

PROPOSED MITIGATED NEGATIVE DECLARATION  
AND INITIAL STUDY  
**BAR 20 DAIRY**

January 2008

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**SECTION ONE**

**MITIGATED NEGATIVE DECLARATION AND  
MITIGATION MONITORING PROGRAM**

# SECTION ONE – PROPOSED MITIGATED NEGATIVE DECLARATION

## 1.1 *The Project*

The project proponent has applied to the San Joaquin Valley Air Pollution Control District (The Air District) for a permit to increase the number of milking cows on existing dairy facilities by 6,496, from 2,904 to 9,400; and make concomitant changes in the dairies' support stock. The dairy facilities (corrals, dairy barn, feed storage, manure management area and process water storage area, etc.) are located at 24387 Whites Bridge Road (SR 180), approximately 6 miles west of Kerman, in Fresno County.

## 1.2 *Purpose and Authority*

The purpose (objective) of the project is to operate an economically viable and competitive dairy facility in compliance with applicable laws and regulations, optimally utilizing the available land resources and mitigating all potentially significant impacts to a less than significant level in accord with the California Environmentally Quality Act (CEQA).

The San Joaquin Valley Air Pollution Control District (Air District) is the lead agency pursuant to California CEQA Guidelines, Section 15050. Consistent with these guidelines this Mitigated Negative Declaration evaluates and discusses the project's potential environmental impacts together with feasible mitigation measures that adequately mitigate these impacts.

## 1.3 *Decision to Prepare a Mitigated Negative Declaration*

In August 2000 the Air District adopted *Environmental Review Guidelines Procedures for Implementing the California Environmental Quality Act*. Section 4.3.3 of these guidelines state:

*“Following completion of the Initial Study, the SJVUAPCD will review the potential impacts along with the recommendations of the trustee agencies and responsible agencies to determine if substantial evidence exists that the project will have a significant effect on the environment. If there are no significant effects, the SJVUAPCD will prepare a Negative Declaration. If there are significant effects, but those effects can be mitigated to a level considered less than significant, the SJVUAPCD will prepare a Mitigated Negative Declaration and incorporate the mitigation measures into the project. When an individual or entity other than the SJVUAPCD is undertaking the project, the project applicant must agree to the incorporation of the measures into the project. If there are unavoidable significant effects, the SJVUAPCD will prepare an EIR. The Director of Planning or his designee shall make this determination.”*

The CEQA Guidelines defines significant effect on the environment as “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance.” When “substantial evidence exists, in the light of the whole record before the Lead Agency, that a project may have a significant effect on the environment”, the agency must prepare a draft EIR [CCR §15064(a)(1)].

Based on the evidence and facts set forth in the Initial Study, the Air District finds that all potentially significant impacts will be mitigated to a less than significant level.

#### **1.4 Proposed Mitigated Negative Declaration**

**Title:** Bar 20 Dairy

**Location:** 24387 Whites Bridge Road

**City:** 6 miles west of Kerman

**County:** Fresno

**Section:** 5    **Township:** 13S    **Range:** 16E    **Meridian:** Mount Diablo

**Contact:** Chris Kalashian

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1. This is to advise of the following determinations regarding this action:
  - a. This Mitigated Negative Declaration together with an Initial Study is prepared and circulated pursuant to *Section 11105 of the CEQA Guidelines*.
  - b. Copies of the Mitigated Negative Declaration and Initial Study are being made available for public review at the San Joaquin Valley Air Pollution Control Office, 1990 East Gettysburg Ave. Fresno 93726.
  - c. A public notice was placed in a newspaper of general circulation in the Fresno area. The public notice described the proposed project and the dates when the District would receive public comments.
  - d. Responses to all comments on the Mitigated Negative Declaration and Initial Study will be prepared, and copies furnished to commenting persons and/or agencies.
  - e. The project has been found not to have a significant effect on the environment, with the mitigation measures incorporated in the project design and set forth in the Mitigation Monitoring Program.
2. Enclosed and incorporated as part of the Mitigated Negative Declaration is the Initial Study.

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ARNAUD MARJOLLET, Permit Service Manager

## 1.5 Mitigation Monitoring Program

State and local agencies are required by *Section 21081.6* of the *California Public Resources Code* to establish a monitoring program for all projects which are approved and which require CEQA processing.

Local agencies are given broad latitude in developing programs to meet the requirements of *Public Resources Code Section 21081.6*. The mitigation monitoring program outlined in this document is based upon guidance issued by the Governor's Office of Planning and Research.

The mitigation monitoring program for the proposed project corresponds to mitigation measures outlined in the Initial Study. The Program summarizes the environmental issues identified in the Initial Study, the mitigation measures required to reduce each potentially significant impact to less than significant, the person or agency responsible for implementing the measures, and the agency or agencies responsible for monitoring and reporting on the implementation of the mitigation measures.

## 1.6 The Program

Operation of the dairy will require a Permit to Operate from the SJVAPCD: and an acceptance by the California Regional Water Quality Control Board of a Report of Waste Discharge or other approval.

The mitigation measures contained herein shall be included as conditions of approval for each of these permits, to the extent permitted by law. The SJVAPCD shall ensure that all project operations conform to the conditions of the mitigated project. Table 1-1 shall be attached to all permits as a condition of approval.

**Table 1-1  
Mitigation Monitoring Program**

Mitigation Measures	Implementation	Monitoring
<b>Mitigation Measure 2.6.3.1-1 Reduction of Greenhouse Gas Emissions (quantifiable)</b>	Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.	Monitoring shall be the responsibility of the SJVAPCD.
1. All animals fed in accordance with National Research Council (NRC) or other District approved guidelines utilizing routine nutritional analysis for rations.		
2. Weekly scraping of freestall exercise pens and open corrals using a pull-type scraper in the morning hours except when prevented by wet conditions. Cover dry animal waste piles outside the pens with a weatherproof covering from October through May, except for times, not to exceed 24 hours per event, when wind events remove the covering.		
3. Solid manure applied to fields shall be incorporated into the soil immediately (within two hours) after application.		

Mitigation Measures	Implementation	Monitoring
<p><b>Mitigation Measure 2.6.3.1-2 Reduction of Greenhouse Gas Emissions (non-quantifiable)</b></p> <ol style="list-style-type: none"> <li>Downwind windbreak designed in accordance to the NRCS guideline #380.</li> <li>All open corrals adequately sloped to promote drainage (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).</li> <li>Maintain corrals to ensure drainage and prevent water from standing more than 48 hours after a storm.</li> <li>Knockdown fence line animal waste build-up prior to its exceeding a height of 12 inches at any time or point.</li> </ol>	<p>Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.</p>	<p>Monitoring shall be the responsibility of the SJVAPCD.</p>
<p><b>Mitigation Measure 2.6.3.2-2 PM<sub>10</sub> Control Measures – Expanded Dairy Facility</b></p> <ol style="list-style-type: none"> <li>Milk cows housed in freestalls shall not be allowed in exercise pens. Exercise pens shall be permanently blocked off and made inaccessible.</li> <li>Shade structures shall be provided for the following cows: 950 heifers (15-24 months) and 950 heifers (7-14 months). Saudi-style barns shall be provided for the following: 200 milk cows, 1,000 dry cows, 300 heifers (15-24 months), 100 heifers (7-14 months) and 700 heifers (4-6 months). Calves shall be housed in individual above-ground calf hutches.</li> <li>Sufficient sprinkling shall be undertaken in heifer corrals (heifers 7-14 months) to match daily evaporation.</li> <li>At least one of the daily feedings of the heifers shall be near (within one hour of) dusk.</li> <li>Weekly scraping of corrals using pull-type scraper in the morning hours except when prevented by wet conditions (this also applies to the existing dairy).</li> <li>Dry manure (both facilities) shall not be applied to fields when wind speeds exceed 10 miles per hour.</li> <li>Field perimeter roads and onsite facility roads shall be stabilized such that no visible dust clouds beyond the site boundary from manure spreading or agricultural service vehicles using these roads. All onsite dairy facility roads shall be surfaced with gravel, sand, or decomposed granite.</li> <li>Mud or dirt on project-adjacent public roads which originates from project operations shall be removed within 24 hours of deposition.</li> </ol>	<p>Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.</p>	<p>Monitoring shall be the responsibility of the SJVAPCD.</p>

Mitigation Measures	Implementation	Monitoring																		
<p>9. Begin establishing windbreak(s) around the dairy in accordance with National Resource Conservation Practice Standard Code 380-Windbreak/Shelterbelt establishment or other District-approved guidelines for downwind windbreaks for all cows and upwind windbreaks for all cows except milk and dry cows.</p>																				
<p><b>Mitigation Measure #2.6.3.2-3 PM<sub>10</sub> Control Measures – Existing Dairy Facility:</b> In addition to the control measures directed to the expanded milk cow herd, the owner/operator has agreed to implement the following measures at the existing permitted dairy facility site:</p>	<p>Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.</p>	<p>Monitoring shall be the responsibility of the SJVAPCD.</p>																		
<p>1. The cow herd at the existing dairy to be reduced from 6,204 to 5,610 cows; the herd composition to be:</p>																				
<table border="1"> <thead> <tr> <th>Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Milking cows</td> <td>2,600</td> </tr> <tr> <td>Dry cows</td> <td>500</td> </tr> <tr> <td>Heifers (15-24 months)</td> <td>1,000</td> </tr> <tr> <td>Heifers (7-14 months)</td> <td>800</td> </tr> <tr> <td>Calves (4-6 months)</td> <td>400</td> </tr> <tr> <td>Calves (under 3 months)</td> <td>300</td> </tr> <tr> <td>Bulls</td> <td>10</td> </tr> <tr> <td><b>Total</b></td> <td><b>5,610</b></td> </tr> </tbody> </table>	Type	Number	Milking cows	2,600	Dry cows	500	Heifers (15-24 months)	1,000	Heifers (7-14 months)	800	Calves (4-6 months)	400	Calves (under 3 months)	300	Bulls	10	<b>Total</b>	<b>5,610</b>		
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<p>2. At least one of the daily feedings of the heifers shall be near (within one hour of) dusk.</p>																				
<p>3. Weekly scraping of corrals using pull-type scraper in the morning hours except when prevented by wet conditions.</p>																				
<p>4. In accordance with National Resource Conservation Service (NRCS) Conservation Practice Standard Code 380-</p>																				
<p>Windbreak/Shelterbelt shall install upwind shelterbelts for heifers 7-14 months of age.</p>																				
<p>5. Sufficient sprinkling in heifer corrals (heifers ages between 7-24 months) to match dairy evaporation.</p>																				
<p><b>Mitigation Measure #2.6.3.2-4 PM<sub>10</sub> Offset Purchase:</b></p>	<p>Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.</p>	<p>Monitoring shall be the responsibility of the SJVAPCD.</p>																		
<p>1. The owner/applicant has purchased 3.47 tons of PM<sub>10</sub> (at the appropriate Distance Offset ratio).</p>																				
<p><b>Mitigation Measure #2.6.3.3-1 VOC Control Measure – Expanded Dairy Facility:</b></p>	<p>Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.</p>	<p>Monitoring shall be the responsibility of the SJVAPCD.</p>																		
<p>1. Flush/Spray down milking parlor(s) immediately prior to, immediately after, or during the milking of each group of cows.</p>																				

Mitigation Measures	Implementation	Monitoring
2. Concrete feed lanes and walkways.		
3. All but 200 milk cows housed in freestall barns with water drainage to separator facilities.		
4. Feed lanes and walkways for all milk and dry cows flushed at least four times per day.		
5. All corrals adequately sloped to promote and achieve full drainage.		
6. Corrals shall be managed to ensure drainage and prevent water from standing more than forty-eight (48) hours after a storm.		
7. Leachate from the silage piles shall be collected and sent to a waste treatment system such as a lagoon in a timely manner (minimum of once every twenty-four (24) hours).		
8. All animals fed in accordance with National Research Council (NRC) or other District approved guidelines utilizing routine nutritional analysis for rations.		
9. Silage shall be fully enclosed or covered with tarps, except for the area where feed is being removed from the pile.		
10. Silage Face Management (only disturb the required area of face – leave remaining area undisturbed).		
11. Refused feed shall be pushed up to be re-fed or removed from feed lanes on a daily basis to prevent decomposition.		
12. Solid manure shall be harrowed in thin layers in corrals and drying areas to facilitate aerobic drying. This requirement shall not apply when wet weather conditions make this practice infeasible.		
13. Installation of a two-stage anaerobic treatment lagoon designed to NRCS Guidelines.		
14. Solid manure shall be incorporated into fields immediately (within two hours) after application.		
<b>Mitigation Measure #2.6.3.3-2 VOC Control Measures – Existing Dairy Facility:</b> Control measures shall also be required for operation of the existing dairy.	Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.	Monitoring shall be the responsibility of the SJVAPCD.
1. Flush/Spray down milking parlor(s) immediately prior to, immediately after, or during the milking of each group of cows.		
2. Feed lanes and walkways for all milk and dry cows flushed at least four times per day.		
3. At least one of the daily feedings of the heifers shall be near (within one hour of) dusk.		

Mitigation Measures	Implementation	Monitoring
<ol style="list-style-type: none"> <li>4. All animals fed in accordance with National Research Council (NRC) or other District-approved guidelines utilizing routine nutritional analysis for rations.</li> <li>5. Weekly scraping of corrals using pull-type scraper in the morning hours except when prevented by wet conditions.</li> <li>6. Irrigation of crops using liquid and slurry manure from a holding/storage ponds.</li> <li>7. Utilization of manure water and manure will be in thin layers, blending such manure water with irrigation water in compliance with the nutrient management plan.</li> </ol>		
<p><b>Mitigation Measure #2.6.3.3-3 Reduction in Milking Cows:</b> In addition to the above VOC control measures the owner applicant has agreed to reduce the number of milking cows in Fresno County.</p>	<p>Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.</p>	<p>Monitoring shall be the responsibility of the SJVAPCD.</p>
<ol style="list-style-type: none"> <li>1. The owner/applicant shall purchase and permanently close two dairies in the District. The 1,174 milking cows thereon shall be transferred to the Bar 20 Dairy. (The two dairies are the JMC Dairy located on 13<sup>th</sup> Street approximately ½ mile north of Grangeville Boulevard in Kings County, 504 milking cows, and the Joe Machado Dairy located on Henry Street approximately 1-1/2 miles west of State Route 99 in Merced County, 670 milking cows.) Total reduction in VOC emissions by 11.33 tons.</li> <li>2. From a third dairy site in Fresno County, located at Madison Avenue and Brawley avenue 17 miles east of the project site, the owner/applicant shall transfer 433 milking cows, 53 dry cows, and 11 heifers to the Bar 20 Dairy, and shall then convert this dairy into a heifer ranch. The heifer ranch shall be limited to 400 heifers (200 age 15-24 months and 200 under 15 months). Total reduction in VOC emissions by 2.88 tons. The increase in VOC emissions from this project is equal to 28.71 tons. Considering the above mitigation measure, the increase is 14.5 tons of VOCs (28.71 – 11.33 – 2.88 = 14.502 tons).</li> </ol>		
<p><b>Mitigation Measure #2.6.3.3-4 Purchase of Emission Reduction Credits:</b></p>	<p>Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.</p>	<p>Monitoring shall be the responsibility of the SJVAPCD.</p>
<ol style="list-style-type: none"> <li>1. The owner/applicant has purchased 4.9 tons of VOC at the appropriate Distance Offset Ratio.</li> </ol>		
<p><b>Mitigation Measure #2.6.3.3-5:</b> Although project impacts are less than significant the following mitigation measure is recommended to further reduce NOx emissions.</p>	<p>Mitigation measure shall be implemented by the owner/operator and shall be a condition of the Permit to Operate.</p>	<p>Monitoring shall be the responsibility of the SJVAPCD.</p>
<ol style="list-style-type: none"> <li>1. Employees will be encouraged to carpool-travel to and from the project site.</li> </ol>		

<b>Mitigation Measures</b>	<b>Implementation</b>	<b>Monitoring</b>
2. Idling time of on-site project farming and dairy operations equipment shall be minimized.		
3. All on-site equipment shall be properly tuned and maintained in accord with manufacturer's specifications.		
4. Whenever feasible, alternative fueled or electrical on-site equipment shall be utilized.		
5. Minimum practicable on-site engine sizes shall be used.		
6. On-site gasoline powered equipment shall be equipped with catalytic converters.		
7. Employees will be encouraged to carpool to and from the project site.		

**SECTION TWO**

**INITIAL STUDY**

## **SECTION TWO – INITIAL STUDY**

### **2.1 Project Location**

Bar 20 Dairy is located at 24387 West Whites Bridge Road, approximately 6 miles west of the City of Kerman (see Figure 2-1). The existing 3,902-acre project site includes 2 dairy facilities sites (corrals, dairy barn, feed storage area, process water lagoons, etc.) totaling 482 acres. The remaining 3,420 acres is devoted to field crops, farm roads, water well sites and irrigation canals.

### **2.2 Project Objective**

It is the objective of the project to operate an economically viable and competitive dairy in compliance with applicable laws and regulations, optimally utilizing the available land resource, and mitigating environmental impacts to the extent feasible and as required by CEQA.

### **2.3 Project Background**

The project is a component of Fresno County's and the San Joaquin Valley dairy industry. Statistics provided by the Fresno County Agricultural Commissioner in the 2005 Annual Crop Report detail the financial impact of the dairy industry on the local economy. Milk production values in Fresno County were \$334,383,000 in 2005.

### **2.4 Description of the Project**

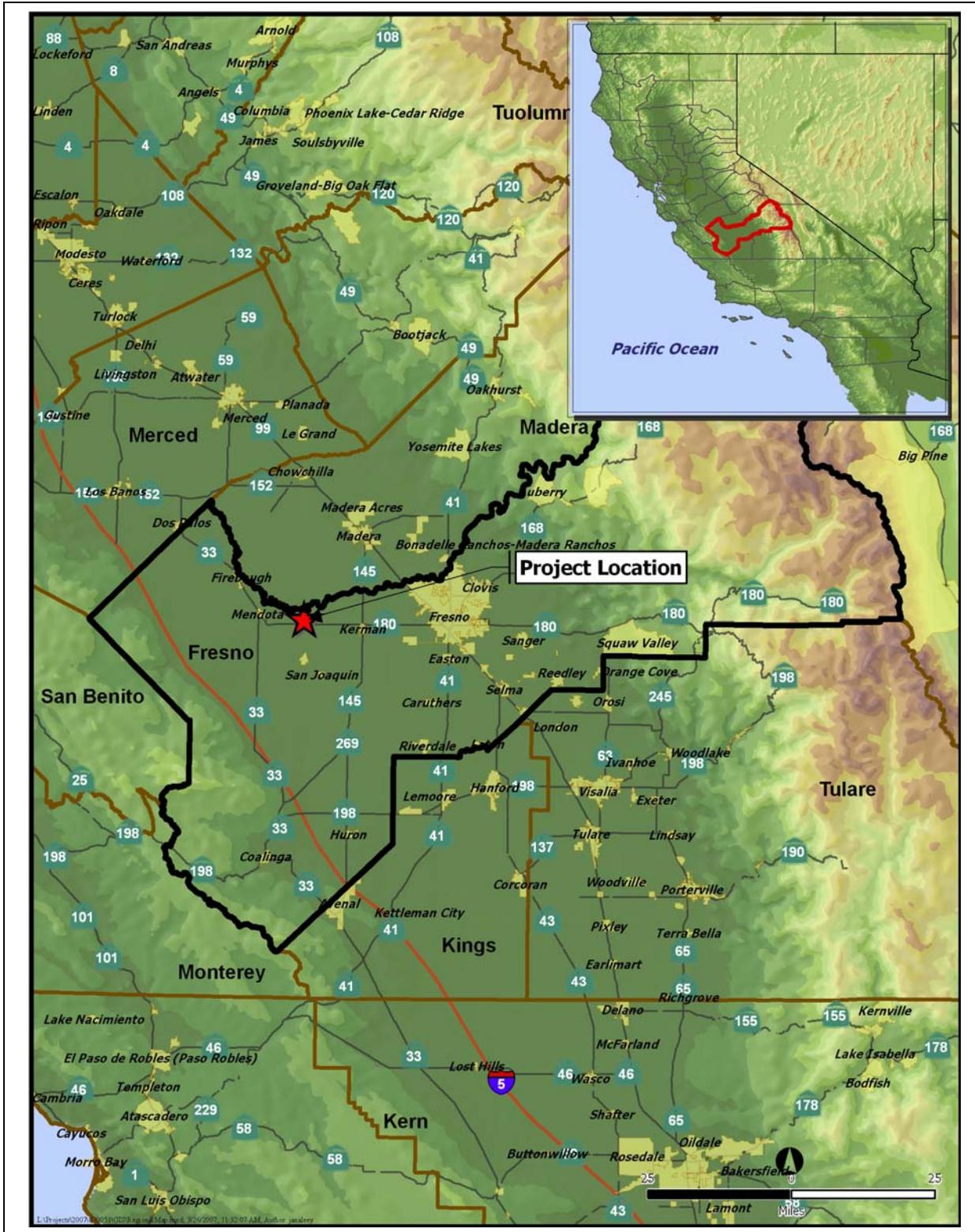
The project proponent has applied to the SJVAPCD for a permit to increase the number of milking cows on 2 adjacent dairy facilities by 6,496 from 2,904 to 9,400 milk cows. The additional 6,496 Holstein milk cows will be supported by 1,057 dry cows, 4,250 heifers and 700 calves. For clarity in evaluation of air emissions impacts and mitigation measures the project is defined as including such increase on an "existing" dairy facility and an "expanded dairy facility" although both facilities currently exist.

The 3,902-acre project site is located in a Fresno County AE-20 (Exclusive Agriculture 20-Acre Minimum) zone. The dairy facilities occupy 482 acres on the north and south side of Whites Bridge Road. All of the dairy cropland is north of Whites Bridge Road in current agricultural production including alfalfa and corn silage/wheat (double cropped).

The location of the project site is shown on Figure 2-2. The dairy facilities sites are depicted on Figure 2-3.

