
	NOx	SOx	PM10	CO	VOC	NH3
Annual PE2 (lb/yr)	0	0	0	0	834	285
Daily PE2 (lb/day)	0.0	0.0	0.0	0.0	2.3	0.8
Quarterly Net Emissions Change (lb/qtr)	1: 0.0	0.0	0.0	0.0	106.1	38.0
	2: 0.0	0.0	0.0	0.0	106.1	38.0
	3: 0.0	0.0	0.0	0.0	106.1	38.0
	4: 0.0	0.0	0.0	0.0	106.1	38.0

Cow Housing						
	NOx	SOx	PM10	CO	VOC	NH3
Annual PE2 (lb/yr)	0	0	3,652	0	24,023	49,787
Daily PE2 (lb/day)	0.0	0.0	9.9	0.0	65.9	136.4
Quarterly Net Emissions Change (lb/qtr)	1: 0.0	0.0	-1,885.8	0.0	2,448.0	5,658.8
	2: 0.0	0.0	-1,885.8	0.0	2,448.0	5,658.8
	3: 0.0	0.0	-1,885.8	0.0	2,448.0	5,658.8
	4: 0.0	0.0	-1,885.8	0.0	2,448.0	5,658.8

Liquid Manure Handling							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Annual PE2 (lb/yr)	0	0	0	0	3,323	11,062	267
Daily PE2 (lb/day)	0.0	0.0	0.0	0.0	9.1	30.3	0.8
Quarterly Net Emissions Change (lb/qtr)	1: 0.0	0.0	0.0	0.0	-87.0	331.4	0.0
	2: 0.0	0.0	0.0	0.0	-87.0	331.4	0.0
	3: 0.0	0.0	0.0	0.0	-87.0	331.4	0.0
	4: 0.0	0.0	0.0	0.0	-87.0	331.4	0.0

Solid Manure Handling						
	NOx	SOx	PM10	CO	VOC	NH3
Annual PE2 (lb/yr)	0	0	0	0	1,093	6,389
Daily PE2 (lb/day)	0.0	0.0	0.0	0.0	2.9	17.5
Quarterly Net Emissions Change (lb/qtr)	1: 0.0	0.0	0.0	0.0	91.7	686.2
	2: 0.0	0.0	0.0	0.0	91.7	686.2
	3: 0.0	0.0	0.0	0.0	91.7	686.2
	4: 0.0	0.0	0.0	0.0	91.7	686.2

Feed Storage and Handling						
	NOx	SOx	PM10	CO	VOC	NH3
Annual PE2 (lb/yr)	0	0	0	0	24,038	0
Daily PE2 (lb/day)	0.0	0.0	0.0	0.0	65.8	0.0
Quarterly Net Emissions Change (lb/qtr)	1: 0.0	0.0	0.0	0.0	1,265.9	0.0
	2: 0.0	0.0	0.0	0.0	1,265.9	0.0
	3: 0.0	0.0	0.0	0.0	1,265.9	0.0
	4: 0.0	0.0	0.0	0.0	1,265.9	0.0

Greenhouse Gas Emissions - CEQA

Uncontrolled GHG Emission Factors (lbs/hd-yr)						
Animal Type	CH4 (Anaerobic Treatment Lagoon)	CH4 (Lagoon)	CH4 (Manure Spreading)	CH4 (Solid Manure Storage)	CH4 (Enteric)	CO2 Equivalent Multiplier for CH4
Milk Cows	513	307.8	3.5	27.7	271.5	21
Dry Cows	513	307.8	3.5	27.7	271.5	21
Support Stock*	110.4	110.4	1.6	--	151.6	21
Large Heifers	110.4	110.4	1.6	--	151.6	21
Medium Heifers	110.4	110.4	1.6	--	150.5	21
Small Heifers	110.4	110.4	1.6	--	150.5	21
Calves	--	--	--	--	--	--
Bulls*	110.4	110.4	1.6	--	151.6	21

Uncontrolled GHG Emission Factors (lbs/hd-yr)					
Animal Type	N2O (Anaerobic Treatment Lagoon)	N2O (Manure Spreading)	N2O (Solid Manure Storage)	N2O (Enteric)	CO2 Equivalent Multiplier for N2O
Milk Cows	1.5	0	2.6	0	310
Dry Cows	1.5	0	2.6	0	310
Support Stock*	1.4	0	--	0	310
Large Heifers	1.4	0	--	0	310
Medium Heifers	1.4	0	--	0	310
Small Heifers	1.4	0	--	0	310
Calves	--	0	--	0	--
Bulls*	1.4	0	--	0	310

*Emission factors for Support Stock and Bulls assumed to be the same as Large Heifers.