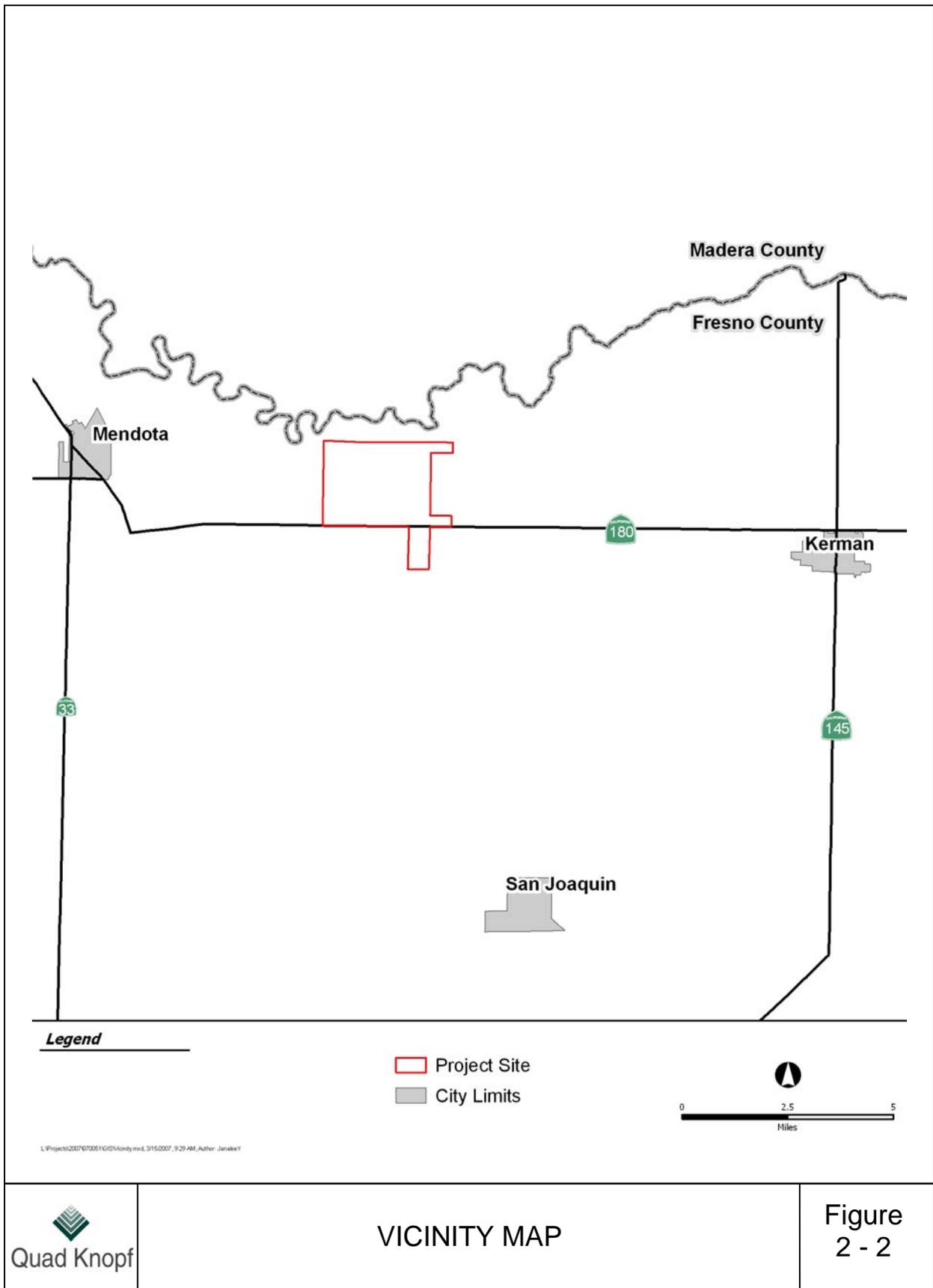
The project is designed to maximize the available land for the production of feed to meet the dairys' forage needs, thereby minimizing the necessity for imported feed. Utilization of manure water provides necessary nutrients for on-site feed production, and reduces the need for groundwater usage for irrigation.

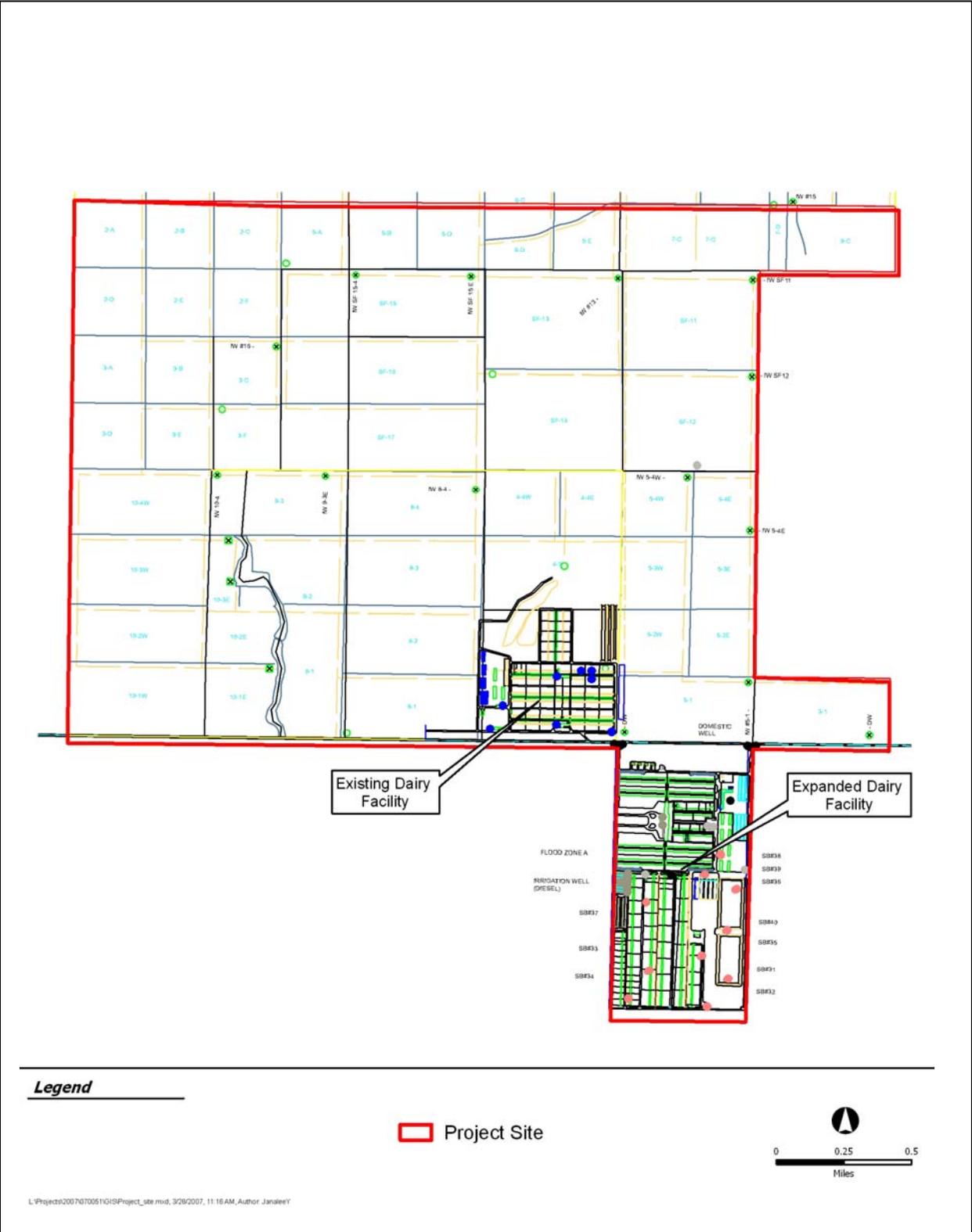
The dairy facility operation includes milking cows in freestall barns with flush systems and dry cows in corrals with flushed alleys. Liquid waste is processed through separator basins and "weeping walls", which remove solids from liquids; liquids then flow into wastewater lagoons.



REGIONAL LOCATION

Figure 2 - 1





PROJECT SITE

Figure 2 - 3

The dairy structures – barns, freestalls, etc. – are metal frame. Each milking cow is provided an individual bedded-stall in the freestall structure. The milking cows are generally kept in the stalls except when they are walked to the milking barn on concrete walk lanes.

The floors of the freestalls are concrete. Curbs separate the feed lane from the freestalls in order to facilitate flushing and enclose feed. All dairy facilities areas are sloped to prevent ponding of water and to divert and convey rainfall runoff to the separated basins and wastewater lagoons.

A substantial percentage of the forage feed – corn and wheat – is produced on agricultural land at the project site. All fields have return water facilities. The remainder of the forage feed, and feed concentrate, is imported to the site from outside sources. The feed is stored in hay barns and on concrete pads.

Further descriptive project details relevant to the environmental analysis are provided in the appropriate topical areas of Section 2.6 of this Initial Study.

## **2.5 Environmental Setting**

Located in a rural farm area in Fresno County, the project area is zoned AE-20 (Exclusive Agricultural District, 20-acre minimum lot size). The land surrounding the site is dedicated to field crops such as corn, wheat, and alfalfa which will in part be used as fodder for the herd (see Figure 2-4). The Fresno County General Plan Land Use Element shows this portion of the County as agricultural.

The climate of the project area is characteristic of that of the Central San Joaquin Valley. The summer climate is hot and dry, while the winters are cool and periodically humid. Mean daily maximum temperatures range from a low of approximately 57 degrees F in December and January to a high of about 99 degrees F in July.

Rainfall is concentrated during the six months from November to April. December and January typically experience heavy fog, mostly nocturnal, caused when moist cool air is trapped in the valley by high-pressure systems. In extreme cases, this fog may last continuously for two or three weeks. Its depth is usually less than 3,000 feet.

The project area is subject to characteristic seasonal airflows. During the summer, air currents from the Pacific Ocean enter the Valley through the San Francisco Bay and Delta region and are forced down the valley. These air movements are primarily to the southeast at velocities of six to ten miles per hour. During the winter, cold air flowing off the surrounding mountains results in currents toward the northwest and velocities ranging from zero to five miles per hour. These airflows result in extensive horizontal mixing of air masses in the Valley. However, vertical dispersion is constrained by temperature inversions, an increase in air temperature in a stable atmospheric layer, which may occur throughout the year.



**Legend**

- |                         |                              |               |  |
|-------------------------|------------------------------|---------------|--|
| ● Residences            | Land Use                     | ■ Golf Course |  |
| ▨ Dairy Facilities Site | ■ Fallow / Native Vegetation | ■ Orchard     |  |
| ■ Project Site          | ■ Field Crops                | ■ Vineyard    |  |

L:\Projects\2007\070051\GIS\Land\_use\_relationships.mxd, 3/26/2007, 1:44 PM, Author: JansieeT



**LAND USE RELATIONSHIPS**

**Figure 2 - 4**

The project lies within the Fresno County portion of the San Joaquin Valley Air Basin (SJV Air Basin). The air quality of the Valley is directly related to the ability of the atmosphere to dilute and transport pollutants. The climate and meteorology within the Valley are conducive to the creation and entrapment of air pollution. Air pollution within the Valley is, in part, a result of the enclosed air basin, which experiences long periods of inversion, a relatively light wind flow, and a generous amount of sunlight. The SJV Air Basin is comprised of eight counties: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and central and western Kern. The Basin periodically exceeds State and/or federal standards for levels of ozone and fine particulate matter.

The natural vegetation communities of the southern San Joaquin Valley historically supported a diverse assemblage of plant and animal species. The conversion of native and naturalized plant communities by agricultural development, road construction, dam construction, and urbanization has significantly reduced available wildlife and plant habitat. As a result of this conversion, several species of both plants and animals have been extirpated from the southern San Joaquin Valley, and populations of other species have declined significantly. As a result, and as directed by State and federal legislation, the California Department of Fish and Game and the United States Fish and Wildlife Service have listed many southern San Joaquin Valley species as threatened, endangered, candidates for state or federal listing, “sensitive species”, “special-status species”, or “species of concern.” The likelihood of their appearance at this site is reduced by the conversion of native vegetation in the project area to intensive agriculture.

The topography of the project area is essentially flat with slopes, prior to agricultural land leveling, averaging five feet to the mile toward the southwest. The Federal Emergency Management Flood Insurance Rate Maps show a small portion of the project area to be in a 100-year flood zone.

The southern San Joaquin Valley, approximately 10,000 square miles, is a broad structural trough bordered by the Sierra Nevadas on the east, the Coastal Ranges on the west and the Transverse Range on the south. The occurrence of groundwater is directly related to the geology and soils in the region. Fresh groundwater is principally contained in the unconsolidated continental deposits of the Pliocene to the Holocene age, which extend to depths ranging from less than 100 to more than 3,000 feet.

The ultimate source of groundwater in the San Joaquin Valley is precipitation on the valley and its tributary drainage basins. Replenishment of the unconfined and semi-confined groundwater bodies can be by seepage from streams and by underflow in permeable materials flooring the river and stream canyons that border the valley.

The groundwater basin in this portion of the San Joaquin Valley is the Tulare Lake Basin which covers the area south of the San Joaquin River and includes Kings County and the western (valley portions) of Fresno, Fresno and Kern Counties.

## 2.6 Environmental Evaluation

<u>Issues:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant With Mitigation Incorporation</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>
<b>2.6.1 AESTHETICS</b> Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or night time views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### **Response**

#### **Visual Compatibility**

[Evaluation Criteria (a), (b), (c)]

The dairy structures, including the milking barn, freestall barns, and feed storage barns, are approximately 30 feet in height; the general design of the existing dairy is consistent with other dairies in the area, and compatible with adjacent farm operations.

**Conclusion:** The dairy facilities are located in an agricultural area characterized by other dairies, agricultural operations and similar structures and facilities. No identified scenic vistas have been blocked by the project facilities. The project does not have an adverse effect on a scenic vista or degrade the existing visual character of the project vicinity.

**Mitigation Measures:** None required.

#### **Light and Glare**

[Evaluation Criteria (d)]

The dairy facilities sites include lighting. The effects of this lighting are a loss of darkness in the night sky that may be noticeable to residents in the area.

**Conclusion:** All lighting is principally under roofs and directed downward and inward to illuminate specific areas. The impact is less than significant.

**Mitigation Measures:** None are required.

**Issues:**

Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
--------------------------------------	--------------------------------------------------------------	------------------------------------	--------------

**2.6.2 AGRICULTURE RESOURCES: - Would the project:**

- |                                                                                                                                                                                                                                                |                          |                          |                          |                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?                                                                                                                                                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use?                                                                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Response:**

**Loss of Farmland**

**[Evaluation Criteria (a)(c)]**

The dairy is an agricultural use; no conversion has been created by the project.

**Conclusion:** The project does not have an adverse impact on farmland.

**Mitigation Measures:** None required.

**Zoning Conflicts**

**[Evaluation Criteria (b)]**

The site is zoned for agricultural use (AE-20). Dairies are permitted under the Fresno County Zoning Ordinance, in the AE-20. The project location complies with the provisions of the County’s Land Use Element which considers a dairy to be an agricultural use consistent with the County’s agricultural land use designation. The site is included in a Williamson Act Agricultural Preserve and the existing dairy usage is consonant with approved uses.

**Conclusion:** The dairy site is in compliance with Fresno County’s land use plans and Zoning Ordinance. There are no environmental impacts involving land use or zoning.

**Mitigation Measures:** None required.

**Issues:**

**2.6.3 AIR QUALITY: Would the project:**

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

***Response:***

Air quality is the principal area of environmental concern with respect to this project which involves no new physical facilities but increases the allowable dairy cow occupancy of existing facilities. Accordingly, the following additional physical and regulatory setting data and discussion are provided, together with a summary tabulation of project air emissions after incorporation in project operations of all the mitigation measures required to reduce impacts to less than significance.

**Setting**

The estimated population within the San Joaquin Valley Air Basin (Air Basin) is more than 3.6 million people, according to SJVAPCD's Planning Division. The Air Basin has one of the most severe air pollution problems in the State. The surrounding topographic features restrict air movement through and out of the basin and, as a result, impede the dispersion of pollutants from the basin. Inversion layers are formed in the Air Basin throughout the year. During the summer, the San Joaquin Valley experiences daytime temperature inversions at elevations from 2,000 to 2,500 feet above the valley floor. During the winter months, inversions occur from 500 to 1,000 feet above the valley floor (Cal. Air Resources Board, 2007).

Although the San Joaquin Valley Air Basin is often in violation of state and federal ozone ambient air quality standards and PM<sub>10</sub> thresholds, data collected over the past ten years by the California Air Resources Board show that air quality in the Valley is, in general, improving. San Joaquin Valley Air Pollution Control (District) has requested and received approval of Federal standard reclassification to 'extreme' nonattainment, which will delay the attainment date to 2024, but results in extremely strict controls for stationary sources of pollutants. The focus of

the current planning effort for the Air Basin is ozone, but it is important to remember that the Air Basin is also classified as nonattainment for the federal PM<sub>2.5</sub> standard. The Air Basin now has a nominal attainment date for the PM<sub>2.5</sub> standard of April 2010, with a maximum extension to 2015. The PM<sub>2.5</sub> attainment plan must be submitted to the EPA by April 2008. Many of the control strategies needed to bring the Air Basin into attainment of federal ozone standard will also provide progress toward attainment of the PM<sub>2.5</sub> standard.

Federal and state laws require emission control measures in areas where air pollution exceeds ambient air quality standards. The San Joaquin Valley is one of these areas. The San Joaquin Valley Unified Air District (District) consists of the following eight counties: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the Valley portion of Kern. The District's primary focus is taking action to improve the health and quality of life of people living in the Valley, while striving to meet health based state and federal ambient air quality standards. This is achieved through adopting and implementing cost-effective air pollution control measures, providing meaningful incentives for reducing emissions, and by developing creative alternatives for achieving emissions reductions. The District's strategies focus on reducing Criteria Pollutants to meet federal and state standards, and regulating stationary source emissions.

**Ambient Air Quality Standards.** Under the federal *Clean Air Act, 42 U.S.D. Section 7401 et. seq. (1970) (as amended 1990)*, the federal government originally established National Ambient Air Quality Standards ("NAAQS") for "criteria" pollutants. Both the U.S. Environmental Protection Agency and the California Air Resources Board have now established ambient air quality standards for such pollutants. These ambient air quality standards are maximum levels of contaminants, which are intended to represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. The air quality criteria pollutants under state and federal law include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM<sub>10</sub>, PM<sub>2.5</sub>, lead, and hydrogen sulfide.

The federal and California state ambient air quality standards are summarized in Table #2.6.3.1. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes are intended to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and PM<sub>10</sub>.

**Table 2.6.3.1  
Federal and State Ambient Air Quality Standards –2007**

<b>Pollutant</b>	<b>Averaging Time</b>	<b>California Standards<sup>a</sup> Concentration<sup>c</sup></b>	<b>Federal Standards<sup>b</sup> Primary<sup>c, d</sup></b>
<b>Ozone</b>	1 Hour	0.09 ppm (180 µg/m <sup>3</sup> )	--
	8 Hour	--	0.08 ppm (157 µg/m <sup>3</sup> ) <sup>e</sup>
<b>Respirable Particulate Matter (PM<sub>10</sub>)</b>	24 Hour	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>
	Annual Arithmetic Mean	20 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
<b>Fine Particulate Matter (PM<sub>2.5</sub>)</b>	24 Hour	65 µg/m <sup>3</sup>	65 µg/m <sup>3</sup>
	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>
<b>Carbon Monoxide (CO)</b>	8 Hour	9.0 ppm (10 µg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )
	1 Hour	20 ppm (23 mg/m <sup>3</sup> )	35 ppm (40 mg/m <sup>3</sup> )
	8 Hour (Lake Tahoe)	6 ppm (7 µg/m <sup>3</sup> )	--
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	Annual Arithmetic Mean	--	0.053 ppm (100 µg/m <sup>3</sup> )
	1 Hour	0.25 ppm (470 µg/m <sup>3</sup> )	--
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>	Annual Arithmetic Mean	--	0.030 ppm (80 µg/m <sup>3</sup> )
	24 Hour	0.04 ppm (105 µg/m <sup>3</sup> )	0.14 ppm (365 µg/m <sup>3</sup> )
	1 Hour	0.25 ppm (655 µg/m <sup>3</sup> )	--
<b>Lead</b>	30 Day Average	1.5 µg/m <sup>3</sup>	--
	Calendar Quarter	--	1.5 µg/m <sup>3</sup>
<b>Visibility Reducing Particles</b>	8 Hour	f	--
<b>Sulfates</b>	24 Hour	25 µg/m <sup>3</sup>	--
<b>Hydrogen Sulfide</b>	1 Hour	0.03 ppm (42 µg/m <sup>3</sup> )	--
<b>Vinyl Chloride</b>	24 Hour	0.010 ppm (26 µg/m <sup>3</sup> )	--

<sup>a</sup> California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide ( 1 and 24 hour), nitrogen dioxide, suspended particulate matter – PM<sub>10</sub>, PM<sub>2.5</sub> , and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

<sup>b</sup> National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM<sub>10</sub>, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m<sup>3</sup> is equal to or less than one. For PM<sub>2.5</sub> , the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

<sup>c</sup> Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

<sup>d</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

<sup>e</sup> New federal 8-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18, 1997.

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

The U.S. Environmental Protection Agency in 1997 adopted new national air quality standards for ground-level ozone and for fine Particulate Matter. The existing one-hour ozone standard of 0.12 PPM was phased out and replaced by an eight-hour standard of 0.08 PPM. New national standards for fine Particulate Matter (diameter 2.5 microns or less) have also been established for 24-hour and annual averaging periods. The current PM<sub>10</sub> standards were retained, but the method and form for determining compliance with the standards were revised. Additionally, a PM<sub>2.5</sub> state standard was adopted effective July 5, 2003. The San Joaquin Valley is non-attainment for both the State and Federal PM<sub>2.5</sub> standards.

Recent concerns over global warming have created a greater interest in greenhouse gases (GHG) and their contribution to global climate change (GCC). However, at this time there are no generally accepted thresholds of significance for determining the impact of GHG emissions from an individual project on GCC. Thus, permitting agencies are in the position of developing policy and guidance to ascertain and mitigate to the extent feasible the effects of GHG, for CEQA purposes, without the normal degree of accepted guidance and case law.

**Greenhouse Gases.** Gases that trap heat in the atmosphere are called greenhouse gases; they act in the atmosphere in a manner analogous to the way a greenhouse retains heat. Common GHG include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Without the natural heat trapping effect of GHG, the earth's surface would be about 34 degrees Centigrade cooler (Climate Action Team, 2006). Natural processes and human activities are primarily responsible for the emission of GHG. Green house gases include:

Water Vapor: Although not considered a pollutant, water vapor is the most important, abundant, and variable GHG. In the atmosphere, it maintains a climate necessary for life. The main source of water vapor is evaporation from the ocean (approximately 85 percent). Other sources include sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves.

Ozone: Unlike other GHG, ozone is relatively short-lived and, therefore, is not global in nature. It is difficult to make an accurate determination of the contribution of ozone precursors (nitrogen oxides and volatile organic compounds) to global climate change (California Air Resources Board (CARB) 2004b).

Aerosols: Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light. Cloud formation can also be affected by aerosols. Sulfate aerosols are emitted when fuel-containing sulfur is burned. Black carbon (or soot) is emitted during bio mass burning or incomplete combustion of fossil fuels. Particulate matter regulation has been lowering aerosol concentrations in the United States; however, global concentrations are likely increasing.

Carbon dioxide: Carbon dioxide (CO<sub>2</sub>) is an odorless, colorless gas, which has both natural and anthropogenic sources. Natural sources include the following: respiration of bacteria, plants, animals, and fungus, evaporation from oceans, volcanic outgassing, and decomposition of dead

organic matter. Anthropogenic sources of carbon dioxide are from burning coal, oil, natural gas, and wood. Concentrations of CO<sub>2</sub> were 379 parts per million (ppm) in 2005, which is an increase of 1.4 ppm per year since 1960 (Intergovernmental Panel on Climate Change 2007).

Methane: Methane (CH<sub>4</sub>) is a flammable gas and is the main component of natural gas. When one molecule of CH<sub>4</sub> is burned in the presence of oxygen, one molecule of carbon dioxide and two molecules of water are released. There are no ill health effects from CH<sub>4</sub>. A natural source of CH<sub>4</sub> is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain CH<sub>4</sub>, which is extracted for fuel. Other sources are from cattle, fermentation of manure, and landfills.

Nitrous oxide: Nitrous oxide (N<sub>2</sub>O), also known as laughing gas, is a colorless greenhouse gas. Higher concentrations of N<sub>2</sub>O can cause euphoria, dizziness, and slight hallucinations. N<sub>2</sub>O is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (nitric acid production, nylon production, fossil fuel-fired power plants, and vehicle emissions) also contribute to its atmospheric load. It is used in racecars, rocket engines, and as an aerosol spray propellant.

Chlorofluorocarbons: Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in CH<sub>4</sub> or ethane with chlorine and/or fluorine atoms. CFCs are nonflammable, nontoxic, insoluble, and chemically uncreative in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as cleaning solvents, refrigerants, and aerosol propellants. They destroy stratospheric ozone; therefore, their production was stopped as required by the Montreal Protocol in 1987.

Hydrofluorocarbons: Hydrofluorocarbons (HFCs) are synthetic man-made chemicals that are used as a substitute for CFCs for automobile air conditioners and refrigerants.

Perfluorocarbons: Perfluorocarbons (PFCs) have stable molecular structures and do not break down though the chemical processes in the lower atmosphere. High-energy ultraviolet rays, roughly 60 kilometers above the earth's surface are able to destroy the compounds. PFCs have long lifetimes, ranging between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane and hexafluoroethane. Concentrations of tetrafluoromethane in the atmosphere are over 70 parts per trillion (ppt) (Environmental Protection Agency (EPA) 2006d). The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

Sulfur hexafluoride: Sulfur hexafluoride (SF<sub>6</sub>) is an inorganic, colorless, odorless, nontoxic, nonflammable gas. Concentrations in the 1990s were roughly 4 ppt (EPA 2006d). SF<sub>6</sub> is used for insulation in electric power transmission and distribution equipment, in semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.

**Worldwide Greenhouse Gas Inventory.** In 2004, total worldwide GHG emissions were estimated to be 20,135 teragram CO<sub>2</sub> equivalents (Tg CO<sub>2</sub> Eq.) (22,194,810,000 tons), excluding emissions/removals from land use, land use change, and forestry (United Nations Framework Convention on Climate Change 2006). (Note that sinks, or GHG removal processes, plays an

important role in the GHG inventory as forest and other land uses absorb carbon.) In 2004, U.S. GHG emissions were 7,074.4 Tg CO<sub>2</sub> Eq. (7,798,111,120 tons) (EPA 2006a). In 2005, total U.S. GHG emissions were 7,260.4 Tg CO<sub>2</sub> Eq. (8,003,138,920 tons), a 16.3 increase from 1990 emissions, while U.S. gross domestic product increased by 55 percent over the same period (EPA 2007a). Emissions rose from 2004 to 2005, an increase of 0.8 percent. Factors causing the increase are the following: (1) strong economic growth in 2005, leading to increased demand for electricity and (2) an increase in the demand for electricity due to warmer summer conditions (EPA 2007a). However, a decrease in demand for fuels due to warmer winter conditions and higher fuel prices moderated the increase in emissions (EPA 2007a). California is a substantial contributor of GHG as it is the second largest contributor in the U.S. and the sixteenth largest in the world (California Energy Commission (CEC) 2006). In 2004, California produced 492 Tg CO<sub>2</sub> Eq. . (542,331,600 tons) (CEC 2006), which is approximately seven percent of U.S. emissions. The major source of GHG in California is transportation, contributing 41 percent of the State's total GHG emissions (CEC 2006). Electricity generation is the second largest source, contributing 22 percent of the State's GHG emissions.

**Global Climate Changes.** Global climate change (GCC), which most scientists believe is caused by GHG emissions, is a widely discussed economic, political, and scientific issue in the United States. GCC is a change in the average weather of the earth that may be measured by changes in temperature, precipitation, storms, and wind. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. Many recent concerns over GCC utilize this data to extrapolate a level of statistical significance specifically focusing on temperature records from the past 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

**Key Legislation and Policies.** The Global warming Solutions Act of 2006, also known as Assembly Bill 32 (AB 32), was signed into law on September 27, 2006. AB 32 requires the California Resources Board (CARB) to do the following:

- By July 1, 2007, adopt a list of early action measures that can be implemented by regulation before January 2010.
- By January 1, 2008, adopt mandatory reporting requirements for significant sources.
- By January 1, 2008, establish a statewide GHG emission cap for 2020 based upon 1990 emissions levels.
- By January 1, 2009, adopt a scoping plan indicating how emission reductions will be achieved for significant GHG sources via regulations, market mechanisms, or other measures.
- By January 1, 2011, adopt regulations to achieve the maximum technologically feasible and cost effective reductions in GHG.

**Thresholds of Significance.** There are no widely accepted published thresholds of significance for determining the impact of GHG emissions from an individual project, or from a cumulative perspective, on GCC. Without established guidelines or thresholds of significance, characterizing GHG impacts and implementing feasible and cost effective GHG emission reduction measures for an individual project is speculative. However, the following is a discussion of the subject project's potential GHG emissions and mitigations.

**Bar 20 Project's Potential GHG Emissions.** Currently, GHG emissions produced by dairy projects, and the impact they have on GCC, is a topic of significant scientific research and debate. Given today's knowledge, there is no way a dairy project would have an individually discernable effect on global climate change, i.e. that any increase in global temperature or sea level could be attributed to the emissions resulting from a single dairy. While an individual dairy's GHG emissions may not have a measurable effect on GCC, when combined with all other sources of GHG emissions, dairies may contribute to the cumulative impact on GCC.

**Regional Air Quality Plans.** Federal and state air quality laws require identification of areas not meeting the ambient air quality standards. These areas must develop regional air quality plans to eventually attain the standards. Under both the federal and state Clean Air Acts the San Joaquin Valley Air Basin is a non-attainment area (standards have not been attained) for ozone, PM<sub>10</sub> and PM<sub>2.5</sub>. The air basin is either attainment or unclassified for other ambient standards.

The Basin is currently serious non-attainment for PM<sub>10</sub> and for 8-hour ozone (the previous extreme non-attainment for 1-hour ozone has been revoked by the US EPA effective June 15, 2005 as specified in Federal Register VO. 69 No. 84 Friday April 30, 2004 Rules and Regulations). The District has prepared its *2007 Ozone Plan* which will be heard by the District Governing Board April 30, 2007. Once the plan is adopted the District will be reclassified to an 'extreme' attainment status for ozone. Under the *2007 Ozone Plan*, all proposed local measures will be adopted by the SJVAPCD before 2012. Additional measures requiring technology advancement or new incentive funding will also be adopted and implemented as expeditiously as they become available. By 2015 over 50% of the Valley's population will reside in areas meeting the federal ozone standard. By 2020, this percentage will increase to 90% with the area east of Arvin and in Northwest Fresno remaining. It is expected that further advancements in technology occurring after 2020 but no later than 2023 will bring these areas into compliance as well.

The attainment deadline for PM<sub>10</sub> is 2010; however, the SJVAPCD recently submitted a request to the EPA to reclassify the area as in attainment for PM<sub>10</sub>. In order to meet the standard, the District had to provide three years of data showing that PM<sub>10</sub> concentrations did not exceed 24-hour and annual caps. The EPA's declaration of attainment for PM<sub>10</sub> was the final step in reaching this milestone. Since 1990, emissions of PM<sub>10</sub> and its precursors have dropped 36 percent as a result of the commitments undertaken by the Air District and the Valley's businesses, citizens and local governments. In October 2007, the EPA found that the SJVAB had shown continued attainment of the 24-hour and annual PM<sub>10</sub> national ambient air quality standards (Federal Register Vol. 71, No. 209). The designation and classification status remains nonattainment for the SJVAB until such time as California has an approved maintenance plan as required under section 175(A) of the CAA. When such a plan is approved by the EPA, the SJVAB will be redesignated as in attainment for PM<sub>10</sub>. Currently there is no established timeframe for this action.

The SJVAPCD is in the process of preparing a PM<sub>2.5</sub> SIP for submittal to the EPA by April 2008. The air quality science indicated that reductions of nitrogen oxides (NO<sub>x</sub>) are relatively more beneficial for both ozone and PM<sub>2.5</sub> attainment than other contributing pollutants. The

SJVAB ozone SIP is designed with this in mind and when the PM<sub>2.5</sub> plan is complete, the District will review the ozone strategy to ensure this is the case.

**Summary of SJVAPCD Rules and Processes Applicable to Project.** The SJVAPCD has indicated that the following are among those applicable:

- Regulation VIII, Fugitive PM<sub>10</sub> Prohibitions, has been adopted by the District to reduce the amount of particulate matter entrained into the ambient air from man-made sources (See Table #2.6.3.2).
- Rule 4550, Conservation Management Practices (CMP). This program reduces fugitive dust from agricultural operations. The rule requires the preparation of a CMP Plan that must be submitted to the District.
- Rule 4570, Confined Animal Facilities (CAF). The program limits emissions of volatile organic compounds (VOC) from Confined Animal Facilities.
- An operation of this size is subject, under Rule 2201, to the District’s Permit to Operate requirements. This project is subject to Best Available Control Technology (BACT).

**Table 2.6.3.2  
Summary of Rules Comprising Regulation VIII  
of the San Joaquin Valley Air Pollution Control District**

<b>Rule Number</b>	<b>Title and Brief Summary</b>
<b>8010</b>	<b>Fugitive Dust Administrative Requirements for Control of Fine Particulate Matter (PM<sub>10</sub>)</b> – The purpose of Regulation VIII is to reduce the amount of PM <sub>10</sub> entrained in the ambient air as a result of emissions generated from man-made fugitive dust sources by requiring actions to prevent, reduce, or mitigate PM <sub>10</sub> emissions. The Rules contained in this regulation are required to reduce PM <sub>10</sub> emissions which violate the National Ambient Air Quality Standards for PM <sub>10</sub> and implement control measures contained in the District PM <sub>10</sub> Nonattainment Area State Implementation Plan.
<b>8011</b>	<b>General Requirements</b> – Sets forth the definitions, exemptions, requirements, administrative requirements, recordkeeping requirements, and test methods applicable to all Rules under Regulation VIII.
<b>8020</b>	<b>Fugitive Dust Requirements for Control of Fine Particulate Matter (PM<sub>10</sub>) from Construction, Demolition, Excavation and Extraction Activities</b> – Purpose is to limit fugitive dust emissions from construction, demolition, excavation, and related activities. Rule shall remain in effect until April 2002 or until the effective date of Rule 8021 whichever occurs later.
<b>8021</b>	<b>Construction, Demolition, Excavation, Extraction, and other Earthmoving Activities</b> – Applies to any construction, demolition, excavation, extraction, and other earthmoving activities, including, but not limited to, land clearing, grubbing, scraping, travel on site, and travel on access roads to and from the site.
<b>8030</b>	<b>Fugitive Dust Requirements for Control of Fine Particulate Matter (PM<sub>10</sub>) from Bulk Materials</b> – Purpose is to limit outdoor handling and storage of any bulk material which emits visible dust when stored or handled. Rule to remain in effect until April 2002 or until the effective date of Rule 8031.
<b>8031</b>	<b>Bulk Materials</b> – Applies to outdoor handling, storage and transport of any bulk material.

**Table 2.6.3.2, Summary of Rules (continued)**

<b>Rule Number</b>	<b>Title and Brief Summary</b>
<b>8040</b>	<b>Fugitive Dust Requirements for Control of Fine Particulate Matter (PM<sub>10</sub>) from Landfill Disposal Sites</b> – Applies to all operational landfill disposal sites.
<b>8041</b>	<b>Carryout and Trackout</b> – Applies to all sites that are subject to any of the following rules where carryout or trackout has occurred or may occur on paved public roads of the paved shoulders of a paved public road: Rules 8021, 8031, 8061, 8071.
<b>8051</b>	<b>Open Areas</b> – Applies to any open area having 0.5 acre or more within urban areas, or 3.0 acres or more within rural areas; and contains at least 1,000 square feet of disturbed surface area.
<b>8060</b>	<b>Fugitive Dust Requirements for Control of Fine Particulate Matter (PM<sub>10</sub>) from Paved and Unpaved Roads</b> – Purpose is to limit dust from any paved, or unpaved public or private road, street highway, freeway, alley, access drive, access easement, or driveway constructed or modified after December 1993. Rule shall remain in effect until April 2002 or until the effective date of Rule 8061.
<b>8061</b>	<b>Paved and Unpaved Roads</b> – Applies to any new or existing public or private paved or unpaved road, road construction project, or road modification project.
<b>8070</b>	<b>Fugitive Dust Requirements for Control of Fine Particulate Matter (PM<sub>10</sub>) from Vehicle and/or Equipment Parking, Shipping, Receiving, Transfer, Fueling and Service Areas</b> – Purpose is to limit dust from all unpaved areas of one acre or larger. Rule effective until effective date of Rule 8071.
<b>8071</b>	<b>Unpaved Vehicle/Equipment Traffic Areas</b> – Applies to any unpaved vehicle/equipment traffic area.
<b>8081</b>	<b>Agricultural Sources</b> – Applies to off-field agricultural sources.

Currently, there is no final BACT guideline for dairy operations. The SJVAPCD must perform a detailed “Top-Down” BACT analysis for VOC, PM<sub>10</sub>, H<sub>2</sub>S and NH<sub>3</sub> as part of its evaluation of the dairy’s Authority to Construct (ATC) application. This analysis entails a listing of all available control technologies, in order of lowest emissions. Each control technology is evaluated, starting with the cleanest (lowest emission), to see if it is cost effective to install on a given dairy. In other words, the District will first review the lowest VOC, PM<sub>10</sub>, H<sub>2</sub>S and NH<sub>3</sub> technologies available in today’s market and, if not cost effective, then looks at the next cleanest technologies. This continues until the District finds a technology that is cost effective or until the project reaches an emissions level that the District considers “achieved-in-practice.”

The 1990 Federal Clean Air Act Amendment (CAAA) included a Federal permitting program for “major” sources of emissions. In the San Joaquin Valley, this now includes any facility with more than 10 tons per year of ozone precursors (NO<sub>x</sub> and VOC). This was presented in Title V of the CAAA and was thus called “Title V Permitting”. CARB and EPA have reached an agreement regarding removal of Title V Agricultural exemptions. One of EPA’s conditions was the California Legislature’s revision of the Health and Safety Code to eliminate the provision that exempts “any animals” from the requirement to obtain a permit. All local Districts modified their permitting system appropriately. Sources that may require permits include facilities with stationary diesel engines and concentrated animal feeding operations. Applicability of the Title V permit program depends on where sources are located, and the air quality rating of that area. EPA has not as yet established, other than Title V regulations, air quality requirements for dairies, thus further emphasizing the current difficulty in scientifically determining appropriate limits on dairy emissions.

The agricultural exemption is now repealed pursuant to SB 700 (Florez), and the applicant must comply with the adopted regulations by the SJVAPCD and obtain necessary air quality permits from the APCD, or any other area-responsible air quality regulatory authority. The SJVAPCD adopted Rules 3190 and 4550 in 2004 for PM<sub>10</sub> conservation management fees and for implementation of selected PM<sub>10</sub> reduction programs for agricultural operations. The project applicant must comply with these rules..

**Regulatory Framework.** The California Air Resources Board (CARB) is responsible for enforcing the federally required State Implementation Plan (SIP) in an effort to achieve and maintain the national ambient air quality standards. SIP is the plan prepared by states and submitted to U.S. EPA describing how each federal nonattainment area will attain and maintain national ambient standards. SIPs include the technical foundation for understanding the air quality (e.g. emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms. The SIP incorporates the individual nonattainment plans for air quality districts. In addition, CARB has established State Ambient Air Quality Standards for the Federal “criteria” pollutants as well as for other pollutants for which there are no corresponding Federal standards. CARB is responsible for determining air basin attainment designations in California, and has the authority over mobile sources of pollutants.

The SJVAPCD, as the local air quality agency, is responsible for preparing regional air quality plans under the state and federal Clean Air Acts. The District’s boundaries are contiguous with the San Joaquin Valley Air Basin. In addition to planning responsibilities, SJVAPCD has permitting authority over stationary sources of pollutants such as power plants and manufacturing facilities as well as some area sources such as agricultural operations. The State Health and Safety Code exempted agricultural and livestock operations from local air districts’ permitting regulations (Section 42310), opacity limits from plumes (Section 41704), and odor nuisance (Section 41705). Thus, the District’s authority with respect to such operations was limited to review of CEQA documents, enforcement in nuisance situations, and identification of significant thresholds.

The San Joaquin Valley *PM<sub>10</sub> Attainment Demonstration Plan* (PM<sub>10</sub> ADP) acknowledges that agricultural activities may represent a significant source of fugitive dust and supports continued research to characterize emissions from these activities. The PM<sub>10</sub> ADP addressed control of particulate emissions from agricultural operations by implementation of voluntary “agricultural conservation practices”. Certain aspects of the operation of dairies are covered by revised Regulation VIII PM<sub>10</sub> requirements.

The SJVAPCD’s 2004 Extreme Ozone Attainment Demonstration Plan (EOADP), included control measure Rule 4570. Concentrated Animal Feeding Operations. This rule is intended to control volatile organic compounds (VOC’s), which are precursors to ozone from confined animal facility operations (CAFO). This plan was submitted by ARB as part of the State Implementation Plan. This control measure was effective July 1, 2006. Rule 4570 is also intended to meet the requirements of SB 700, which amended sections of the California Health and Safety Code, specifically CH&SC Section 40724.6 (b), to require air districts which are designated as federal nonattainment areas for ozone to adopt, implement, and submit for inclusion in the State Implementation Plan a rule or regulation requiring CAFO’s to obtain a

permit from the District and to reduce, to the extent feasible, emissions of air contaminants from the facilities. This control measure applies to all new and existing dairies which have or will have VOC emissions greater than 1,000 milk cows and will require Best Available Retrofit Control Technologies, outlined in the rule.

**Impact #2.6.3.1 Operational Emissions of Greenhouse Gases  
[Evaluation Criteria (a), (b), (c), (d)]**

The lack of validated scientific information on dairy emissions results in uncertainty in characterizing the project’s GHG emissions and their impact on GCC. However, the District has quantified the operational GHG emissions from the Bar 20 project using the available scientific methodology and information. Using CARB’s emissions factors, the operational emissions of CH<sub>4</sub> and N<sub>2</sub>O from the project are presented in the table below:

**Table 2.6.3.3  
Greenhouse Gas Emissions from Bar 20 Dairy**

<b>Pollutant</b>	<b>Pre-Project emissions tons/year</b>	<b>Post-Project emissions tons/year*<sup>1</sup></b>	<b>Reductions from shutting down existing dairies tons/year</b>	<b>Increase in GHG emissions tons/year*<sup>2</sup></b>
Methane (CH <sub>4</sub> )	2,435.8	3,759.9	(520.0)	804.1
CO <sub>2</sub> Equivalents	51,152.3	78,956.9	(10,920.0)	16,886.1
Nitrous Oxide (N <sub>2</sub> O)	14.4	16.0	0.2	1.8
CO <sub>2</sub> Equivalents	4,471.9	4,969.4	62.0	558.0
CO <sub>2</sub> Equivalents (Total)	55,624.2	83,926.3	(10,858.0)	17,444.1

\*1 Includes reductions mentioned below: feeding to NRC guidelines, weekly scraping, and land-application of solid manure.

\*2 CH<sub>4</sub> Increase is calculated: 3,759.9 – 2,435.8 – 308.6 = 1,015.5.

The calculations for this table are found in Appendix “A” of this document. Given the uncertainty discussed above, these estimates may significantly under- or overstate actual project emission’s impact on GCC. Furthermore, CO<sub>2</sub> emissions were not quantified for this project due to the fact that a credible emission factor for CO<sub>2</sub> has not been established by CARB.

The District has statutory authority over the project via its Permits Required Rule (Rule 2010) and New Source Review Rule (Rule 2201). Pursuant to these rules, the District can impose mitigation measures limiting the project’s emissions of criteria pollutants. The District has imposed mitigation measures on the Bar 20 project to reduce Volatile Organic Compounds (VOC) emissions. Certain mitigation measures imposed on the Bar 20 project will also contribute to the reduction of GHG emissions. These measures are the following:

**Mitigation Measure #2.6.3.1-1 Reduction of Greenhouse Gas Emissions (quantifiable):**

1. All animals fed in accordance with National Research Council (NRC) or other District-approved guidelines utilizing routine nutritional analysis for rations.

Explanation: Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The requirement to feed in accordance with The NRC guidelines has the potential for reducing VOC and NH<sub>3</sub> emissions by reducing the quantity of undigested nutrients in the manure. Many of these emissions originate from the decomposition of undigested protein in animal waste.<sup>1</sup> 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 NH<sub>3</sub> and VOCs. Nutritional management has also been shown to impact CH<sub>4</sub> production. Data is available demonstrating that a change in diet by feeding various types of feed can in fact reduce CH<sub>4</sub> emissions. However, the effects these feeds have on VOC and NH<sub>3</sub> emissions is not available. Since these impacts are not known, these various feedstuffs will not be required as part of this evaluation. However, it will be assumed that by feeding in accordance with the NRC guidelines alone, CH<sub>4</sub> reductions will be achieved by reducing the amount of undigested proteins in the manure, thus decreasing microbial activity. Because of limited research, feeding dairy animals in accordance with National Research Council (NRC) will be given the same control efficiency of 5% for methane as was given for VOC control.

2. Weekly scraping of freestall exercise pens and open corrals using a pull-type scraper in the morning hours except when prevented by wet conditions. Cover dry animal waste piles outside the pens with a weatherproof covering from October through May, except for times, not to exceed 24 hours per event, when wind events remove the covering.

Explanation: The primary purpose of weekly removal of manure and covering the manure piles was to reduce PM<sub>10</sub> emissions and VOC emissions from the decomposition of manure in the corrals. However, based on a news alert issued by *Science for Environment Policy*, frequent removal of manure and covering the stored manure piles was also found to reduce GHG emissions by up to 7.1%

3. Solid manure applied to fields shall be incorporated into the soil immediately (within two hours) after application.

Explanation: A report entitled “*Recommendations to the San Joaquin valley Air Pollution Control Officer Regarding Best Available Control Technology for Dairies in the San Joaquin Valley*” by the Dairy Permitting Advisory Group (DPAG) provided a VOC control efficiency of incorporating manure into the soil in the range of 29-58%. CH<sub>4</sub> emissions will also be assumed to be reduced similarly to VOC due to the organic content of both pollutants, however due to the lack of data, the lower control efficiency of 29% will be used.

**Effectiveness of Measures:** 1. Feeding animals in accordance with the NRC guidelines will result in a reduction of approximately 203.3 tons of CH<sub>4</sub>/year (4,269.3 tons of CO<sub>2</sub> equivalent) from the project. 2. This will result in a potential reduction in emissions of approximately 28.1 tons of CH<sub>4</sub>/year (590.1 tons of CO<sub>2</sub> equivalent) from the project. 3. This measure will result in

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<sup>1</sup> “Emissions of Volatile Organic Compounds Originating from UK Livestock Agriculture”, Hobbs, P.J. 2004 – Journal of the Science of Food and Agriculture

a potential reduction in emissions of approximately 76.0 tons of CH<sub>4</sub>/year (1,596 tons of CO<sub>2</sub> equivalent) from the project.