1 short ton = 0.9072 metric ton

CO2e from CH4 = [CH4 (anaerobic treatment) lagoon + CH4 manure spreading + CH4 solid manure storage + CH4 enteric] x 21 x 0.9072 metric tons/short tons + 2000 lb/ton

CO2e from N2O = [N2O anaerobic treatment lagoon + N2O manure spreading + N2O solid manure storage + N2O enteric] x 310 x 0.9072 metric tons/short tons + 2000 lb/ton

Pre-Project CO2e Emissions

Pre-Project Lagoon CO2e Emissions from CH4 (metric tons/yr)				
Animal Type	Number of Cows	CH4 Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	975	307.8	21.0	2,859
Dry Cows	145	307.8	21.0	425
Support Stock	903	110.4	21.0	950
Large Heifers	0	110.4	21.0	0
Medium Heifers	0	110.4	21.0	0
Small Heifers	0	110.4	21.0	0
Calves	0	--	--	0
Bulls	0	110.4	21.0	0

Pre-Project Non-Lagoons CO2e Emissions from CH4 (metric tons/yr)						
Animal Type	Number of Cows	CH4 Manure Spreading (lb/hd-yr)	CH4 Solid Manure Storage (lb/hd-yr)	CH4 Enteric (lb/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	975	3.5	27.7	271.5	21.0	2,811
Dry Cows	145	3.5	27.7	271.5	21.0	418
Support Stock	903	1.6	--	151.6	21.0	1,318
Large Heifers	0	1.6	--	151.6	21.0	0
Medium Heifers	0	1.6	--	150.5	21.0	0
Small Heifers	0	1.6	--	150.5	21.0	0
Calves	0	--	--	--	--	0
Bulls	0	1.6	--	151.6	21.0	0

Pre-Project Lagoon CO2e Emissions from N2O (metric tons/yr)				
Animal Type	Number of Cows	N2O Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	975	0.0	310.0	0
Dry Cows	145	0.0	310.0	0
Support Stock	903	0.0	310.0	0
Large Heifers	0	0.0	310.0	0
Medium Heifers	0	0.0	310.0	0
Small Heifers	0	0.0	310.0	0
Calves	0	0.0	--	0
Bulls	0	0.0	310.0	0

Pre-Project Non-Lagoons CO2e Emissions from N2O (metric tons/yr)						
Animal Type	Number of Cows	N2O Manure Spreading (lb/hd-yr)	N2O Solid Manure Storage (lb/hd-yr)	N2O Enteric (lb/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	975	0.0	2.6	0.0	310.0	358
Dry Cows	145	0.0	2.6	0.0	310.0	53
Support Stock	903	0.0	--	0.0	310.0	0
Large Heifers	0	0.0	--	0.0	310.0	0
Medium Heifers	0	0.0	--	0.0	310.0	0
Small Heifers	0	0.0	--	0.0	310.0	0
Calves	0	0.0	--	0.0	--	0
Bulls	0	0.0	--	0.0	310.0	0

Total Pre-Project CO2e Emissions (metric tons/yr)				
Animal Type	CO2e from CH4	CO2e from N2O	Total	
Milk Cows	5,670	358	6,028	
Dry Cows	643	53	696	
Support Stock	2,267	0	2,267	
Large Heifers	0	0	0	
Medium Heifers	0	0	0	
Small Heifers	0	0	0	
Calves	0	0	0	
Bulls	0	0	0	
Total:			9,190	

Post-Project CO2e Emissions

Post-Project Lagoon CO2e Emissions from CH4 (metric tons/yr)				
Animal Type	Number of Cows	CH4 Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	2,085	513.0	21.0	10,180
Dry Cows	315	513.0	21.0	1,538
Support Stock	50	110.4	21.0	53
Large Heifers	0	110.4	21.0	0
Medium Heifers	0	110.4	21.0	0
Small Heifers	0	110.4	21.0	0
Calves	0	--	--	0
Bulls	0	110.4	21.0	0