### **Mitigation Measure #2.6.3.1-2 Reduction of Greenhouse Gas Emissions (non-quantifiable):**

1. Downwind windbreak designed in accordance to the NRCS guideline #380

Explanation: Plants are nature's CO<sub>2</sub> sinks, meaning, through photosynthesis, plants remove or sequester carbon from the atmosphere. Bar 20 dairy has proposed to install windbreaks at their facility (a 3-row windbreak, consisting of hundreds of trees and shrubs). Although the primary purpose of the windbreaks is to reduce the PM<sub>10</sub> from the facility, it will also serve as a medium for removal of CO<sub>2</sub> from the facility or the surrounding environment. Generally a large number of trees are required in order to be considered effective in reducing CO<sub>2</sub> emissions. Although this windbreak is expected to result in some GHG reduction, the extent of the reductions cannot be quantified at this time.

2. All open corrals adequately sloped to promote drainage (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.)
3. Maintain corrals to ensure drainage and prevent water from standing more than 48 hours after a storm.
4. Knockdown fence line animal waste build-up prior to it exceeding a height of 12 inches at any time or point.

**Effectiveness of Measures:** The purpose of the above mitigation measures is to reduce anaerobic decomposition, which takes place inside of the corrals. The byproducts of anaerobic decomposition are primarily CH<sub>4</sub> and CO<sub>2</sub> emissions with secondary pollutants consisting of VOC, NH<sub>3</sub>, and sulfur compounds. Although a significant amount of GHG emissions can potentially be reduced through these measures, the amount cannot be quantified at this time due to lack of data.

### **VOC Mitigation Measures that were evaluated but are not feasible for the project:**

- Measure: Freestall Enclosure and vent biogas to a control device such as an incinerator or a biofilter.

Explanation: Freestall enclosures with the biogas vented to a control device such as an incinerator or a biofilter has the potential of reducing a significant amount of CH<sub>4</sub> emissions. Freestall enclosures were evaluated as part of the District's BACT analysis for the purposes of reducing VOC emissions. The BACT analysis found these enclosures not to be cost effective and therefore removed them from consideration as a feasible control technology.

- Measure: Aerobic Treatment Lagoon – mechanical aeration to achieve a dissolved oxygen concentration of 2.0 mg/L.

Explanation: An aerobic treatment lagoon is a waste treatment lagoon that is designed to facilitate the decomposition of wastewater by microbes in the presence of oxygen (O<sub>2</sub>). The process of aerobic decomposition results in the conversion of organic compounds in the wastewater into carbon dioxide (CO<sub>2</sub>), and (H<sub>2</sub>O), nitrates, sulphates, and inert biomass (sludge). The process of aerobic digestion is sometimes referred to as nitrification (especially when discussing NH<sub>3</sub> transformation). Complete aerobic digestion (100% aeration) removes nearly all malodors and also virtually eliminates VOCs, H<sub>2</sub>S, CH<sub>4</sub>, and NH<sub>3</sub> emissions from liquid waste.

Sufficient oxygen must be provided to sustain the aerobic microorganisms in completely aerated lagoons. Lagoons can be considered completely aerobic if sufficient oxygen is provided to achieve a dissolved oxygen (DO) content of 2.0 mg/L or more. Oxygen is typically provided by mechanical aerators. A major disadvantage of completely aerated lagoons is the enormous cost of the energy required to run the aerators continuously. The District performed a cost effective analysis for the purposes of reducing VOC emissions. Because of the large costs, it was determined that completely aerated lagoons are not cost effective options for dairy facilities at the present time.

- Measure: Anaerobic Digester

Explanation: An anaerobic digester is an enclosed basin or tank that is designed to facilitate the decomposition of wastewater by microbes in the absence of oxygen. The process of anaerobic decomposition results in the preferential conversion of organic compounds in the wastewater into methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), and water rather than intermediate metabolites (VOCs). The gas generated by this process is known as biogas, waste gas or digester gas. In addition to CH<sub>4</sub> and CO<sub>2</sub>, biogas also contains small amounts of Nitrogen (N<sub>2</sub>), Oxygen (O<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), and Ammonia (NH<sub>3</sub>). Biogas will also include trace amounts of various Volatile Organic Compounds (VOCs) that remain from incomplete digestion of the volatile solids in the incoming wastewater. Because biogas is mostly composed of methane, the main component of natural gas, the gas produced in the digester can be cleaned to remove H<sub>2</sub>S and other impurities and used as a fuel. The captured biogas can be sent to a natural gas pipeline, used by fuel cells, or combusted in a IC engine, microturbine, flare, or a boiler, where the gas can be used to generate useful heat or electrical energy.

As stated above, the gas generated in the covered lagoon can be captured and then sent to a suitable combustion device. Combustion (thermal incineration) is a generally accepted, well-established VOC control technique. During combustion, gaseous hydrocarbons are oxidized to form CO<sub>2</sub> and water. The VOCs emitted from the liquid manure in the covered lagoon can be reduced by 95% with the use of an appropriate combustion device. Therefore, installation of the digester will lower the total VOCs and methane emitted from the liquid manure from the liquid manure handling system. The control efficiency for CH<sub>4</sub> captured is expected to be 95% or more.

There are drawbacks to anaerobic digesters related to air quality. One of the main drawbacks that can result from anaerobic digestion is the emission of other pollutants resulting from the combustion of biogas. These pollutants include oxides of nitrogen (NO<sub>x</sub>), sulfur oxides

(SO<sub>x</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) and carbon monoxide (CO). Oxides of nitrogen react with VOCs to produce ground-level ozone. Current air quality modeling has demonstrated that the high levels of biogenic and anthropogenic VOC emissions in the San Joaquin Valley Air Basin cause NO<sub>x</sub> to be the limiting reactant for ozone production. Therefore, in terms of ozone production, large reductions in VOC and CH<sub>4</sub> emissions can be offset by relatively smaller increases in NO<sub>x</sub> emissions. The District will consider this factor when determining if anaerobic digesters will reduce ozone formation in the San Joaquin Valley Air Basin. Therefore, the District will err on the side of public health in making this determination, and will not require a combustion technology that reduces GHG, but increases ozone concentrations in the Valley.

However, Bar 20 recently applied for an application to install an anaerobic digester system with the biogas injected to a natural gas pipeline. This proposal is being processed under a separate project (project #C-1073608). Because the majority of the biogas, which consists of CH<sub>4</sub>, will go directly into a natural gas pipeline, rather than into the atmosphere, a significant amount of methane reductions are expected from this project. In addition, since little or no combustion is expected from such processes, no collateral increase in NO<sub>x</sub> is expected. The estimated methane reduction from this project is approximately 1,500 tons of CH<sub>4</sub> per year (31,500 tons-CO<sub>2</sub>/yr equivalents), which should mitigate all of the increase in GHG emissions from this project.

#### **Proposed VOC Mitigation Measures, which increase Methane emissions:**

Certain mitigation measures imposed on the Bar 20 project to reduce criteria pollutants will contribute to an increase in GHG emissions. However, the District's primary mandate of improving the health and quality of life of people living in the Valley, and striving to meet health based state and federal ambient air quality standards, takes precedence over reducing GHG emissions. One such measure that the District is aware of is the following:

- Measure: Lagoon system designed in accordance with the NRCS Conservation Practice Standard Code 359 - Waste Treatment Lagoon.

Explanation: 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 (VOCs). Although this type of system promotes and increases CH<sub>4</sub> emissions, the District's primary concern is to improve public health by reducing the formation of ozone. Therefore, the District will err on the side of public health by realizing the VOC reductions from the project.

**Conclusion:** The Bar 20 project will result in GHG emissions. However, mitigation measures have been incorporated into the project that will reduce GHG emissions. As discussed above, the reduction in GHG emissions from several measures is quantifiable, while additional reductions may result from other measures whose reductions are not quantifiable with the available science. The proposed measures that will result in quantifiable GHG emission reductions are identified below:

- All animals fed in accordance with NRC or other District-approved guidelines,
- Weekly scraping, and
- Solid manure applied to fields incorporated within two hours into the soil.

The reductions achieved through these measures will reduce CH<sub>4</sub> emissions by 307.4 tons/year (6,455.4 tons of CO<sub>2</sub> equivalents).

Given the overwhelming scope of global climatic change, it is not anticipated that the Bar 20 dairy project would have an individually discernable effect on global climate change. In fact, if the proposal to inject the dairies biogas into the natural gas transmission system proves feasible, it should mitigate all quantified GHG emissions increases from the project. Mitigation measures currently known to be feasible are being implemented to the extent to which they do not interfere with the District’s primary mandate to protect the health of the residents of the San Joaquin Valley by controlling ground-level pollution.

**Impact #2.6.3.2 Operational Emission of Criteria Pollutants, Particulate Matter (PM<sub>10</sub>)**  
**[Evaluation Criteria (a), (b), (c), (d)]**

The Bar 20 dairy is currently permitted for an existing dairy facility with the following herd breakdown:

**Existing Bar 20 Dairy Herd**

Type	Number
Milking Cows	2,904
Dry Cows	443
Heifers (15-24 months)	276
Heifers (7-14 months)	1,553
Heifers (4-6 months)	421
Calves (under 3 months)	606
Bull	1
<b>Total dairy herd</b>	<b>6,204</b>

The project is the expansion of dairy operations by housing the following number of cows in a recently constructed dairy facility located to the south across Whites Bridge Road (see Figure 2-3 for location).

### Expanded Dairy Facility Herd Size

Type	Number
Milking cows – freestalls	6,600
Milk cows – Saudi style barns	200
Dry cows – Saudi style barn	1,000
Heifers (15-24 months) open corrals	950
Heifers (15-24 months) open corrals w/shades	950
Heifers (15-24 months) Saudi style barns	300
Heifers (7-14 months) open corrals	750
Heifers (7-14 months) shades	950
Heifers (7-14 months) Saudi style barns	100
Heifers (4-6 months) Saudi style barns	700
Calves (under 3 months) individual hutches	1,000
Bulls	10
<b>Total dairy herd size</b>	<b>13,510</b>

**Conclusion:** The proposed addition of the 13,510 dairy cow herd at the expanded dairy facility site will generate new PM<sub>10</sub> emissions. However, with implementation of the required mitigation measures the impact will be less than significant.

#### **Mitigation Measure #2.6.3.2-2 PM<sub>10</sub> Control Measures – Expanded Dairy Facility:**

1. Milk cows housed in freestalls shall not be allowed in exercise pens. Exercise pens shall be permanently blocked off and made inaccessible.
2. Shade structures shall be provided for the following cows: 950 heifers (15-24 months) and 950 heifers (7-14 months). Saudi-style barns shall be provided for the following: 200 milk cows, 1,000 dry cows, 300 heifers (15-24 months), 100 heifers (7-14 months) and 700 heifers (4-6 months). Calves shall be housed in individual above-ground calf hutches.
3. Sufficient sprinkling shall be undertaken in heifer corrals (heifers 7-14 months) to match daily evaporation.
4. At least one of the daily feedings of the heifers shall be near (within one hour of) dusk.
5. Weekly scraping of corrals using pull-type scraper in the morning hours except when prevented by wet conditions (this also applies to the existing dairy).
6. Dry manure (both facilities) shall not be applied to fields when wind speeds exceed 10 miles per hour.
7. Field perimeter roads and onsite facility roads shall be stabilized such that no visible dust clouds beyond the site boundary from manure spreading or agricultural service vehicles using these roads. All onsite dairy facility roads shall be surfaced with gravel, sand, or decomposed granite.

8. Mud or dirt on project-adjacent public roads which originates from project operations shall be removed within 24 hours of deposition.
9. Begin establishing windbreak(s) around the dairy in accordance with National Resource Conservation Practice Standard Code 380-Windbreak/Shelterbelt establishment or other District-approved guidelines for downwind windbreaks for all cows and upwind windbreaks for all cows except milk and dry cows.

**Effectiveness of Measure:** Implementation of the described control measures will reduce the project-related PM<sub>10</sub> emissions from the expansion to 11.924 tons per year which is below the District's PM<sub>10</sub> emission threshold of 15 tons per year.

**Mitigation Measure #2.6.3.2-3 PM<sub>10</sub> Control Measures – Existing Dairy Facility:** In addition to the control measures directed to the expanded milk cow herd, the owner/operator has agreed to implement the following measures at the existing permitted dairy facility site:

1. The cow herd at the existing dairy to be reduced from 6,204 to 5,610 cows; the herd composition to be:

Type	Number
Milking cows	2,600
Dry cows	500
Heifers (15-24 months)	1,000
Heifers (7-14 months)	800
Calves (4-6 months)	400
Calves (under 3 months)	300
Bulls	10
<b>Total</b>	<b>5,610</b>

2. At least one of the daily feedings of the heifers shall be near (within one hour of ) dusk.
3. Weekly scraping of corrals using pull-type scraper in the morning hours except when prevented by wet conditions.
4. In accordance with National Resource Conservation Service (NRCS) Conservation Practice Standard Code 380-Windbreak/Shelterbelt shall install upwind shelterbelts for heifers (7-14 months of age).
5. Sufficient sprinkling in heifer corrals (heifers ages between 7-24 months) to match daily evaporation.

**Effectiveness of Measure:** These measures will reduce the PM<sub>10</sub> emissions at the existing dairy facility by 6.776 tons, from 18.803 to 12.027 tons per year. The overall increase in PM<sub>10</sub> emissions from this project will be 5.148 tons per year (11.924 tons increase from expansion – 6.776 tons decrease from existing operation = 5.148).

### **Mitigation Measure #2.6.3.2-4 PM<sub>10</sub> Offset Purchase:**

1. The owner/applicant has purchased 3.47 tons of PM<sub>10</sub> (at the appropriate Distance Offset ratio).

**Effectiveness of Measure:** Purchase of the remaining 3.47 tons of PM<sub>10</sub> will eliminate all project-related PM<sub>10</sub> emissions.

**Implementation/Monitoring:** The implementation by the owner/applicant of the PM<sub>10</sub> mitigation measures is required as a condition of the Permit to Operate by the SJVAPCD. Monitoring shall be by the SJVAPCD.

### **Impact #2.6.3.3 Operational Emission of Criteria Pollutant, Volatile Organic Compounds (VOC)**

**[Evaluation Criteria (a), (b), (c), (d)]**

The proposed addition of a 13,510 dairy cow herd will generate new VOC emissions. Mobile source emissions will increase by 0.33 tons/year.

**Conclusion:** With implementation of the required mitigation measures this air quality impact will be less than significant.

### **Mitigation Measure #2.6.3.3-1 VOC Control Measure – Expanded Dairy Facility:**

1. Flush/Spray down milking parlor(s) immediately prior to, immediately after, or during the milking of each group of cows.
2. Concrete feed lanes and walkways.
3. All but 200 milk cows housed in freestall barns with water drainage to separator facilities.
4. Feed lanes and walkways for all milk and dry cows flushed at least four times per day.
5. All corrals adequately sloped to promote and achieve full drainage.
6. Corrals shall be managed to ensure drainage and prevent water from standing more than forty-eight (48) hours after a storm.
7. Leachate from the silage piles shall be collected and sent to a waste treatment system such as a lagoon in a timely manner (minimum of once every twenty-four (24) hours).
8. All animals fed in accordance with National Research Council (NRC) or other District approved guidelines utilizing routine nutritional analysis for rations.
9. Silage shall be fully enclosed or covered with tarps, except for the area where feed is being removed from the pile.

10. Silage Face Management (only disturb the required area of face – leave remaining area undisturbed).
11. Refused feed shall be pushed up to be re-fed or removed from feed lanes on a daily basis to prevent decomposition.
12. Solid manure shall be harrowed in thin layers in corrals and drying areas to facilitate aerobic drying. This requirement shall not apply when wet weather conditions make this practice infeasible.
13. Installation of a two-stage anaerobic treatment lagoon designed according to NRCS Guidelines.
14. Solid manure shall be incorporated into fields immediately (within two hours) after application.

**Effectiveness of Measure:** Implementation of the described control measures will reduce the project-related VOC emissions from the expansion to 37.2 tons.

**Mitigation Measure #2.6.3.3-2 VOC Control Measures – Existing Dairy Facility:** Control measures shall also be required for operation of the existing dairy.

1. Flush/Spray down milking parlor(s) immediately prior to, immediately after, or during the milking of each group of cows.
2. Feed lanes and walkways for all milk and dry cows flushed at least four times per day.
3. At least one of the daily feedings of the heifers shall be near (within one hour of) dusk.
4. All animals fed in accordance with National Research Council (NRC) or other District-approved guidelines utilizing routine nutritional analysis for rations.
5. Weekly scraping of corrals using pull-type scraper in the morning hours except when prevented by wet conditions.
6. Irrigation of crops using liquid and slurry manure from a holding/storage ponds.
7. Utilization of manure water and manure will be in thin layers, blending such manure water with irrigation water in compliance with the nutrient management plan.

**Effectiveness of Measure:** Implementation of the described control measures, including the reduction in herd size, will reduce the existing dairy facility VOC emissions by 8.5 tons, from 40.8 tons to 32.3 tons per year. The combined operational emissions for the existing and

expanded dairy facility are 69.5 tons of VOC per year (37.2 tons from expansion<sup>2</sup> + 32.3 tons from existing).

The total increase in emissions after the mitigation measures from the existing and expansion is 28.68 tons (37.2 tons increase from expansion – 8.5 decrease from existing = 28.7 tons).

**Mitigation Measure #2.6.3.3-3 Reduction in Milking Cows:** In addition to the above VOC control measures the owner applicant has agreed to reduce the number of milking cows in Fresno County.

1. The owner/applicant shall purchase and permanently close two dairies in the District. The 1,174 milking cows thereon shall be transferred to the Bar 20 Dairy. (The two dairies are the JMC Dairy located on 13<sup>th</sup> Street approximately ½ mile north of Grangeville Boulevard in Kings County, 504 milking cows, and the Joe Machado Dairy located on Henry Street approximately 1-1/2 miles west of State Route 99 in Merced County, 670 milking cows.)
2. From a third dairy site in Fresno County, located at Madison Avenue and Brawley Avenue 17 miles east of the project site, the owner/applicant shall transfer 433 milking cows, 53 dry cows, and 11 heifers to this project, and shall then convert the dairy into a heifer ranch. The heifer ranch shall be limited to 400 heifers (200 age 15-24 months and 200 under 15 months).

**Effectiveness of Measure:** This measure will reduce VOC emissions by 14.2 tons per year. These measures, together with the implementation of Mitigation Measures #2.6.3.2-1, 2 and 3, will further reduce the VOC emissions to 14.59 tons per year (28.7 – 14.2 tons = 14.5 tons/yr.).

**Mitigation Measure #2.6.3.3-4 Purchase of Emission Reduction Credits:**

1. The owner/applicant has purchased 4.9 tons of VOC at the appropriate Distance Offset Ratio.

**Effectiveness of Measure:** This will reduce the overall project emissions to 9.9 tons of VOC per year, which is less than the District's significance threshold of 10 tons/year.

**Implementation/Monitoring:** The implementation by the owner/applicant of the VOC mitigation measures is required as a condition of the Permit to Operate by the SJVAPCD. Monitoring shall be by the SJVAPCD.

**Impact #2.6.3.3-5 Operational Emission of Criteria Pollutants, Nitrogen Oxide (NOx):**  
[Evaluation Criteria (a), (b), (c), (d)]

The Bar 20 Dairy expansion project will increase nitrogen oxide (NOx) emissions resulting from additional on-road vehicle and truck traffic and mobile dairy equipment.

**Conclusion:** On-road vehicle trips include feed trucks, milk trucks and employee vehicles. Mobile dairy equipment would include a diesel tractor used for manure scraping. The combined

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<sup>2</sup> This includes the liquid handling from the expansion since this system is associated with the expansion and controls were proposed to the post-project.

NOx emissions from these sources is 2.3 tons per year (see Appendix A for calculations). As the NOx emissions for the project are less than the SJVAPCD significance threshold level of 10 tons per year the impact is less than significant.

**Mitigation Measure #2.6.3.3-5:** Although project impacts are less than significant the following mitigation measure is recommended to further reduce NOx emissions.

1. Employees will be encouraged to carpool travel to and from the project site.
2. Idling time of on-site project farming and dairy operations equipment shall be minimized.
3. All on-site equipment shall be properly tuned and maintained in accord with manufacturer's specifications.
4. Whenever feasible, alternative fueled or electrical on-site equipment shall be utilized.
5. Minimum practicable on-site engine sizes shall be used.
6. On-site gasoline powered equipment shall be equipped with catalytic converters.
7. Employees will be encouraged to carpool to and from the project site.

**Effectiveness of Measures:** The implementation of these measures will further reduce NOx emissions.

**Implementation/Monitoring:** The listed implementation measures will be a condition of the Permit to Operate for the project. The owner/operator of the project will be responsible for implementation. Monitoring thereof will be the continuing responsibility of the SJVAPCD.

**Impact #2.6.3.3-6 Health Risks**  
**[Evaluation Criteria (d)]**

The SJVAPCD staff has modeled the proposed project to determine if there is a health risk from project-derived pollutants (see Appendix B) and has determined that in accord with the criteria incorporated in the District's "Guide for Assessing and Mitigating Air Quality Impacts" (GAMAQI) no such risk exist for any offsite sensitive receptor.

**Conclusion:** The project does not expose sensitive receptors to substantial pollutant concentrations; there is no significant health risk impact.

**Mitigation Measure:** None required.

**Impact #2.6.3.3-7 Odor Emissions:**  
**[Evaluation Criteria (e)]**

Although odors from raising livestock are exempt from direct regulation by the local air quality jurisdiction under California state law [California Health and Safety Code, Section 41705 (a)], odor can still be considered a perceived nuisance and an environmental impact.

Odor formation and transport from dairy operations – corrals, lagoons, freestalls – is a complex process. Odor formation is most rapid during hot weather when anaerobic conditions set in the fastest. Conversely, atmospheric dispersion is best when heated surfaces induce gusty winds and convective turbulence. There is therefore no time of day when odor potential is minimized. Odors “generate” faster in the day, but disperse faster. Slower nocturnal chemistry is offset by more stagnant meteorology.

The prevailing wind direction in Fresno County is toward the southeast based upon Fresno-Yosemite Airport wind rose records.

Factors which impact the analysis of the significance of odor impacts include the influence of the proposed dairy’s modern design incorporating concrete-base, flushed, freestalls and walk lanes and water drainage to separator facilities, together with SJVAPCD–required operational mitigation measures for other impacts resulting in odor reduction as a supplemental benefit.

The nearest off-site residential dwelling is approximately 500 feet west of from the expanded dairy facilities site. There are 9 offsite residential units within 1 mile of the dairy facility site (see Figure 2-4 on page 2-6).

The procedure outlined for odor analysis in the SJVAPCD’s “Guide for Assessing and Mitigating Air Quality Impacts” (GAMAQI) includes the following:

- *Identify the location of sensitive receptors (including residences).*
- *Compare the distance to the nearest sensitive receptor to the distances in Table 4-2 of the GAMAQI. If the sensitive receptors are further away than the distances given in Table 4-2, no further analysis is required. The results should be documented in the EIR.*
- *Obtain any odor complaints against the facility or similar facilities from the local District office and the County’s environmental health department.*
- *Review the complaints to determine the location of complainants relative to the facility.*
- *Identify any sensitive receptors at similar distances.*
- *Determine if emissions of odiferous compounds will increase or decrease with implementation of the project.*
- *Draw any reasonable conclusions as to the probability that the project will generate odor complaints based on this analysis of complaint history.*

In reiteration of the standard analysis contained in the preceding discussion, and in compliance with the GAMAQI process:

- *Identify the location of sensitive receptors (including residences).*

See Figure 2-4 on page 2-6.

- *Compare the distance to the nearest sensitive receptor to the distances in Table 4.2 of the GAMAQI. If the sensitive receptors are further away than the distances given in Table 4-2, no further analysis is required. The results should be documented in the EIR.*

GAMAQI Table 4-2 and its pertinent accompanying text are:

**Table 4-2 (GAMAQI)  
Project Screening Trigger Levels  
For Potential Odor Sources**

<b>Type of Facility</b>	<b>Distance</b>
<i>Wastewater Treatment Facilities</i>	<i>2 miles</i>
<i>Sanitary Landfill</i>	<i>1 mile</i>
<i>Transfer Station</i>	<i>1 mile</i>
<i>Composting Facility</i>	<i>1 mile</i>
<i>Petroleum Refinery</i>	<i>2 miles</i>
<i>Asphalt Batch Plant</i>	<i>1 mile</i>
<i>Chemical Manufacturing</i>	<i>1 mile</i>
<i>Fiberglass Manufacturing</i>	<i>1 mile</i>
<i>Painting/Coating Operations (e.g. auto body shops)</i>	<i>1 mile</i>
<i>Food Processing Facility</i>	<i>1 mile</i>
<i>Feed Lot/Dairy</i>	<i>1 mile</i>
<i>Rendering Plant</i>	<i>1 mile</i>

*Because offensive odors rarely cause any physical harm and no requirements for their control are included in state or federal air quality regulations, the SJVAPCD has no rules or standards related to odor emissions, other than its nuisance rule<sup>35</sup>. Any actions related to odors are based on citizen complaints to local governments and the SJVAPCD. Lead Agencies can make a determination of significance based on a review of District complaint records as described in Section 5. For a project locating near an existing source of odors, the impact is potentially significant when the project site is at least as close as any other site that has already experienced significant odor problems related to the odor source. Significant odor problems are defined as:*

- *More than one confirmed complaint per year averaged over a three year period, or*
- *Three unconfirmed complaints per year averaged over a three-year period.*

*For projects locating near a source of odors where there is currently no nearby development and for odor sources locating near existing receptors, the determination of significance should be based on the distance and frequency at which odor complaints from the public have occurred in the vicinity of a similar facility.*

There are 9 offsite dwelling units within one mile of the existing dairy facilities site.

- *Obtain any odor complaints against the facility or similar facilities from the local District office and the county’s environmental health department.*

No such odor complaints have been filed with the Fresno County Environmental Health Department, or the SJVAPCD.

- *Review the complaints to determine the location of complainants relative to the facility.*

Not applicable.

- *Identify any sensitive receptors at similar distances.*

Not applicable.

- *Determine if emissions of odiferous compounds will increase or decrease with implementation of the project.*

There will be an animal unit-proportional potential for emissions of odiferous compounds.

- *Draw any reasonable conclusions as to the probability that the project will generate odor complaints based on this analysis of complaint history.*

There are 9 dwelling units within 1 mile of the proposed dairy. The operation of the dairy facility is not expected to generate odor complaints.

**Conclusion:** It is concluded, based upon the above data and analysis that the project will not create objectionable odors affecting a substantial number of people, and that the impact of project-generated odors is therefore less than significant.

**Mitigation Measures:** None are required.

**Impact #2.6.3.3.8 Local Carbon Monoxide (CO) Concentrations:  
[Evaluation Criteria (b)]**

Concentrations of this pollutant are related to the levels of traffic and congestion along streets and at intersections.

The SJVAPCD'S *Guide for Assessing and Mitigation Air Quality Impacts* provides screening criteria to identify situations where modeling is warranted. If neither of the following criteria is met at intersections affected by the project, the project is concluded to have no potential to create a violation of the carbon monoxide standards:

- The Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F.
- The project will substantially worsen an already existing LOS F on one or more streets or at one or more intersections in the project vicinity.

Although not stated expressly, the above criteria are to be applied to signal controlled intersections rather than stop sign controlled intersections. The project is served by rural streets and highways with stop sign controlled intersections with good levels of service, indicating little potential for exceedance of the carbon monoxide standards.

**Conclusion:** Based on the SJVAPCD criteria and the limited amount of project-related traffic on Whites Bridge Road, the project would have no potential to create a violation of the carbon monoxide standards. Any carbon monoxide concentration increases resulting from the proposed project would be less than significant.

**Mitigation Measures:** None required.

Table #2.6.3.4 summarizes the mitigated project emissions.

The mitigated impacts have been evaluated by the District and it has determined that none of such impacts are sufficient to warrant a conclusion that they are cumulatively significant. This analysis includes any impacts on global warming which will be effected by project-related emissions of methane, carbon dioxide, or NOx compounds. Such analysis is not predicated on a 'ratio' comparison of project impacts to total worldwide emissions but upon rational consideration of the de minimus project effects with relationship to the magnitude of the global warming phenomena and its apparent causes and of the economic infeasibility of any further mitigation measures.

**Table 2.6.3.4  
Operational Emissions of Pollutants (tons/year) from Proposed Dairy Expansion**

Source	VOC	NOx	PM10	PM2.5	NH3	CH4
Truck Trips (On Road Delivery Vehicles)	0.1	1.7	0.2	0.1	--	--
Employee and Visitor Travel	0.2	0.2	0.2	0.1	--	--
Mobile Dairy Equipment	0.03	0.4	0.02	0.02	--	0.003
Dairy Operational Emissions including Cattle in Corrals <sup>a</sup>	37.2	0.0	11.92	1.4	145.9	1,332.7
<b>Less Existing Dairy Mitigation Including Herd Reduction (Dairy Operational Emissions including Cattle in Corrals)<sup>b</sup></b>	-8.5	0.0	-6.8	-0.8	-11.7	-68.0
<b>Less Closed or Converted Dairies (Dairy Operational Emissions including Cattle in Corrals)<sup>c</sup></b>						
JMC Dairy	-4.9	--	-1.4	-0.2	-18.6	-205.3
Joe Machado Dairy	-6.5	--	-1.8	-0.2	-24.8	-272.9
Heifer Ranch Conversion	-2.9	--	0.7	0.1	-11.5	-154.6
<b>Less Emission Offsets<sup>d</sup></b>	-4.9	--	-3.5	--	--	--
Total Project Emissions	9.9	2.3	-0.4	0.4	79.3	631.9
SJVUAPCD Threshold	10	10	15	--	--	--

See Appendix A for calculation

<sup>a</sup>This is the emissions increase at the expanded dairy. The following mitigation measures are included in the Expanded Dairy emissions: Mitigation Measures 2.6.3.1-1 (PM10 Control Measures - Expanded Dairy Facility) and 2.6.3.2-1 (VOC Control Measure - Expanded Dairy Facility).

<sup>b</sup>This is the emissions decrease at the existing dairy. Emission reductions are per Mitigation Measures 2.6.3.1-2 (PM10 Control Measures - Existing Dairy Facility) and 2.6.3.2-2 (VOC Control Measures - Existing Dairy Facility).

<sup>c</sup>Emission reductions are per Mitigation Measure 2.6.3.2-3 (Reduction in Milking Cows). Emissions include cattle housing, manure handling, and enteric emissions. Although not calculated, additional emission reductions would occur from the elimination of mobile dairy equipment and truck, employee, and visitor trips.

<sup>d</sup>Emission offsets are per Mitigation Measures 2.6.3.1-3 (PM10 Offset Purchase) and 2.6.3.2-4 (Purchase of Emission Reduction Credits).

Note: The proposed dairy expansion would not change the support crop acreage or crop types; therefore, the emissions change associated with agricultural activities would be zero.

**Issues:**

**2.6.4 BIOLOGICAL RESOURCES – Would the project:**

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Substantial Adverse Effect on Candidate, Special-Status or Sensitive Species [Evaluation Criteria (a)]**

The burrowing owl and tricolor blackbird are the only special-status animal species that may potentially breed in the existing 3,420 acres of irrigated cropland. San Joaquin kit fox may occasionally forage or pass through. Swainson’s hawk may seasonally forage on the site.

**Conclusion:** The project is increasing the dairy herd within the existing dairy facilities sites. As there will be no alterations of the existing land uses, there will be no adverse impacts on candidate, special-status or sensitive species.

**Mitigation Measures:** None required.

**Substantial Adverse Effect on Riparian Habitat**  
**[Evaluation Criteria (b)]**

Projects that result in removal of or disturbance to riparian habitat can have substantial impact on flora and fauna.

**Conclusion:** The project site includes the dairy facilities sites and 3,420 acres of intensively developed agricultural use. As no riparian habitat exists, no adverse impacts will occur.

**Mitigation Measures:** None required.

**Substantial Adverse Effect on Federally Protected Wetlands**  
**[Evaluation Criteria (c)]**

Vernal pools and other wetlands are becoming increasingly rare in California. Projects that go forward on sites where wetlands occur must have appropriate authorization from the U.S. Army Corps of Engineers.

**Conclusion:** There are no vernal pools wetlands on the existing project site. There is no adverse impact.

**Mitigation Measures:** None required.

**Interference with Movement of Native Wildlife**  
**[Evaluation Criteria (d)]**

The proposed increase in dairy herd size will be confined to the existing dairy facilities sites.

**Conclusion:** The proposed project will have no effect on the regional movements of terrestrial wildlife.

**Mitigation Measures:** None required.

**Local Policy/Ordinances Conflict**  
**[Evaluation Criteria (e)]**

There are no applicable or pertinent tree preservation policies or ordinances affecting the project area.

**Conclusion:** There is no impact.

**Mitigation Measures:** None required.

**Habitat Conservation Plan or Other Plan Conflict**  
**[Evaluation Criteria (f)]**

There are no applicable or pertinent habitat conservation plans or natural community preservation plans affecting the project area.

**Conclusion:** There is no impact.

**Mitigation Measures:** None required.

Issues:

**2.6.5 CULTURAL RESOURCES -- Would the project:**

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Response:**

**Cultural Resources**

**[Evaluation Criteria (a), (b), (c), (d)]**

There are no historic buildings or other potential historic resources on the project site. The project site has been farmed for many years, and the dairy facilities have been constructed without evidence of archaeological, paleontological, or human remains.

**Conclusion:** The project, an increase in dairy herd size, will have no environmental impact.

**Mitigation Measures:** None required.

**Issues:**

Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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**2.6.6 GEOLOGY/SOILS -- Would the project:**

- |                                                                                                                                                                                                                                                                                        |                          |                          |                          |                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving?                                                                                                                                                       |                          |                          |                          |                                     |
| i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| ii) Strong seismic ground shaking?                                                                                                                                                                                                                                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| iii) Seismic-related ground failure, including liquefaction.                                                                                                                                                                                                                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| iv) Landslides                                                                                                                                                                                                                                                                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Result in substantial soil erosion or the loss of topsoil?                                                                                                                                                                                                                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction of collapse?                                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building code (1994), creating substantial risks to life or property?                                                                                                                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

***Response:***

**Seismic Effects**

**[Evaluation Criteria (a) i, ii, iii]**

There are no known earthquake faults, active or inactive, at or near the project site, although several faults are within a 60 to 70-mile radius of the project site.

The Five-County Seismic Safety Element places the project site in an area of minimal ground shaking, with no likelihood of ground failure or liquefaction. Project structures have been required by Fresno County to comply with building code requirements.

**Conclusion:** There are no significant seismic-related project impacts.

**Mitigation Measures:** None required.

### **Landslides**

#### **[Evaluation Criteria (a) iv]**

Site topography is essentially level, less than one percent slope prior to land leveling for agricultural production.

**Conclusion:** There is no potential landslide impact.

**Mitigation Measures:** None required.

### **Soil Erosion, Topsoil Loss**

#### **[Evaluation Criteria (b)]**

Dairy facility site slopes are minimal (0.33% to 4%); and the balance of the project site, with slopes generally not exceeding two percent, will be double-cropped or maintained in alfalfa.

**Conclusion:** The dairy operation will not create soil erosion or occasion loss of topsoil; there will not be an impact.

**Mitigation Measures:** None required.

### **Soil Instability**

#### **[Evaluation Criteria (c)]**

Landslide potential and liquefaction potential have been discussed, and found to be less than significant. There is no evidence in the geologic record that "Old Alluvium" or its derivative soils are subject to lateral spreading. Subsidence is due to non-compacted, wind-deposited, soils consolidation under load, or to severe ground water overdraft; no such soils or severe overdraft exists at the project site.

**Conclusion:** There will be no soil instability impact.

**Mitigation Measures:** None required.

**Expansive Soils Hazards**  
**[Evaluation Criteria (d)]**

The existing dairy facility sites have been constructed on Chino series Traver soils which are classified as medium or high with respect to expansion attributes, as defined in Table 18-1-B of the 1994 Uniform Building Code. No multi-story or pile-supported structures have been constructed as a part of the project. Design modification of footings or slabs were therefore not required, but only normal compliance with Uniform Building Code requirements.

**Conclusion:** There are no expansive soil hazard-related significant impacts.

**Mitigation Measures:** None required.

Issues:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>2.6.7 HAZARDS/HAZARDOUS MATERIALS – Would the project:</b>				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Response:**

**Operational Hazards**

**[Evaluation Criteria (a), (b), (c)]**

Hazardous materials are used for the operation of the dairies and continued agricultural production at the project site, but are applied by contract and not stored on the project site. Fuel stored in aboveground tanks, lubricants, and cleaning solutions are required for the operation and maintenance of equipment during and after construction. Pesticides (for control of vectors) and medicines for dairy cattle are used at the dairies. Agricultural chemicals, including insecticides, herbicides, and fertilizer, are used for continued farming at the site.

The RWQCB requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for the dairy in compliance with the provisions of the General Waste Discharge Requirements for Milk Cow Dairies. The SWPPP is required to include provisions for the safe storage, use, and disposal of hazardous materials. In addition, all use of restricted agricultural chemicals is controlled by Federal and State laws and regulations enforced by the California Department of Pesticide Regulation (DPR).

**Conclusion:** Due to the hazardous nature of some materials that are utilized by the dairy, operational hazards are potentially significant.

**Mitigation Measure #2.6.7.1:** The owner/operator shall submit documentation to the SJVAPCD that appropriate permits and notifications regarding the storage, transport, use and disposal of hazardous materials have been completed and acquired. The documentation shall include, at minimum, evidence of compliance with:

1. An employee safety program in accord with California Labor Code Section 6401.7.
2. The RWQCB requirements, including a Storm Water Pollution Prevention Plan incorporating provisions for the safe storage, use, and disposal of hazardous wastes.
3. The permitting requirements of the California Department of Pesticide Regulation.

**Effectiveness of Measure:** Compliance with the measure will reduce the potential impact to less than significant.

**Implementation/Monitoring:** This requirement shall be a condition of the SJVAPCD's Authority to Construct (ATC) and Permit to Operate (PTO) approvals; monitoring thereof shall be the responsibility of the SJVAPCD, and the Regional Water Quality Control Board.

**Site Hazards**

**[Evaluation Criteria (d)]**

The site is not on or near a hazardous waste site, as verified by review of the State of California Hazardous Waste and Substances Sites List (1998).

**Conclusion:** No evidence exists that the site is a designated hazardous waste site; there is no impact.

**Mitigation Measures:** None required.

### **Airport Hazards**

**[Evaluation Criteria (e), (f)]**

The dairy facilities are located outside of any airport restricted zones established in the Fresno County Health and Safety Element.

**Conclusion:** The impact is less than significant.

**Mitigation Measures:** None required.

### **Emergency Evacuation and Wildland Fires**

**[Evaluation Criteria (g), (h)]**

The dairy has been developed on private farmland and does not interfere with the County's public emergency evacuation plan. Surrounded by irrigated farmland, the project site is not within a recognized wildland fire hazard area.

**Conclusion:** No environmental impacts will occur.

**Mitigation Measures:** None required.

Issues:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>2.6.8 HYDROLOGY/WATER QUALITY – Would the project:</b>				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Response:**

**Violation of Water Quality Standards or Waste Discharge Requirements  
[Evaluation Criteria (a)(f)]**

The Basin Plan establishes Water Quality Objectives for Ground Waters (Pages III-7 and III-8). These objectives are further defined in and supplemented by State Water Board water quality control policies and State Water Quality Control Board water quality control plans, as applicable to the Tulare Lake Basin and outlined in Section V of the Basin Plan. It is against this background that possible violation of water quality standards is evaluated. The Regional Water Quality Control Board conducts further evaluation, and establishes project-specific requirements in permitting dairy operation.

The project applicant has submitted a Report of Waste Discharge (see Appendix C) which demonstrates that the expanded dairy facility site located south of Whites Bridge Road will, after offsite disposal of the corral-scraped and separator basin-settled solid wastes, comply with the nitrogen loading and salt loading groundwater protection requirements of the Regional Water Quality Control Board.

The Regional Water Quality Control Board, in its comments on a recent, EIR in Tulare County has commented as follows: *...Water supply wells in proximity to sources of pollution have the potential to act as conduits for the migration of pollutants to groundwater. California Well Standards (Department of Water Resources Bulletin 74-90) state: "When, at the approval of the enforcing agency, a water well is located closer to a source of pollution or contamination than allowed by Section 8, page 12, above (less than 100 feet from an animal enclosure, etc), the annular space shall be sealed from ground surface to the first impervious stratum if possible. The annular seal for all such wells shall extend to a minimum depth of 50 feet." It should be demonstrated that existing or planned water supply wells located within 100 feet of corrals, wastewater retention components, and/or cropland where dairy wastewater will be applied have been constructed to the standard specified in the California Well Standards.*

The dairy facilities site north of Whitesbridge Road has been previously permitted by the Regional Water Quality Control Board. The dairy facilities site south of Whitesbridge Road is the subject of a Report of Waste Discharge (February, 2004) a copy of which is appended to this document.

The project applicant has, or will, in accordance with the RWQCB's direction, and as a condition of obtaining Report of Waste Discharge acceptance or project approval under Order No. 96-270, undertaken the following steps:

1. Obtained available subsurface geologic and well construction data for all wells "within 100-feet of proposed wastewater retention ponds, corrals or cropland where wastewater will be applied" to determine whether casing seals or other construction details will prevent vertical migration of dairy wastewater.

2. When such positive determination cannot be made from well records, the applicant will:
  - a. Periodically, upon a schedule and with procedures approved by the RWQCB, test wells to assure that vertical migration of dairy wastewater is not taking place, and, when indicated by test results,
  - b. Construct casing seals, as approved by the RWQCB to prevent migration.

Since the wells are not associated with an identified or identifiable environmental impact, these procedures are not specified as mitigation measures. However, the applicant has agreed to take these voluntary steps as part of compliance with the RWQCB's requirements.

**Conclusion:** The dairy operation is not in violation of water quality standards or waste discharge requirements as impoundments have been designed to preclude significant leakage to groundwater. Dairy lagoons and separator ponds have been lined to minimize leakage to groundwater.

**Mitigation Measures:** None required.

#### **Depletion of Groundwater Supplies [Evaluation Criteria (b)]**

Water for continued farming and dairy operations on the project site is provided by onsite wells.

The groundwater in the project area (see Appendix C) is of adequate quality for irrigation and, dependent upon regional rainfall/drought cycles, generally ranges in depth below ground surface from 40 to 74 feet.

The project is to increase the number of milk cows from 2,904 to 9,400. The increase in water usage will be from 260 acre-feet per year to 842 acre-feet per year. Current and projected water usage is based on the dairy operational design of 80 gallons of water per day per milk cow. The 482 acres currently occupied by the dairy facilities sites was previously farmed and using an estimated 1,446 acre-feet of irrigation water per year. This estimated water usage is based on an annual field crop utilization rate of 3 acre-feet per acre.

**Conclusion:** The project will result in no significant depletion of groundwater supplies.

**Mitigation Measures:** None required.

#### **Drainage Pattern Alteration [Evaluation Criteria (c), (d)]**

The increased number of milk cows and support stock will be housed within the existing dairy facility sites.

**Conclusion:** The project will result in no runoff which would exceed onsite storage capacity or provide a source of polluted runoff, nor would it result in siltation or erosion.

**Mitigation Measures:** None required.

**Surface Runoff and Flood Hazard**  
**[Evaluation Criteria (d), (e), (g), (h)]**

The project lagoons have been constructed to retain all storm runoff on-site during a 25-year storm, plus the runoff from 120 days of December through March average rainfall plus all dairy wastewater, discharging such runoff to the wastewater lagoon.

**Conclusion:** To the extent that runoff could occur from project fields fertilized with manure, such runoff is, and will be, contained on site with irrigation return systems and bermed fields which are currently appropriately designed to prevent offsite discharge of irrigation or rainfall runoff. Although small portions of the project site are within a mapped 100-year flood plane (see Figure 2-5), the dairy facilities expansion has been constructed in compliance with the Basin Plan, and is not expected to result in any significant impact to surface water. Project operation will result in no runoff which would exceed onsite storage capacity or provide a source of polluted runoff. The likelihood of offsite pollution from irrigation usage of lagoon liquid is thus less than significant.

**Mitigation Measures:** None required.

**Dam Failure**  
**[Evaluation Criteria (i)]**

The project site is located within the plotted dam failure inundation zone of Little Panoche Dam.

**Conclusion:** The low probability of the occurrence of dam failure, the large volume of flood water available for dilution of pollutants, and the relatively long warning period to ready the site for flooding indicate that inundation related to dam failure is not a significant risk to the project. The potential impact is less than significant.