Post-Project Non-Lagoons CO2e Emissions from CH4 (metric tons/yr)						
Animal Type	Number of Cows	CH4 Manure Spreading (lb/hd-yr)	CH4 Solid Manure Storage (lb/hd-yr)	CH4 Enteric (lb/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	2,085	3.5	27.7	271.5	21.0	6,012
Dry Cows	315	3.5	27.7	271.5	21.0	908
Support Stock	50	1.6	--	151.6	21.0	73
Large Heifers	0	1.6	--	151.6	21.0	0
Medium Heifers	0	1.6	--	150.5	21.0	0
Small Heifers	0	1.6	--	150.5	21.0	0
Calves	0	--	--	--	--	0
Bulls	0	1.6	--	151.6	21.0	0

Post-Project Lagoon CO2e Emissions from N2O (metric tons/yr)				
Animal Type	Number of Cows	N2O Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	2,085	1.5	310.0	440
Dry Cows	315	1.5	310.0	66
Support Stock	50	1.4	310.0	10
Large Heifers	0	1.4	310.0	0
Medium Heifers	0	1.4	310.0	0
Small Heifers	0	1.4	310.0	0
Calves	0	--	--	0
Bulls	0	1.4	310.0	0

Post-Project Non-Lagoons CO2e Emissions from N2O (metric tons/yr)						
Animal Type	Number of Cows	N2O Manure Spreading (lb/hd-yr)	N2O Solid Manure Storage (lb/hd-yr)	N2O Enteric (lb/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	2,085	0.0	2.6	0.0	310.0	792
Dry Cows	315	0.0	2.6	0.0	310.0	115
Support Stock	50	0.0	--	0.0	310.0	0
Large Heifers	0	0.0	--	0.0	310.0	0
Medium Heifers	0	0.0	--	0.0	310.0	0
Small Heifers	0	0.0	--	0.0	310.0	0
Calves	0	0.0	--	0.0	--	0
Bulls	0	0.0	--	0.0	310.0	0

Total Post-Project CO2e Emissions (metric tons/yr)			
Animal Type	CO2e from CH4	CO2e from N2O	Total
Milk Cows	16,201	1,202	17,403
Dry Cows	2,448	182	2,629
Support Stock	126	10	135
Large Heifers	0	0	0
Medium Heifers	0	0	0
Small Heifers	0	0	0
Calves	0	0	0
Bulls	0	0	0
Total:			20,167

Change in CO2e Emissions

Change in Project GHG Emissions			
Animal Type	Pre-Project CO2e (metric tons/yr)	Post-Project CO2e (metric tons/yr)	Change (metric tons/yr)
Milk Cows	6,026	17,403	11,376
Dry Cows	696	2,629	1,933
Support Stock	2,267	135	-2,132
Large Heifers	0	0	0
Medium Heifers	0	0	0
Small Heifers	0	0	0
Calves	0	0	0
Bulls	0	0	0
Total:			10,977

APPENDIX H

Anaerobic Treatment Lagoon Design Check

Lagoon Design Check in Accordance with NRCS Guideline #359

Proposed Lagoon Volume		
Storage Pond #1	834,417	ft3 Per facility's Waste Management Plan Report
Settling Basin #1	246,212	ft3 Per facility's Waste Management Plan Report
Settling Basin #2	252,795	ft3 Per facility's Waste Management Plan Report
Total Lagoon Volume	1,333,424	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 of Cow	Number of Animals	VS Excreted ^[1] (lb/day)	% Manure in Flush ^[2]	x	(1 - % VS Removed in Separation ^[3])	Net VS Loading (lb/day)
Milk Cows	2,085	17	71%	x	50%	12,583
Dry Cow	315	9.2	60%	x	50%	869
Heifer (15 to 24 months)	50	7.1	60%	x	50%	107
Heifer (7 to 14 months)	0	4.9	48%	x	50%	0
Heifer (3 to 6 months)	0	2.7	48%	x	50%	0
Calf (under 3 months)	0	1.0	100%	x	50%	0
Bulls	0	9.2	48%	x	50%	0
Total for Dairy						13,559

^[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.