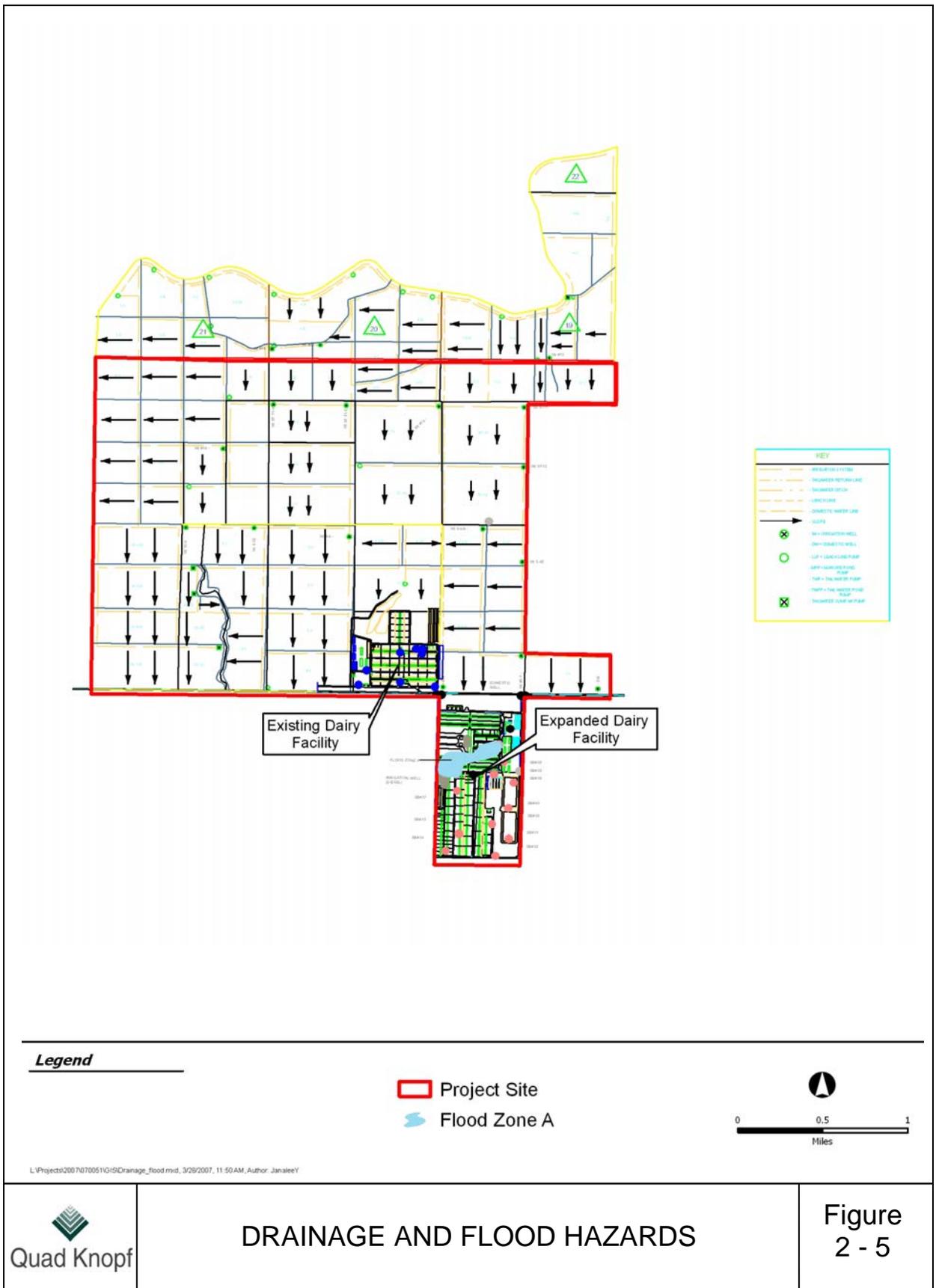
**Mitigation Measures:** None required.

**Seiche, Tsunami or Mudflow**  
**[Evaluation Criteria (j)]**

The project is not located near a body of water which could generate seiche or tsunami effects; site topography, as described in the setting portion of this topical analysis, does not support mudflow events.

**Conclusion:** There are no possible seiche, tsunami, or mudflow impacts.

**Mitigation Measures:** None required.



**Issues:**

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>2.6.9 LAND USE/PLANNING – Would the project:</b>				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

***Response:***

**Land Use/Planning  
[Evaluation Criteria (a), (b), (c)]**

The dairy is not near any established community and was constructed in compliance with applicable County of Fresno land use regulations.

**Conclusion:** There are no land use or planning impacts.

**Mitigation Measures:** None required.

ISSUES:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>2.6.10 MINERAL RESOURCES – Would the project:</b>				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

***Response:***

**Mineral Resources**

**[Evaluation Criteria (a), (b)]**

There are no known mineral resources located within the dairy project area.

**Conclusion:** The project will have no impact on mineral resources.

**Mitigation Measures:** None required.

**Issues:**

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>2.6.11 NOISE – Would the project result in:</b>				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

***Response:***

**Construction Noise**

**[Evaluation Criteria (a), (b), (d)]**

The dairy facilities have been constructed and will accommodate the proposed increase in milk cows and support stock. No construction noise will occur.

**Conclusion:** There will be no impact.

**Mitigation Measures:** None required.

**Traffic Noise**  
**[Evaluation Criteria (c)]**

The project will generate an increase of 130 trips per day of vehicular traffic.

**Conclusion:** With an annual average traffic volume of 4,900 vehicles per day on Whites Bridge Road (Caltrans 2005), the project's 130 trips represent a 3% increase in vehicular traffic along this route. This level of traffic will result in an increased noise level of less than 2 decibels along the roadway. This minimal increase in traffic noise levels is not generally detectable, and is therefore not a potentially significant impact.

**Mitigation Measures:** None required.

**Operational Noise**  
**[Evaluation Criteria (c)]**

Current operational activities include milking 2,904 cows and feeding a total herd size of 6,204 animals. The proposed increase in milk cows to 9,400, and a herd size of 19,120 will increase noise levels at the dairy facilities site.

**Conclusion:** The only noise receptor that may notice an increase in dairy activities is a residential unit located approximately 500 feet west of the expanded dairy facilities site. The increase in operational noise levels associated with the project will be less than significant.

**Mitigation Measures:** None required.

**Public and Private Airports**

The project site is not within an adopted airport land use plan or within 2 miles of a public airport or public use airport. There is, however, a small dirt airstrip located approximately 1,000 feet west of the expanded dairy facility site, south of Whites Bridge Road. Its usage is limited to crop-dusting, planting or agricultural support activities directly related to immediate area farming.

**Conclusion:** This small agricultural air strip will have no significant noise impacts on expanded dairy operations.

**Mitigation Measures:** None required.

Issues:

Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
--------------------------------	-----------------------------------------------------	------------------------------	-----------

**2.6.12 POPULATION AND HOUSING – Would the project:**

- |                                                                                                                                                                                                           |                          |                          |                          |                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?                                                                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?                                                                                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Response:**

**Population and Housing**  
[Evaluation Criteria (a), (b), (c)]

The increased number of milk cows and support stock will result in an additional 45 employees that will be recruited from the existing local workforce; thus there will be no direct population growth inducement.

The project will not displace any existing housing or persons.

**Conclusion:** The project will have no impact on population and housing.

**Mitigation Measures:** None required.

Issues:

Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
--------------------------------------	--------------------------------------------------------------	------------------------------------	--------------

**2.6.13 PUBLIC SERVICES – Would the project:**

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impact, in order to maintain acceptable service ratios for any of the public services:

Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Response:**

**Public Services  
[Evaluation Criteria (a)]**

The project, an increase in dairy herd size, will not have an impact on fire, police or other public facilities. Employment of additional personnel will be from the existing workforce and will, therefore, have no impact on schools, parks or other population-growth related public facilities and services.

**Conclusion:** The project will not have any impact on public services.

**Mitigation Measures:** None required.

ISSUES:

Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
--------------------------------	-----------------------------------------------------	------------------------------	-----------

**2.6.14 RECREATION – Would the project:**

- |                                                                                                                                                                                              |                          |                          |                          |                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Response:**

**Recreation**

**[Evaluation Criteria (a), (b)]**

The project workforce will be recruited from the existing local population; there will be no increased demand on parks or recreational facilities.

The project does not include recreational facilities and will not require expansion of existing recreational facilities.

**Conclusion:** No recreation-related impacts will occur.

**Mitigation Measures:** None required.

**Issues:**

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>2.6.15 TRANSPORTATION/TRAFFIC – Would the project:</b>				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections?)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Increased Traffic**

**[Evaluation Criteria (a)]**

The project’s increase in automobile/pickup traffic will be 90 trips per day, and the increase in truck traffic is 20 trips per day.

**Conclusion:** Traffic volumes on Whites Bridge Road in 2005 were 4,900 vehicles per day. The project-induced increase in traffic is not substantial with respect to increase in vehicle trips, volume-to-capacity ratio, or congestion at intersections, and thus is less than significant.

**Mitigation Measures:** None required.

**Level of Service**

**[Evaluation Criteria (b)]**

The County of Fresno has not established level of service (LOS) standards for rural roads.

**Conclusion:** The project will not have any adverse impacts.

**Mitigation Measures:** None required.

**Air Traffic Patterns**

**[Evaluation Criteria (a)]**

The project has no conceivable impact on air traffic patterns; it is not located near, or served by, a public airport.

**Conclusion:** There will be no air traffic impacts.

**Mitigation Measures:** None required.

**Traffic Hazards and Emergency Access**

**[Evaluation Criteria (d), (e)]**

The existing dairy facility sites are located on Whites Bridge Road.

**Conclusion:** Current access to Whites Bridge Road is 3 miles west of the nearest intersection, James Road. There are no sight distance impediments for traffic using the dairy access roadways to enter or leave the dairy facilities sites. The dairies require no “emergency access”. The location of these dairy facility sites do no affect any existing emergency access. The project will not alter the existing site access.

**Parking Conditions**

**[Evaluation Criteria (f)]**

The dairy facility sites contain adequate onsite parking for workers, salesmen, service vehicles and milk trucks.

**Conclusion:** There will be no adverse impacts.

**Mitigation Measures:** None required.

**Issues:**

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>2.6.16 UTILITIES/SERVICE SYSTEMS – Would the project:</b>				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

***Response:***

**Wastewater**

**[Evaluation Criteria (a), (b), (e)]**

The project facilities design complies with applicable water quality regulations enforced by the California Regional Water Quality Control Board, Central Valley Region.

The domestic water well is in compliance with Fresno County Environmental Health Department’s regulation as is the onsite septic tank and leach line system. The dairies do not use a wastewater treatment provider’s facilities.

**Conclusion:** There are no adverse environmental impacts.

**Mitigation Measures:** None required.

**Storm Water****[Evaluation Criteria (c)]**

All storm drainage runoff is contained onsite. The existing dairy facilities have been designed for such containment in accord with Regional Water Quality Control Board requirements.

**Conclusion:** The project will not have any adverse impacts.

**Mitigation Measures:** None required.

**Water Supply****[Evaluation Criteria (d)]**

Existing onsite water wells were developed to serve the proposed project.

**Conclusion:** No new water wells will be constructed.

**Mitigation Measures:** None required.

**Solid Waste****[Evaluation Criteria (f), (g)]**

The project will generate approximately 1 cubic yard per week of refuse that will be transported to the American Avenue Disposal Site which is expected to reach capacity in 2029.

Domestic refuse disposal from the project site complies with the County's landfill regulations.

**Conclusion:** The project will have a less than significant impact on solid waste disposal operations.

**Mitigation Measures:** None required.

**Issues:**

Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
--------------------------------------	--------------------------------------------------------------	------------------------------------	--------------

**2.6.17 MANDATORY FINDINGS OF SIGNIFICANCE**

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                          |                                     |                          |                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?                                                                                                           | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?                                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

***Response:***

(a), (c): Expansion of the dairy herd will have a potential adverse impact on air quality. However, the implementation of the mitigation measures outlined in Section 2.6.3 will reduce these impacts to a less than significant level.

(b): The SJVAPCD will require effective air quality mitigation measures for not only all new and/or expanding dairies, but also for existing dairies.

## 2.7 Environment Determination

This Initial Study has identified environmental factors that may be significant after mitigation. The various environmental issue areas are discussed in detail in the Checklist.

### **Determination**

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- The District finds that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, but because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

September 4, 2007

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ARNAUD MARJOLLET  
Permit Service Manager

## **APPENDICES**

**Appendix A**  
**Air Quality Calculations**

# Bar 20 Dairy Emission Calculations

## Emission Factors

### DAIRY PERMITS (C-5203-1, -2, -3, -4, -7, -8, -9, -10, -11, AND -12)

The emission factors for PM<sub>10</sub>, VOC, and NH<sub>3</sub> given in the following tables will be used to calculate the combined emissions from the dairy and the pre/post-project emissions from the following permit units: the milking parlor (permit C-5203-1 and C-52-03-7); the cow housing (permit C-5203-2 and C-5203-8); the liquid manure handling system (permit C-5203-3 and C-5203-9); the solid manure handling system (permit C-5203-4 and C-5203-10); and the Feed handling system (permit C-5203-4 and C-5203-10).

### PM<sub>10</sub> Emission Factors for the Dairy

The following tables list the PM<sub>10</sub> emission factors for the animals at the dairy. The control efficiencies for the different management practices proposed for this dairy will be applied to the uncontrolled emission factors to arrive at the controlled emission factors that will be used to calculate post-project PM<sub>10</sub> emissions from the dairy.

<b>Uncontrolled PM<sub>10</sub> Emission Factors for Animals at the Dairy</b>		
Type of Cow	Uncontrolled Emission Factor (lb-PM <sub>10</sub> /head-yr)	Source
Mature Cows (Milk and Dry Cows) in Freestalls	<b>1.37</b>	Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy
Mature Cows (Milk Cows, Dry Cows and Bulls) in Open Corrals	<b>5.46</b>	Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy
Heifers in Open Corrals	<b>10.55</b>	Based on a USDA/UC Davis report quantifying dairy and feedlot emissions in Tulare and Kern Counties (April 2001)
Calves	<b>1.37</b>	SJVAPCD

Pre-Project PM<sub>10</sub> Emission Factors

<b>PE<sub>1</sub> PM<sub>10</sub> Emission Factors (EF) for Animals at Dairy 1 (C-5203-2)</b>				
Type of Cow	Uncontrolled EF (lb-PM <sub>10</sub> /hd-yr)	Control(s)	Controlled EF Calculation	Controlled EF (lb-PM <sub>10</sub> /hd-yr)
Milk Cows in Corrals	5.46	Shade Structures (16.7%)	$5.46 \times (1-0.167) =$	<b>4.55</b>
Dry Cows in Open Corrals	5.46	-	-	<b>5.46</b>
Heifers & Bulls in Open Corrals	10.55	Shade Structures (8.3%)	$10.55 \times (1-0.083) =$	<b>9.67</b>
Calves	1.37	On-Ground Calf Hutches	$1.37 \times (1-0.75) =$	<b>0.34</b>

Post-Project PM<sub>10</sub> Emission Factors

<b>PE<sub>2</sub> PM<sub>10</sub> Emission Factors (EF) for Animals at Dairy 1 (C-5203-2-2)</b>				
Type of Cow	Uncontrolled EF (lb-PM <sub>10</sub> /hd-yr)	Control(s)	Controlled EF Calculation	Controlled EF (lb-PM <sub>10</sub> /hd-yr)
Milk Cows in Corrals	5.46	Weekly Scraping using Pull-Type Equipment in morning (15%) Shade Structures (16.7%)	$5.46 \times (1-0.15)(1-0.167) =$	<b>3.87</b>
Dry Cows in Open Corrals	5.46	Weekly Scraping using Pull-Type Equipment in morning (15%)	$5.46 \times (1-0.15) =$	<b>4.64</b>
Heifers in Open Corrals (15-24 months)	10.55	Shade Structures (8.3%) Weekly Scraping using Pull-Type Equipment in morning (15%) Feeding Heifers Near Dusk (10%) Sprinkling of Heifer Corrals (33%) <sup>1</sup>	$10.55 \times (1-0.083)(1-0.15)(1-0.10)(1-0.33) =$	<b>4.96</b>

<sup>1</sup> 66% coverage area x 50% control = 33% overall control

Heifers in Open Corrals (7-14 months)	10.55	Shade Structures (8.3%) Weekly Scraping using Pull-Type Equipment in morning (15%) Feeding Heifers Near Dusk (10%) Sprinkling of Heifer Corrals (33%) <sup>1</sup> Upwind Shelterbelt (10%)	$10.55 \times (1-0.083)(1-0.15)(1-0.10)(1-0.33)(1-0.10) =$	<b>4.46</b>
Heifers in Open Corrals (4-6 months)	10.55	Shade Structures (8.3%) Weekly Scraping using Pull-Type Equipment in morning (15%) Feeding Heifers Near Dusk (10%)	$10.55 \times (1-0.083)(1-0.15)(1-0.10) =$	<b>7.40</b>
Calves	1.37	On-Ground calf Hutches (75%)	$1.37 \times (1-0.75) =$	<b>0.34</b>
Bulls	10.55	Shades (8.3%) Weekly Scraping (15%)	$10.55 \times (1-0.083)(1-0.15) =$	<b>8.22</b>

<b>PE<sub>2</sub> PM<sub>10</sub> Emission Factors (EF) for Animals at Dairy 2 (C-5203-8-0)</b>				
Type of Cow	Uncontrolled EF (lb-PM <sub>10</sub> /hd-yr)	Control(s)	Controlled EF Calculation	Controlled EF (lb-PM <sub>10</sub> /hd-yr)
Milk Cows in Freestalls	1.37	Downwind Shelterbelts (12.5%) No exercise Pens (80%)	$1.37 \times (1-0.125)(1-0.80) =$	<b>0.24</b>
Milk and Dry Cows in Loafing Barns	5.46	Weekly Scraping using Pull-Type Equipment in morning (15%) Downwind Shelterbelts (12.5%) Saudi Style Barns (25%)	$5.46 \times (1-0.15)(1-0.125)(1-0.25) =$	<b>3.05</b>
Heifers in Open Corrals (7-24 months)	10.55	Shade Structures (8.3%) Feeding Heifers Near Dusk (10%) Weekly Scraping using Pull-Type Equipment in morning (15%) Upwind and downwind Windbreaks (22.5%) Sprinkling of Heifer Corrals (35.5%) <sup>2</sup>	$10.55 \times (1-0.083)(1-0.10)(1-0.15)(1-0.225)(1-0.355) =$	<b>3.70</b>

<sup>2</sup> 71% coverage area x 50% control = 35.5%

Heifers in loafing barns (4-24 months)	10.55	Feeding Heifers Near Dusk (10%) Weekly Scraping using Pull-Type Equipment in morning (15%) Upwind and downwind Windbreaks (22.5%) Saudi Style Barns (25%)	$10.55 \times (1-0.10)(1-0.15)(1-0.225)(1-0.25) =$	<b>4.69</b>
Calves	1.37	Upwind and Downwind Windbreaks (22.5%) Above-Ground Calf Hutches (95%)	$1.37 \times (1-0.225)(1-0.95) =$	<b>0.05</b>
Bulls	10.55	Shade Structures (8.3%) Upwind and Downwind Windbreaks (22.5%)	$10.55 \times (1-0.083)(1-0.225) =$	<b>7.50</b>

### VOC and NH<sub>3</sub> Emission Factors for the Dairy

The following tables list the VOC and NH<sub>3</sub> emission factors for the animals at the dairy. These emission factors and the control efficiencies given in the assumptions above will be used to calculate the pre-project and post-project VOC and NH<sub>3</sub> emissions from the dairy.

<b>Emission Factors for Dairy Cows<sup>3</sup></b>		
Type of Cow and Housing	(lb-VOC/cow-yr)	(lb-NH <sub>3</sub> /cow-yr)
Milk Cow (freestalls)	21.0	74.0
Milk Cow (corral or loafing barn)	19.3 <sup>4</sup>	74.0
Dry Cow (corral or loafing barn)	11.9	45.4
Heifer (15-24 mo) (corral or loafing barn)	8.3	31.8
Heifer (7-14 mo) (corral or loafing barn)	7.2	27.8
Heifer (4-6 mo) (corral or loafing barn)	6.6	25.1
Calf (< 3 mo) (on-ground calf hutches)	6.2	23.6
Calf (< 3 mo) (Above- ground calf hutches)	6.7	23.6
Mature Bull (corral)	11.1	42.6

<sup>3</sup> The emission factor for the milk cow is based on an internal document entitled "*Breakdown of Dairy VOC Emission Factor into Permit Units*". The emission factor for the other cows were developed by taking the ratio of manure generated by the different types of cows to the milk cow and multiplying it by the milk cow VOC emission factor.

<sup>4</sup> This emission factor is taken directly from the "APCO's Determination of VOC Emission Factors for Dairies" report.

Pre-Project and Post-Project Emissions for Dairy 1

<b>Milk Parlor Emission Factors<sup>3</sup></b>		
Permit Units	VOC Emissions (lb/cow-yr)	NH <sub>3</sub> Emissions (lb/cow-yr)
Milking Center (Open Corral)	0.9	1.3

<b>Cow Housing Emission Factors for Dairy Cows<sup>3</sup></b>		
Type of Cow	Open Corral Housing	
	(lb-VOC/cow-yr)	(lb-NH <sub>3</sub> /cow-yr)
Milk Cow	12.4	32.3
Dry Cow	8.2	20.6
Heifer (15 to 24 months)	5.7	14.4
Heifer (7 to 14 months)	5.0	12.6
Heifer (4 to 6 months)	4.5	11.4
Calf (under 3 months)	4.3	10.7
Mature Bull	7.7	19.3

<b>Lagoon/Storage Pond Emission Factors for Dairy Cows<sup>3</sup></b>		
Type of Cow and Housing	(lb-VOC/cow-yr)	(lb-NH <sub>3</sub> /cow-yr)
Milk Cow (Freestalls)	2.7	15.7
Milk Cow (Corral/Loafing)	2.3	15.5
Dry Cow (Corral/Loafing)	1.4	9.5
Heifer (15 to 24 months) (Corral/Loafing)	1.0	6.7
Heifer (7 to 14 months) (Corral/Loafing)	0.9	5.8
Heifer (4 to 6 months) (Corral/Loafing)	0.8	5.3
Calf (under 3 months) (Above-ground Hutches)	0.9	5.0
Calf (under 3 months) (On-ground Hutches)	0.7	4.9
Mature Bull (Open Corral)	1.3	8.9

<b>Land Application Emission Factors for Dairy Cows<sup>3</sup></b>		
Type of Cow and Housing	(lb-VOC/cow-yr)	(lb-NH <sub>3</sub> /cow-yr)
Milk Cow (Freestalls)	5.0	29.1

Milk Cow (Corral/Loafing)	3.7	24.9
Dry Cow (Corral/Loafing)	2.3	15.3
Heifer (15 to 24 months) (Corral/Loafing)	1.6	10.7
Heifer (7 to 14 months) (Corral/Loafing)	1.4	9.3
Heifer (4 to 6 months) (Corral/Loafing)	1.3	8.5
Calf (under 3 months) (Above-ground Hutches)	1.6	9.3
Calf (under 3 months) (On-ground Hutches)	1.2	7.9
Mature Bull (Open Corral)	2.1	14.3

**Post Project Emissions for Dairy 2**

<b>Milk Parlor Emission Factors<sup>3</sup></b>		
Permit Units	VOC Emissions (lb/cow-yr)	NH <sub>3</sub> Emissions (lb/cow-yr)
Milking Center (Open Corral)	0.9	1.3
Milking Center (Freestall)	0.9	1.2

<b>Cow Housing Emission Factors for Dairy Cows<sup>3</sup></b>		
Type of Cow	(lb-VOC/cow-yr)	(lb-NH <sub>3</sub> /cow-yr)
Milk Cow (Freestalls)	12.4	28.0
Milk Cow (Corral/Loafing)	12.4	32.3
Dry Cow (Corral/Loafing)	8.2	20.6
Heifer (15 to 24 months) (Corral/Loafing)	5.7	14.4
Heifer (7 to 14 months) (Corral/Loafing)	5.0	12.6
Heifer (4 to 6 months) (Corral/Loafing)	4.5	11.4
Calf (under 3 months) (Above-ground Hutches)	4.3	9.3
Calf (under 3 months) (On-ground Hutches)	4.3	10.7
Mature Bull (Open Corral)	7.7	19.3

<b>Lagoon/Storage Pond Emission Factors for Dairy Cows<sup>3</sup></b>		
Type of Cow and Housing	(lb-VOC/cow-yr)	(lb-NH <sub>3</sub> /cow-yr)
Milk Cow (Freestall)	2.7	15.7
Milk Cow (Open Corral)	2.3	15.5
Dry Cow (Open Corral)	1.4	9.5
Heifer (15 to 24 months) (Open Corral)	1.0	6.7
Heifer (7 to 14 months) (Open Corral)	0.9	5.8
Heifer (4 to 6 months) (Open Corral)	0.8	5.3
Calf (under 3 months) (Above-ground Hutches)	0.9	5.0
Calf (under 3 months) (On-ground Hutches)	0.7	4.9
Mature Bull (Open Corrals)	1.3	8.9

<b>Land Application Emission Factors for Dairy Cows<sup>3</sup></b>		
Type of Cow and Housing	(lb-VOC/cow-yr)	(lb-NH <sub>3</sub> /cow-yr)
Milk Cow (Freestall)	5.0	29.1
Milk Cow (Open Corral)	3.7	24.9
Dry Cow (Open Corral)	2.3	15.3
Heifer (15 to 24 months) (Open Corral)	1.6	10.7
Heifer (7 to 14 months) (Open Corral)	1.4	9.3
Heifer (4 to 6 months) (Open Corral)	1.3	8.5
Calf (under 3 months) (Above-ground Hutches)	1.6	9.3
Calf (under 3 months) (On-ground Hutches)	1.2	7.9
Mature Bull (Open Corral)	2.1	14.3

#### Solid Manure Handling

An emissions factor for solid manure has not yet been fully established. Results of emissions studies by Dr. C.E. Schmidt at a Merced dairy indicate that VOC

and NH<sub>3</sub> emissions from solid manure at a dairy are minimal.<sup>5</sup> Therefore, although some emissions reductions are expected from the required mitigation measures, they will not be quantified at this time.