Lagoon Design Check in Accordance with NRCS Guideline #359

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	Net VS Loading (lb/day)		VSLR (lb/ft3-day)[1]	MTV (ft³)
Milk Cows	12,583	÷	0.011	= 1,143,907
Dry Cow	869	÷	0.011	= 79,036
Heifer (15 to 24 months)	107	÷	0.011	= 9,682
Heifer (7 to 14 months)	0	÷	0.011	= 0
Heifer (3 to 6 months)	0	÷	0.011	= 0
Calf (under 3 months)	0	÷	0.011	= 0
Bulls	0	÷	0.011	= 0
Total for Dairy				1,232,625

[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:

$$\text{SAV} = \text{VPL} - \text{MTV}$$

Where:

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

$$\text{SAV} = \text{VPL} - \text{MTV}$$

$$\text{SAV} = 1,333,424 - 1,232,625 = 100,799 \text{ (ft}^3\text{)}$$

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	2,085	x	2.40	ft ³	= 5,004 ft ³ /day
Dry Cows	315	x	1.30	ft ³	= 410 ft ³ /day
Heifers (15-24 mo)	50	x	0.78	ft ³	= 39 ft ³ /day
Heifers (7-14 mo)	0	x	0.78	ft ³	= - ft ³ /day
Heifers (3-6 mo)	0	x	0.30	ft ³	= - ft ³ /day
Calves	0	x	0.15	ft ³	= - ft ³ /day
Bulls	0	x	1.30	ft ³	= - ft ³ /day
Total	2,450				5,453 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	2085 milk-cows	x	ft3	+	5,453	ft3
milk-cow * day			7.48 gal			day
			=	19,389.7	ft3/day	

Formula:

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

HRT:

↑

1,232,625 ft3	day	=	63.571235	days
	19,389.7 ft3			

Waste Management Plan Report
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July 1, 2010 deadline

LIQUID STORAGE

A. POND OR BASIN DESCRIPTION: Settling Basin #1

Pond is rectangular in shape: ☒ Yes ☐ No

Dimensions

Earthen Length (EL):	<u>830 ft.</u>	Earthen Depth (ED):	<u>5 ft.</u>
Earthen Width (EW):	<u>82 ft.</u>	Side Slope (S):	<u>1.2 ft. (h:1v)</u>
Free Board (FB):	<u>1 ft.</u>	Dead Storage Loss (DS):	<u>0.0 ft.</u>

Calculations

Liquid Length (LL):	<u>828 ft.</u>	Storage Volume Adjusted for Dead Storage Loss:	<u>246,212 cu. ft.</u>
Liquid Width (LW):	<u>80 ft.</u>		
Pond Surface Area:	<u>68,060 sq. ft.</u>	Pond Marker Elevation:	<u>3.5 ft.</u>
Storage Volume:	<u>246,212 cu. ft.</u>	Evaporation Volume:	<u>250,947 gals/period</u>
		Adjusted Surface Area:	<u>65,298 sq. ft.</u>

POND OR BASIN DESCRIPTION: Settling Basin #2

Pond is rectangular in shape: ☒ Yes ☐ No

Dimensions

Earthen Length (EL):	<u>830 ft.</u>	Earthen Depth (ED):	<u>5 ft.</u>
Earthen Width (EW):	<u>84 ft.</u>	Side Slope (S):	<u>1.2 ft. (h:1v)</u>
Free Board (FB):	<u>1 ft.</u>	Dead Storage Loss (DS):	<u>0.0 ft.</u>

Calculations

Liquid Length (LL):	<u>828 ft.</u>	Storage Volume Adjusted for Dead Storage Loss:	<u>252,795 cu. ft.</u>
Liquid Width (LW):	<u>82 ft.</u>		
Pond Surface Area:	<u>69,720 sq. ft.</u>	Pond Marker Elevation:	<u>3.5 ft.</u>
Storage Volume:	<u>252,795 cu. ft.</u>	Evaporation Volume:	<u>257,304 gals/period</u>
		Adjusted Surface Area:	<u>66,952 sq. ft.</u>