Feed Handling and Storage

Although there are potentially significant emissions from the feed handling and storage operation, an emission factor has not been established and will not be calculated in this evaluation. Subsequently, although emissions reductions from the proposed mitigation measures are expected, they will not be quantified at this time.

Hydrogen Sulfide (H<sub>2</sub>S)

Currently, there is no approved emission factor or data for Hydrogen Sulfide (H<sub>2</sub>S) emissions. Therefore, H<sub>2</sub>S emissions will not be calculated for this project. The District expects that research will be completed in the near future, which may be used to establish an emission factor for Hydrogen Sulfide.

**Calculations**

**1. Pre-Project Potential to Emit (PE1)**

Milking Parlor (C-5203-1-0)

The pre-project emissions from the milking parlor are calculated as follows:

VOC

PE1 for VOC from the Milking Parlor (Permit C-5203-1-0)				
Type of Cow	# of Cows	Uncontrolled EF (lb-VOC/hd-yr)	Control(s)	Emissions (lb-VOC/yr)
Milk Cows	2,904	x 0.9		<b>2,614</b>
<b>PE1 for VOC from the Milking Parlor</b>				<b>lb/day</b> = lb/yr ÷ (365 day/yr) <b>7.2</b>

NH<sub>3</sub>

$$PE1_{NH_3} = (2,904 \text{ milk cows}) \times (1.3 \text{ lb-NH}_3/\text{cow-year})$$

$$= \mathbf{3,775 \text{ lb-NH}_3/\text{year}}$$

$$PE1_{NH_3} = (3,775 \text{ lb-NH}_3/\text{year}) \div (365 \text{ day/year})$$

<sup>5</sup> "Assessment of Reactive Organic Gases and Amines from a Northern California Dairy Using the USEPA Surface Emission Isolation Flux Chamber", CE Schmidt, Tom Card, EMC, and Patrick Gaffney, CARB (<http://www.valleyair.org/Workshops/postings/03-23-05/LivestockSymposiumCES.pdf>)

= 10.3 lb-NH<sub>3</sub>/day

<b>Pre-Project Potential to Emit (PE1) C-5203-1-0</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	0	0
CO	0	0
VOC	7.2	2,614
NH <sub>3</sub>	10.3	3,775

Cow Housing (C-5203-2-0)

Pre-project PM<sub>10</sub> emissions from the cow-housing permit will be based on the uncontrolled PM<sub>10</sub> emission factors given in Section VII.B above.

Pre-Project Potential to Emit (PE1) for the cow housing permit unit will be calculated in the tables below.

<b>PE1 from the Cow Housing Permit (Permit C-5203-2-0)</b>									
Type of Cow	# of Cows		EF <sub>PM10</sub> (lb/cow)	EF <sub>VOC</sub> (lb/cow)	EF <sub>NH3</sub> (lb/cow)		lb-PM <sub>10</sub> /yr	lb-VOC/yr	lb-NH <sub>3</sub> /yr
Milk Cow (Open Corral)	2,904	x	4.55			=	13,213		
				12.4				36,010	
					32.3				93,799
Dry Cow (Open Corral)	443	x	5.46			=	2,419		
				8.2				3,633	
					20.6				9,126
Heifer (15-24 month) (Open Corral)	276	x	9.67			=	2,669		
				5.7				1,573	
					14.4				3,974
Heifer (7-14 month) (Open Corral)	1,553	x	9.67			=	15,018		
				5.0				7,765	
					12.6				19,568
Heifer (4-6 month) (Open Corral)	421	x	9.67			=	4,071		
				4.5				1,895	
					11.4				4,799
Calf (under 3 month)	606	x	0.34			=	206		
				4.3				2,606	

(Calf Hutches)				10.7			6,484	
Bull (Open Corral)	1	x	9.67		=	10		
				7.7			8	
				19.3			19	
<b>PE1 from the Cow Housing</b>				<b>lb/yr</b>		<b>37,606</b>	<b>53,490</b>	<b>137,769</b>
				<b>lb/day</b> = lb/yr ÷ (365 day/yr)		<b>103.0</b>	<b>146.5</b>	<b>377.4</b>

Total Pre Project Emissions from the Cow Housing Permit Unit (C-5203-2-0):

<b>Pre-Project Potential to Emit (PE1) C-5203-2-0</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	103.0	37,606
CO	0	0
VOC	146.5	53,490
NH <sub>3</sub>	377.4	137,769

Liquid Manure Handling System (C-5203-3-0: Lagoon, Storage Pond, and Liquid Manure Land Application)

Lagoons/Storage Ponds:

Pre-Project Potential to Emit (PE1) for the lagoons/storage ponds will be calculated in the table below.

<b>Pre-Project Potential to Emit (PE1) from Lagoons/Storage Ponds (Permit C-5203-3-0)</b>							
Type of Cow	# of Cows		EF <sub>VOC</sub> (lb/cow)	EF <sub>NH3</sub> (lb/cow)		lb-VOC/yr	lb-NH <sub>3</sub> /yr
Milk Cow (Open Corral)	2,904	x	2.3		=	6,679	
				15.5			45,012
Dry Cow (Open Corral)	443	x	1.4		=	620	
				9.5			4,209
Heifer (15-24 mo.) (Open Corral)	276	x	1.0		=	276	
				6.7			1,849
Heifer	1,553	x	0.9		=	1,398	

(7-14 mo.) (Open Corral)			5.8			9,007
Heifer (4-6 mo.) (Open Corral)	421	x	0.8	=	337	2,231
			5.3			
Calf (under 3 mo.) (Hutches)	606	x	0.7	=	424	2,969
			4.9			
Mature Bulls (Open Corral)	1	x	1.3	=	1	9
			8.9			
<b>PE1 from Lagoons/Storage Ponds</b>			<b>lb/yr</b>		<b>9,735</b>	<b>65,287</b>
			<b>lb/day</b> = lb/yr ÷ (365 day/yr)		<b>26.7</b>	<b>178.9</b>

Liquid Manure Land Application:

Pre-Project Potential to Emit (PE1) for liquid manure land application will be calculated in the table below.

<b>Pre-Project Potential to Emit (PE1) from Liquid Manure Land Application (Permit C-5203-3-0)</b>						
<b>Type of Cow</b>	<b># of Cows</b>		<b>EF<sub>VOC</sub></b> (lb/cow)	<b>EF<sub>NH3</sub></b> (lb/cow)		<b>lb-VOC/yr</b> <b>lb-NH<sub>3</sub>/yr</b>
Milk Cow (Open Corral)	2,904	x	3.7	24.9	=	10,745 72,310
Dry Cow (Open Corral)	443	x	2.3	15.3	=	1,019 6,778
Heifer (15-24 mo.) (Open Corral)	276	x	1.6	10.7	=	442 2,953
Heifer (7-14 mo.) (Open Corral)	1553	x	1.4	9.3	=	2,174 14,443
Heifer (4-6 mo.) (Open Corral)	421	x	1.3	8.5	=	547 3,579
Calf (under 3 mo.) (Hutches)	606	x	1.2	7.9	=	727 4,787
Mature Bulls (open Corrals)	1	x	2.1	14.3	=	2 14
<b>PE1 from Liquid Manure Land Application</b>			<b>lb/yr</b>		<b>15,656</b>	<b>104,864</b>
			<b>lb/day</b> = lb/yr ÷ (365 day/yr)		<b>42.9</b>	<b>287.3</b>

Total Pre-Project Emissions from Liquid Manure Handling System (C-5203-3-0):

$$PE1_{VOC} = 9,735 \text{ lb-VOC/year} + 15,656 \text{ lb-VOC/year} \\ = \mathbf{25,391 \text{ lb-VOC/year}}$$

$$PE1_{VOC} = (25,391 \text{ lb-VOC/year}) \div (365 \text{ day/year}) \\ = \mathbf{69.6 \text{ lb-VOC/day}}$$

$$PE1_{NH_3} = 65,287 \text{ lb-NH}_3\text{/year} + 104,864 \text{ lb-NH}_3\text{/year} \\ = \mathbf{170,151 \text{ lb-NH}_3\text{/year}}$$

$$PE1_{NH_3} = (170,151 \text{ lb-NH}_3\text{/year}) \div (365 \text{ day/year}) \\ = \mathbf{466.2 \text{ lb-NH}_3\text{/day}}$$

<b>Pre-Project Potential to Emit (PE1) C-5203-3-0</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	0	0
CO	0	0
VOC	69.6	25,391
NH <sub>3</sub>	466.2	170,151

Solid Manure Handling System (C-5203-4-0)

An emissions factor for solid manure has not yet been fully established. Based on the currently available information, the pre-project emissions from the solid manure are considered negligible and are set to 0.0 lb/day for all affected pollutants.

Liquid Manure Handling System (C-5203-9-0: Lagoon, Storage Pond, and Liquid Manure Land Application)

Lagoons/Storage Ponds:

Pre-Project Potential to Emit (PE1) for the lagoons/storage ponds will be calculated in the table below.

<b>Pre-Project Potential to Emit (PE1) from Lagoons/Storage Ponds (Permit C-5203-9-0)</b>						
Type of Cow	# of Cows		EF <sub>VOC</sub> (lb/cow)	EF <sub>NH3</sub> (lb/cow)		lb-VOC/yr lb-NH <sub>3</sub> /yr
Milk Cow	6,600	x	2.7		=	17,820

(Freestall)			15.7			103,620
Milk Cow (Loafing Barn)	200	x	2.3		=	460
				15.5		3,100
Dry Cow (Loafing Barn)	1,000	x	1.4		=	1,400
				9.5		9,500
Heifer (15-24 mo.) (Corral/Loafing)	2,200	x	1.0		=	2,200
				6.7		14,740
Heifer (7-14 mo.) (Corral/Loafing)	1,800	x	0.9		=	1,620
				5.8		10,440
Heifer (4-6 mo.) (Loafing Barn)	700	x	0.8		=	560
				5.3		3,710
Calf (< 3 mo.) (Above-ground Hutches)	1,000	x	0.9		=	900
				5.0		5,000
Mature Bulls (Open Corrals)	10	x	1.3		=	13
				8.9		89
<b>PE1 from Lagoons/Storage Ponds</b>			<b>lb/yr</b>			<b>24,973</b>
			<b>lb/day</b> = lb/yr ÷ (365 day/yr)			<b>68.4</b>

Liquid Manure Land Application:

Pre-Project Potential to Emit (PE1) for liquid manure land application will be calculated in the table below.

<b>Pre-Project Potential to Emit (PE1) from Liquid Manure Land Application (Permit C-5203-9-0)</b>						
Type of Cow	# of Cows		EF <sub>VOC</sub> (lb/cow)	EF <sub>NH3</sub> (lb/cow)		lb-VOC/yr lb-NH <sub>3</sub> /yr
Milk Cow (Freestall)	6,600	x	5.0		=	33,000
				29.1		192,060
Milk Cow (Loafing Barn)	200	x	3.7		=	740
				24.9		4,980
Dry Cow (Loafing Barn)	1,000	x	2.3		=	2,300
				15.3		15,300
Heifer (15-24 mo.) (Corral/Loafing)	2,200	x	1.6		=	3,520
				10.7		23,540
Heifer	1,800	x	1.4		=	2,520

(7-14 mo.) (Corral/Loafing)				9.3			16,740
Heifer (4-6 mo.) (Loafing Barn)	700	x	1.3		=	910	
				8.5			5,950
Calf (< 3 mo.) (Above-ground Hutches)	1,000	x	1.6		=	1,600	
				9.3			9,300
Mature Bulls (Open Corrals)	10	x	2.1		=	21	
				14.3			143
<b>PE1 from Liquid Manure Land Application</b>			<b>lb/yr</b>			<b>44,611</b>	<b>268,013</b>
			<b>lb/day</b> = lb/yr ÷ (365 day/yr)			<b>122.2</b>	<b>734.3</b>

Total Pre-Project Emissions from Liquid Manure Handling System (C-5203-9-0):

$$PE1_{VOC} = 24,973 \text{ lb-VOC/year} + 44,611 \text{ lb-VOC/year} = \mathbf{69,584 \text{ lb-VOC/year}}$$

$$PE1_{VOC} = (69,584 \text{ lb-VOC/year}) \div (365 \text{ day/year}) = \mathbf{190.6 \text{ lb-VOC/day}}$$

$$PE1_{NH_3} = 150,199 \text{ lb-NH}_3\text{/year} + 268,013 \text{ lb-NH}_3\text{/year} = \mathbf{418,212 \text{ lb-NH}_3\text{/year}}$$

$$PE1_{NH_3} = (418,212 \text{ lb-NH}_3\text{/year}) \div (365 \text{ day/year}) = \mathbf{1,145.8 \text{ lb-NH}_3\text{/day}}$$

<b>Pre-Project Potential to Emit (PE1) C-5203-9-0</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	0	0
CO	0	0
VOC	190.6	69,584
NH <sub>3</sub>	1,145.8	418,212

Feed Storage and Handling Permit Unit (C-5203-11-0)

An emissions factor for feed has not yet been developed. Therefore, emissions from feed will not be quantified in this evaluation.

## 2. Post Project Potential to Emit (PE2)

Post-Project Potential to Emit (PE2) for the dairy will be calculated below based on the maximum design capacity for each type of cow at the dairy and the controls required and proposed by the dairy.

### Milking Parlor (C-5203-1-2)

As a condition of approval, this dairy will be required to feed all animals at the dairy in accordance with NRC guidelines. This dairy will also be required to flush the milking parlor after each milking. Therefore, the control efficiency for these practices will be used to calculate post-project VOC emissions from the milking parlor.

The post-project emissions from the milking parlor are calculated as follows:

### VOC

PE2 for VOC from the Milking Parlor (Permit C-5203-1-2)					
Type of Cow	# of Cows	Uncontrolled EF (lb-VOC/hd-yr)	Control(s)		Emissions (lb-VOC/yr)
Milk Cows	2,600	x 0.9	Feeding to NRC guidelines (5%)	Flushing/Spraying down milk parlor after each milking (16.7%)	1,852
			x (1 - 0.05 )	x (1 - 0.167 ) =	
<b>PE2 for VOC from the Milking Parlor</b>					<b>lb/day</b> = lb/yr ÷ (365 day/yr)
					<b>5.1</b>

### NH<sub>3</sub>

$$PE2_{NH_3} = (2,600 \text{ milk cows}) \times (1.3 \text{ lb-NH}_3/\text{cow-year})$$

$$= \mathbf{3,380 \text{ lb-NH}_3/\text{year}}$$

$$PE2_{NH_3} = (3,380 \text{ lb-NH}_3/\text{year}) \div (365 \text{ day/year})$$

$$= \mathbf{9.3 \text{ lb-NH}_3/\text{day}}$$

<b>Post-Project Potential to Emit (PE2) C-5203-1-2</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	0	0
CO	0	0
VOC	5.1	1,852
NH <sub>3</sub>	9.3	3,380

Cow Housing (C-5203-2-2)

VOC

As a condition of approval, this dairy will be required to feed all animals in accordance with NRC guidelines. This dairy will also be required to flush the freestalls for milk cows and dry cows at least four times per day. Therefore, the control efficiencies for feeding all animals in accordance with NRC guidelines and flushing the freestall lanes four times per day will be used to calculate post-project VOC emissions from the cow housing permit unit.

The post-project VOC emissions from the cow housing permit unit are calculated in the table below:

<b>PE2 for VOC from the Cow Housing Permit (Permit C-5203-2-2)</b>					
Type of Cow	# of Cows	Uncontrolled EF (lb-VOC/hd-yr)	Control(s)		Emissions (lb-VOC/yr)
Milk Cow (Open Corral)	2,600	12.4	Feeding to NRC guidelines (5%)	Flushing freestall lanes four times per day (18.2%)	<b>25,054</b>
			x (1 - 0.05 )	x (1 - 0.182 ) =	
Dry Cow (Open Corral)	500	8.2	Feeding to NRC guidelines (5%)	Flushing corral lanes four times per day (18.2%)	<b>3,186</b>
			x (1 - 0.05 )	x (1 - 0.182 ) =	
Heifer (15-24 mo.) (Open Corral)	1,000	5.7	Feeding to NRC guidelines (5%)	Flushing corral lanes two times per day (0%)	<b>5,415</b>
			x (1 - 0.05 )	x (1 - 0 ) =	
Heifer (7 - 14 mo.) (Open Corral)	800	5.0	Feeding to NRC guidelines (5%)	Flushing corral lanes two times per day (0%)	<b>3,800</b>
			x (1 - 0.05 )	x (1 - 0 ) =	
			Feeding to NRC guidelines (5%)	Flushing corral lanes two times per day (0%)	

(4 - 6 mo.) (Open Corral)	400	4.5	x (1 - 0.05 )	x (1 - 0 ) =	<b>1,710</b>
Calves (<3 mo.) (on-ground Hutch)	300	4.3	Feeding to NRC guidelines (5%)	Flushing corral lanes two times per day (0%)	<b>1,226</b>
			x (1 - 0.05 )	x (1 - 0 ) =	
Mature Bulls (Open Corral)	10	7.7	Feeding to NRC guidelines (5%)	Flushing corral lanes two times per day (0%)	<b>73</b>
			x (1 - 0.05 )	x (1 - 0 ) =	
<b>PE2 for VOC from the Cow Housing Permit</b>				<b>lb/yr</b>	<b>40,464</b>
				<b>lb/day</b> = lb/yr ÷ (365 day/yr)	<b>110.9</b>

### PM<sub>10</sub> and NH<sub>3</sub>

As a condition of approval, this dairy will be required to plant trees upwind of the dairy for the heifers (7-14 months) in accordance with the NRCS specifications and standards. In addition, the applicant will feed cattle near dusk, scrape the open corrals weekly in the morning hours, and sprinkle water over 66% of the heifer corrals (7-24 months) area to match the evaporation rate to keep constant moisture content in the soil. Therefore, the post-project PM<sub>10</sub> emissions from the cow-housing permit will be based on the controlled PM<sub>10</sub> emission factors given in Section VII.B above.

The post-project PM<sub>10</sub> and NH<sub>3</sub> emissions from the cow housing permit unit are calculated in the table below:

<b>PE2 for PM<sub>10</sub> and NH<sub>3</sub> from the Cow Housing Permit (Permit C-5203-2-2)</b>						
Type of Cow	# of Cows		EF <sub>PM10</sub> (lb/cow)	EF <sub>NH3</sub> (lb/cow)		lb-PM <sub>10</sub> /yr
Milk Cow (Open Corral)	2,600	x	3.87		=	10,062
				32.3		83,980
Dry Cow (Open Corral)	500	x	4.64		=	2,320
				20.6		11,946
Heifer (15-24 mo.) (Open Corral)	1,000	x	4.96		=	4,960
				14.4		14,400
Heifer (7-14 mo.) (Open Corral)	800	x	4.46		=	3,568
				12.6		10,080
Heifer (4-6 mo.) (Open Corral)	400	x	7.4		=	2,960
				11.4		4,560
Calf (under 3 mo.) (Hutches)	300	x	0.34		=	102
				10.7		3,210
Mature Bulls	10	x	8.22		=	82

(Open Corrals)		19.3		193
<b>PE2 for PM<sub>10</sub> and NH<sub>3</sub> from the Cow Housing</b>		<b>lb/yr</b>	<b>24,054</b>	<b>128,369</b>
		<b>lb/day</b> = lb/yr ÷ (365 day/yr)	<b>65.9</b>	<b>369.7</b>

Total Post Project Emissions from the Cow Housing Permit Unit (C-5203-2-2):

<b>Post-Project Potential to Emit (PE2) C-5203-2-2</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	65.9	24,054
CO	0	0
VOC	110.9	40,464
NH <sub>3</sub>	369.7	128,369

Liquid Manure Handling System (C-5203-3-2: Lagoon, Storage Pond, and Liquid Manure Land Application)

Lagoons/Storage Ponds:

VOC

As a condition of approval, this dairy will be required to feed all animals at the dairy in accordance to NRC guidelines. Therefore, the control efficiency for feeding all animals in accordance with NRC guidelines will be used to calculate post-project VOC emissions from the lagoons/storage ponds.