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POND OR BASIN DESCRIPTION: Wastewater Storage #2

Pond is rectangular in shape: ☒ Yes ☐ No

Dimensions

Earthen Length (EL):	<u>918 ft.</u>	Earthen Depth (ED):	<u>10 ft.</u>
Earthen Width (EW):	<u>133 ft.</u>	Side Slope (S):	<u>2.7 ft. (h:1v)</u>
Free Board (FB):	<u>2 ft.</u>	Dead Storage Loss (DS):	<u>1.0 ft.</u>

Calculations

Liquid Length (LL):	<u>907 ft.</u>	Storage Volume Adjusted for Dead Storage Loss:	<u>643,163 cu. ft.</u>
Liquid Width (LW):	<u>122 ft.</u>	Pond Marker Elevation:	<u>7.4 ft.</u>
Pond Surface Area:	<u>122,094 sq. ft.</u>	Evaporation Volume:	<u>419,993 gals/period</u>
Storage Volume:	<u>713,975 cu. ft.</u>	Adjusted Surface Area:	<u>109,285 sq. ft.</u>

POND OR BASIN DESCRIPTION: Wastewater Storage Pond #1

Pond is rectangular in shape: ☒ Yes ☐ No

Dimensions

Earthen Length (EL):	<u>918 ft.</u>	Earthen Depth (ED):	<u>10 ft.</u>
Earthen Width (EW):	<u>150 ft.</u>	Side Slope (S):	<u>2.7 ft. (h:1v)</u>
Free Board (FB):	<u>2 ft.</u>	Dead Storage Loss (DS):	<u>1.0 ft.</u>

Calculations

Liquid Length (LL):	<u>907 ft.</u>	Storage Volume Adjusted for Dead Storage Loss:	<u>748,871 cu. ft.</u>
Liquid Width (LW):	<u>139 ft.</u>	Pond Marker Elevation:	<u>7.4 ft.</u>
Pond Surface Area:	<u>137,700 sq. ft.</u>	Evaporation Volume:	<u>479,224 gals/period</u>
Storage Volume:	<u>834,417 cu. ft.</u>	Adjusted Surface Area:	<u>124,697 sq. ft.</u>

6,241,439 gallons

Potential storage losses (due to dead storage):	<u>156,358.0 cubic feet - or -</u>	<u>1,169,639.1 gallons</u>
Liquid storage surface area:	<u>370,551 sq. ft.</u>	
Rainfall onto retention pond(s):	<u>1,690,257 gallons/storage period</u>	
Rainfall runoff into retention pond(s):	<u>1,516,662 gallons/storage period</u>	
Normal rainfall onto retention pond(s) with 1.5 factor:	<u>2,535,386 gallons/storage period</u>	
Normal rainfall runoff into retention pond(s) with 1.5 factor:	<u>2,274,993 gallons/storage period</u>	
Storage period evaporation (default):	<u>8.22 inches/storage period</u>	
Storage period evaporation (user-override):	<u> inches/storage period</u>	
Storage period evaporation volume:	<u>1,407,468 gallons/storage period</u>	
Manure and bedding sent to pond(s):	<u>3,171,889 gallons/storage period</u>	

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Milkbarn water sent to pond(s):	<u>4,231,200</u> gallons/storage period
Fresh flush water for storage period:	<u>0</u> gallons/storage period

APPENDIX I

PE Calculations for Unit N-6217-6-0

N-6217-6-0:

Diesel-fired IC Engine Emission Factors			
	lb/hp-hr	g/hp-hr*	Source
NO _x	0.02205	10.00	Carl Moyer Program
SO _x	-	0.0051	Mass Balance Equation Below
PM ₁₀	0.0011	0.475	Carl Moyer Program
CO	0.0068	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.

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

Annual Potential to Emissions (PE)								
NO _x	10.00	(g/hp-hr) x	250	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	551	(lb/yr)
SO _x	0.0051	(g/hp-hr) x	250	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	0	(lb/yr)
PM ₁₀	0.475	(g/hp-hr) x	250	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	26	(lb/yr)
CO	3.04	(g/hp-hr) x	250	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	168	(lb/yr)
VOC	1.14	(g/hp-hr) x	250	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	63	(lb/yr)