The post-project VOC emissions from the lagoons/storage ponds are calculated in the table below:

<b>PE2 for VOC from Lagoons/Storage Ponds (Permit C-5203-3-2)</b>					
Type of Cow	# of Cows	Uncontrolled EF (lb-VOC/hd-yr)	Control(s)		Emissions (lb-VOC/yr)
Milk Cow (Open Corral)	2,600	2.3	Feeding to NRC guidelines (5%)		<b>5,681</b>
			x (1 - 0.05 )		
Dry Cow (Open Corral)	500	1.4	Feeding to NRC guidelines (5%)		<b>665</b>
			x (1 - 0.05 )		
Heifer			Feeding to NRC guidelines (5%)		

(15-24 mo.) (Open Corral)	1,000	1.0	x (1 - 0.05 )		<b>950</b>
Heifer (7 - 14 mo.) (Open Corral)	800	0.9	Feeding to NRC guidelines (5%) x (1 - 0.05 )		<b>684</b>
Heifer (4 - 6 mo.) (Open Corral)	400	0.8	Feeding to NRC guidelines (5%) x (1 - 0.05 )		<b>304</b>
Calves (<3 mo.) (on- ground Hutch)	300	0.7	Feeding to NRC guidelines (5%) x (1 - 0.05 )		<b>200</b>
Mature Bulls (Open Corral)	10	1.3	Feeding to NRC guidelines (5%) x (1 - 0.05 )		<b>12</b>
<b>PE2 for VOC from Lagoons/Storage Ponds</b>				<b>lb/yr</b>	<b>8,496</b>
				<b>lb/day</b> = lb/yr ÷ (365 day/yr)	<b>23.3</b>

### NH<sub>3</sub>

The post-project NH<sub>3</sub> emissions from the lagoons/storage ponds are calculated in the table below:

<b>PE2 for NH<sub>3</sub> from Lagoon/Storage Ponds (Permit C-5203-3-2)</b>					
<b>Type of Cow</b>	<b># of Cows</b>		<b>EF<sub>NH3</sub></b> (lb/cow)		<b>lb-NH<sub>3</sub>/yr</b>
Milk Cow (Open Corral)	2,600	x	15.5	=	40,300
Dry Cow (Open Corral)	500	x	9.5	=	4,750
Heifer (15-24 mo.) (Open Corral)	1,000	x	6.7	=	6,700
Heifer (7-14 mo.) (Open Corral)	800	x	5.8	=	4,640
Heifer (4-6 mo.) (Open Corral)	400	x	5.3	=	2,120
Calf (under 3 mo.) (On-ground Hutch)	300	x	4.9	=	1,470
Mature Bulls (Open Corral)	10	x	8.9	=	89

<b>PE2 for NH<sub>3</sub> from Lagoon/Storage Ponds</b>	<b>lb/yr</b>	<b>60,069</b>
	<b>lb/day</b> = lb/yr ÷ (365 day/yr)	<b>164.6</b>

Liquid Manure Land Application:

VOC

As a condition of approval, this dairy will be required to feed all animals at the dairy in accordance with the NRC guidelines. Therefore, the control efficiency for feeding all animals in accordance with NRC guidelines will be used to calculate post-project VOC emissions from liquid manure land application.

The post-project VOC emissions from liquid manure land application are calculated in the table below:

<b>PE2 for VOC from Liquid Manure Land Application (Permit C-5203-3-2)</b>					
<b>Type of Cow</b>	<b># of Cows</b>	<b>Uncontrolled EF (lb-VOC/hd-yr)</b>	<b>Control(s)</b>		<b>Emissions (lb-VOC/yr)</b>
Milk Cow (Open Corral)	2,600	3.7	Feeding to NRC guidelines (5%)		9,139
			x	(1 - 0.05 )	
Dry Cow (Open Corral)	500	2.3	Feeding to NRC guidelines (5%)		1,093
			x	(1 - 0.05 )	
Heifer (15-24 mo.) (Open Corral)	1,000	1.6	Feeding to NRC guidelines (5%)		1,520
			x	(1 - 0.05 )	
Heifer (7 - 14 mo.) (Open Corral)	800	1.4	Feeding to NRC guidelines (5%)		1,064
			x	(1 - 0.05 )	
Heifer (4 - 6 mo.) (Open Corral)	400	1.3	Feeding to NRC guidelines (5%)		494
			x	(1 - 0.05 )	
Calves (<3 mo.) (on-ground Hutch)	300	1.2	Feeding to NRC guidelines (5%)		342
			x	(1 - 0.05 )	
Mature Bulls (Open Corral)	10	2.1	Feeding to NRC guidelines (5%)		20
			x	(1 - 0.05 )	
<b>PE2 for VOC from Liquid Manure Land Application</b>				<b>lb/yr</b>	<b>13,672</b>

	<b>lb/day</b> = lb/yr ÷ (365 day/yr)	<b>37.5</b>
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NH<sub>3</sub>

The post-project NH<sub>3</sub> emissions from liquid manure land application are calculated in the table below:

<b>PE2 for NH<sub>3</sub> from Land Application (Permit C-5203-3-2)</b>					
Type of Cow	# of Cows		EF <sub>NH<sub>3</sub></sub> (lb/cow)		lb-NH <sub>3</sub> /yr
Milk Cow (Open Corral)	2,600	x	24.9	=	64,740
Dry Cow (Open Corral)	500	x	15.3	=	7,650
Heifer (15-24 mo.) (Open Corral)	1,000	x	10.7	=	10,700
Heifer (7-14 mo.) (Open Corral)	800	x	9.3	=	7,440
Heifer (4-6 mo.) (Open Corral)	400	x	8.5	=	3,400
Calf (under 3 mo.) (On-ground Hutch)	300	x	7.9	=	2,370
Mature Bulls (Open Corral)	10	x	14.3	=	143
<b>PE2 for NH<sub>3</sub> from Land Application</b>			<b>lb/yr</b>		<b>96,443</b>
			<b>lb/day</b> = lb/yr ÷ (365 day/yr)		<b>264.2</b>

Total Post-Project Emissions from Liquid Manure Handling System (C-5203-3-2):

$$PE2_{VOC} = 8,496 \text{ lb-VOC/year} + 13,672 \text{ lb-VOC/year}$$

$$= \mathbf{22,168 \text{ lb-VOC/year}}$$

$$PE2_{VOC} = (22,168 \text{ lb-VOC/year}) \div (365 \text{ day/year})$$

$$= \mathbf{60.7 \text{ lb-VOC/day}}$$

$$PE2_{NH_3} = 60,069 \text{ lb-NH}_3/\text{year} + 96,443 \text{ lb-NH}_3/\text{year}$$

$$= \mathbf{156,512 \text{ lb-NH}_3/\text{year}}$$

$$PE2_{NH_3} = (221,165 \text{ lb-NH}_3/\text{year}) \div (365 \text{ day/year})$$

$$= \mathbf{428.9 \text{ lb-NH}_3/\text{day}}$$

<b>Post-Project Potential to Emit (PE2) C-5203-3-2</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	0	0
CO	0	0
VOC	60.7	22,168
NH <sub>3</sub>	428.9	156,512

Solid Manure Handling System (C-5203-4-2 and -10-1)

An emissions factor for solid manure has not yet been fully established. Based on the currently available information, the post-project emissions from the solid manure are considered negligible and are set to 0.0 lb/day for all affected pollutants.

Milking Parlor (C-5203-7-0)

As a condition of approval, this dairy will be required to feed all animals at the dairy in accordance with NRC guidelines. This dairy will also be required to flush the milking parlor after each milking. Therefore, the control efficiency for these practices will be used to calculate post-project VOC emissions from the milking parlor.

The post-project emissions from the milking parlor are calculated as follows:

VOC

<b>PE2 for VOC from the Milking Parlor (Permit C-5203-7-0)</b>					
Type of Cow	# of Cows	Uncontrolled EF (lb-VOC/hd-yr)	Control(s)		Emissions (lb-VOC/yr)
Milk Cows	6,800	x 0.9	Feeding to NRC guidelines (5%)	Flushing/Spraying down milk parlor after each milking (16.7%)	<b>4,843</b>
			x (1 - 0.05 )	x (1 - 0.167 ) =	
<b>PE2 for VOC from the Milking Parlor</b>					<b>lb/day</b> = lb/yr ÷ (365 day/yr)
					<b>13.3</b>

NH<sub>3</sub>

$$\begin{aligned}
 PE2_{NH_3} &= (6,600 \text{ milk cows}) \times (1.2 \text{ lb-NH}_3/\text{cow-year}) + (200 \text{ milk cows}) \times (1.3 \\
 &\quad \text{lb-NH}_3/\text{cow-year}) \\
 &= \mathbf{8,180 \text{ lb-NH}_3/\text{year}}
 \end{aligned}$$

$$PE2_{NH_3} = (8,180 \text{ lb-NH}_3/\text{year}) \div (365 \text{ day/year})$$

$$= 22.4 \text{ lb-NH}_3/\text{day}$$

<b>Post-Project Potential to Emit (PE2) C-5203-7-0</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	0	0
CO	0	0
VOC	13.3	4,843
NH <sub>3</sub>	22.4	8,180

Cow Housing (C-5203-8-0)

VOC

As a condition of approval, this dairy will be required to feed all animals in accordance with NRC guidelines. This dairy will also be required to flush the freestalls for milk cows and dry cows at least four times per day. Therefore, the control efficiencies for feeding all animals in accordance with NRC guidelines and flushing the freestall lanes four times per day will be used to calculate post-project VOC emissions from the cow housing permit unit.

The post-project VOC emissions from the cow housing permit unit are calculated in the table below:

<b>PE2 for VOC from the Cow Housing Permit (Permit C-5203-8-0)</b>					
Type of Cow	# of Cows	Uncontrolled EF (lb-VOC/hd-yr)	Control(s)		Emissions (lb-VOC/yr)
Milk Cow (Freestall)	6,800	12.4	Feeding to NRC guidelines (5%)	Flushing freestall lanes four times per day (18.2%)	<b>65,525</b>
			x (1 - 0.05 )	x (1 - 0.182 ) =	
Dry Cow (Loafing)	1,000	8.2	Feeding to NRC guidelines (5%)	Flushing corral lanes two times per day (0%)	<b>6,372</b>
			x (1 - 0.05 )	x (1 - 0.182 ) =	
Heifer (15-24 mo.) (corral/loafing)	2,200	5.7	Feeding to NRC guidelines (5%)	Flushing corral lanes two times per day (0%)	<b>11,913</b>
			x (1 - 0.05 )	x (1 - 0 ) =	
			Feeding to NRC guidelines (5%)	Flushing corral lanes two times per day (0%)	

(7 - 14 mo.) (corral/loafing)	1,800	5.0	x (1 - 0.05 )	x (1 - 0 ) =	<b>8,550</b>
Heifers (4 - 6 mo.) (Loafing)	700	4.5	Feeding to NRC guidelines (5%) x (1 - 0.05 )	Flushing corral lanes two times per day (0%) x (1 - 0 ) =	<b>2,993</b>
Calves (< 3 mo.) (above Hutch)	1,000	4.3	Feeding to NRC guidelines (5%) x (1 - 0.05 )	Flushing corral lanes two times per day (0%) x (1 - 0 ) =	<b>4,085</b>
Mature Bulls (Open Corral)	10	7.7	Feeding to NRC guidelines (5%) x (1 - 0.05 )	Flushing corral lanes two times per day (0%) x (1 - 0 ) =	<b>73</b>
<b>PE2 for VOC from the Cow Housing Permit</b>				<b>lb/yr</b>	<b>99,511</b>
				<b>lb/day</b> = lb/yr ÷ (365 day/yr)	<b>272.6</b>

PM<sub>10</sub> and NH<sub>3</sub>

As a condition of approval, this dairy will be required to plant trees (shelterbelt) around the entire dairy in accordance with the NRCS specifications and standards. In addition, the applicant will install shade structures in all open corrals, feed cattle near dusk, scrape the open corrals and freestall exercise pens weekly in the morning hours, construct freestalls such that there are no exercise pens, and sprinkle water over 71% of the heifer corrals area to match the evaporation rate to keep constant moisture content in the soil. Therefore, the post-project PM<sub>10</sub> emissions from the cow-housing permit will be based on the controlled PM<sub>10</sub> emission factors given in Section VII.B above.

The post-project PM<sub>10</sub> and NH<sub>3</sub> emissions from the cow housing permit unit are calculated in the table below:

<b>PE2 for PM<sub>10</sub> and NH<sub>3</sub> from the Cow Housing Permit (Permit C-5203-8-0)</b>						
Type of Cow	# of Cows		EF <sub>PM10</sub> (lb/cow)	EF <sub>NH3</sub> (lb/cow)		lb-PM <sub>10</sub> /yr
Milk Cow (Freestall)	6,600	x	0.24	28.0	=	1,584
						184,800
Milk Cow (Loafing Barn)	200	x	3.05	32.3	=	610
						6,460
Dry Cow (Loafing Barn)	1,000	x	3.05	20.6	=	3,050
						20,600
Heifer (15-24 mo.) (Open Corral)	1,900	x	3.70	14.4	=	7,030
						27,360
Heifer (15-24 mo.)	300	x	4.69		=	1,407

(Loafing Barn)				14.4			4,320
Heifer (7-14 mo.) (Open Corral)	1,700	x	3.70		=	6,290	
				12.6			21,420
Heifer (7-14 mo.) (Loafing Barn)	100	x	4.69		=	469	
				12.6			1,260
Heifer (4-6 mo.) (Loafing barn)	700	x	4.69		=	3,283	
				11.4			7,980
Calf (under 3 mo.) (Above Hutches)	1,000	x	0.05		=	50	
				9.3			9,300
Mature Bulls (Open Corrals)	10	x	7.5		=	75	
				19.3			193
<b>PE2 for PM<sub>10</sub> and NH<sub>3</sub> from the Cow Housing</b>				<b>lb/yr</b>		<b>23,848</b>	<b>283,693</b>
				<b>lb/day</b> = lb/yr÷ (365 day/yr)		<b>65.3</b>	<b>777.2</b>

Total Post Project Emissions from the Cow Housing Permit Unit (C-5203-8-0):

<b>Post-Project Potential to Emit (PE2) C-5203-8-0</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	65.3	23,848
CO	0	0
VOC	272.6	99,511
NH <sub>3</sub>	777.2	283,693

Liquid Manure Handling System (C-5203-9-1: Lagoon, Storage Pond, and Liquid Manure Land Application)

Lagoons/Storage Ponds:

### VOC

To satisfy BACT requirements, this dairy will be required to feed all animals at the dairy in accordance to NRC guidelines. The applicant has proposed to convert their existing lagoon into an anaerobic treatment lagoon. Therefore, the control efficiencies for feeding all animals in accordance with NRC guidelines and the anaerobic treatment lagoon will be used to calculate post-project VOC emissions from the lagoons/storage ponds.

The post-project VOC emissions from the lagoons/storage ponds are calculated in the table below:

<b>PE2 for VOC from Lagoons/Storage Ponds (Permit C-5203-9-1)</b>					
Type of Cow	# of Cows	Uncontrolled EF (lb-VOC/hd-yr)	Control(s)		Emissions (lb-VOC/yr)
Milk Cow (Freestall)	6,600	2.7	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>10,157</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Milk Cow (Loafing Barn)	200	2.3	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>262</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Dry Cow (Open Corral)	1,000	1.4	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>798</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Heifer (15-24 mo.) (corral/loafing)	2,200	1.0	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>1,254</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Heifer (7 - 14 mo.) (corral/loafing)	1,800	0.9	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>923</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Heifer (4 - 6 mo.) (Loafing)	700	0.8	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>319</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Calves (<3 mo.) (Above Hutches)	1,000	0.9	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>513</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Mature Bulls (Open Corral)	10	1.3	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>7</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
<b>PE2 for VOC from Lagoons/Storage Ponds</b>				<b>lb/yr</b>	<b>14,233</b>
				<b>lb/day</b> = lb/yr ÷ (365 day/yr)	<b>39.0</b>

### NH<sub>3</sub>

The post-project NH<sub>3</sub> emissions from the lagoons/storage ponds are calculated in the table below:

<b>PE2 for NH<sub>3</sub> from Lagoons/Storage Ponds (Permit C-5203-9-1)</b>					
<b>Type of Cow</b>	<b># of Cows</b>		<b>EF<sub>NH3</sub></b> <b>(lb/cow)</b>		<b>lb-NH<sub>3</sub>/yr</b>
Milk Cow (Freestall)	6,600	x	15.7	=	103,620
Milk Cow (Loafing)	200	x	15.5		3,100
Dry Cow (Loafing)	1,000	x	9.5	=	9,500
Heifer (15-24 mo.) (Corral/Loafing)	2,200	x	6.7	=	14,740
Heifer (7-14 mo.) (Corral/Loafing)	1,800	x	5.8	=	10,440
Heifer (4-6 mo.) (Loafing)	700	x	5.3	=	3,710
Calf (<3 mo.) (Above Hutches)	1,000	x	5.0	=	5,000
Mature Bulls (Open Corral)	10	x	8.9	=	89
<b>PE2 for NH<sub>3</sub> from Lagoons/Storage Ponds</b>			<b>lb/yr</b>		<b>150,199</b>
			<b>lb/day</b> = lb/yr ÷ (365 day/yr)		<b>412</b>

Liquid Manure Land Application:

VOC

To satisfy BACT requirements, this dairy will be required to feed all animals at the dairy in accordance with the NRC guidelines. The applicant has proposed to convert their existing lagoon into an anaerobic treatment lagoon. Therefore, the control efficiencies for feeding all animals in accordance with NRC guidelines and the anaerobic treatment lagoon will be used to calculate post-project VOC emissions from liquid manure land application.

The post-project VOC emissions from liquid manure land application are calculated in the table below:

<b>PE2 for VOC Land Application (Permit C-5203-9-1)</b>					
<b>Type of Cow</b>	<b># of Cows</b>	<b>Uncontrolled EF (lb-VOC/hd-yr)</b>	<b>Control(s)</b>		<b>Emissions (lb-VOC/yr)</b>
Milk Cow (Freestall)	6,600	5.0	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>18,810</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Milk Cow (Loafing Barn)	200	3.7	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>422</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Dry Cow (Open Corral)	1,000	2.3	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>1,311</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Heifer (15-24 mo.) (corral/loafing)	2,200	1.6	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>2,006</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Heifer (7 - 14 mo.) (corral/loafing)	1,800	1.4	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>1,436</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Heifer (4 - 6 mo.) (Loafing)	700	1.3	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>519</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Baby Calves (Under 3 mo.) (Hutches)	1,000	1.6	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>912</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
Mature Bulls (Open Corral)	10	2.1	Feeding to NRC guidelines (5%)	Anaerobic treatment lagoon (40%)	<b>12</b>
			x (1 - 0.05 )	x (1 - 0.40 ) =	
<b>PE2 for VOC from Land Application</b>				<b>lb/yr</b>	<b>25,428</b>
				<b>lb/day</b> = lb/yr ÷ (365 day/yr)	<b>69.7</b>

NH<sub>3</sub>

The post-project NH<sub>3</sub> emissions from land application are calculated in the table below:

<b>PE2 for NH<sub>3</sub> from Land Application (Permit C-5203-9-1)</b>					
<b>Type of Cow</b>	<b># of Cows</b>		<b>EF<sub>NH3</sub></b> <b>(lb/cow)</b>		<b>lb-NH<sub>3</sub>/yr</b>
Milk Cow (Freestall)	6,600	x	29.1	=	192,060
Milk Cow (Loafing)	200	x	24.9		4,980
Dry Cow (Loafing)	1,000	x	15.3	=	15,300
Heifer (15-24 mo.) (Corral/Loafing)	2,200	x	10.7	=	23,540
Heifer (7-14 mo.) (Corral/Loafing)	1,800	x	9.3	=	16,740
Heifer (4-6 mo.) (Loafing)	700	x	8.5	=	5,950
Calf (under 3 mo.) (Hutches)	1,000	x	9.3	=	9,300
Mature Bulls (Open Corral)	10	x	14.3	=	143
<b>PE2 for NH<sub>3</sub> from Land Application</b>			<b>lb/yr</b>		<b>268,013</b>
			<b>lb/day</b> = lb/yr ÷ (365 day/yr)		<b>734</b>

Total Post-Project Emissions from Liquid Manure Handling System (C-5203-9-1):

$$PE2_{VOC} = 14,233 \text{ lb-VOC/year} + 25,428 \text{ lb-VOC/year}$$

$$= \mathbf{39,661 \text{ lb-VOC/year}}$$

$$PE2_{VOC} = (39,661 \text{ lb-VOC/year}) \div (365 \text{ day/year})$$

$$= \mathbf{108.7 \text{ lb-VOC/day}}$$

$$PE2_{NH3} = 150,199 \text{ lb-NH}_3/\text{year} + 268,013 \text{ lb-NH}_3/\text{year}$$

$$= \mathbf{418,212 \text{ lb-NH}_3/\text{year}}$$

$$PE2_{NH3} = (291,383 \text{ lb-NH}_3/\text{year}) \div (365 \text{ day/year})$$

$$= \mathbf{798.3 \text{ lb-NH}_3/\text{day}}$$

<b>Post-Project Potential to Emit (PE2) C-5203-9-1</b>		
	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NO <sub>x</sub>	0	0
SO <sub>x</sub>	0	0
PM <sub>10</sub>	0	0
CO	0	0
VOC	108.7	39,661
NH <sub>3</sub>	798.3	291,383

Feed Storage and Handling Permit Unit (C-5203-11-1 and -12-0)

An emissions factor for feed has not yet been developed. Therefore, emissions from feed will not be quantified in this evaluation.

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

Pursuant to Section 4.9 of District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

<b>Pre-Project Stationary Source Potential to Emit [SSPE1] (lb/year)</b>						
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC	NH <sub>3</sub>
C-5203-1-0 (Milk Parlor)	0	0	0	0	2,614	3,775
C-5203-2-0 (Cow Housing)	0	0	37,606	0	53,490	137,769
C-5203-3-0 (Liquid manure handling Dairy 1)	0	0	0	0	25,391	170,151
C-5203-4-0 (Solid Manure Handling)	0	0	0	0	0	0
C-5203-5-0 (250 hp Diesel-fired Emergency Engine) <sup>6</sup>	551	52	28	168	63	-
C-5203-9-0 (Liquid Manure handling Dairy 2)	0	0	0	0	69,584	418,212
ATC C-5203-11-0 (Feed Storage and Handling)	0	0	0	0	0	0
<b>Pre-Project SSPE (SSPE1)</b>	<b>551</b>	<b>52</b>	<b>37,606</b>	<b>168</b>	<b>151,142</b>	<b>729,907</b>

<sup>6</sup> Emissions taken from project #1042116

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

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

<b>Post-Project Stationary Source Potential to Emit [SSPE2] (lb/year)</b>						
	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>CO</b>	<b>VOC</b>	<b>NH<sub>3</sub></b>
C-5203-1-2 (Milk Parlor)	0	0	0	0	1,852	3,380
C-5203-2-2 (Cow Housing)	0	0	24,054	0	40,464	128,369
C-5203-3-2 (Liquid manure handling)	0	0	0	0	22,168	156,512
C-5203-4-2 (Solid Manure Handling)	0	0	0	0	0	0
C-5203-5-0 (250 hp Diesel-fired Emergency Engine) <sup>7</sup>	551	52	28	168	63	-
C-5203-7-0 (Milk Parlor)	0	0	0	0	4,843	8,180
C-5203-8-0 (Cow Housing)	0	0	23,848	0	99,511	283,693
C-5203-9-1 (Liquid Manure handling)	0	0	0	0	39,661	418,212
C-5203-10-0 (Solid Manure Handling)	0	0	0	0	0	0
C-5203-11-1 (Feed Storage and Handling)	0	0	0	0	0	0
C-5203-12-0 (Feed Storage and Handling)	0	0	0	0	0	0
<b>Post-Project SSPE (SSPE2)</b>	<b>551</b>	<b>52</b>	<b>47,902</b>	<b>168</b>	<b>208,562</b>	<b>998,346</b>

<sup>7</sup> Emissions taken from project #1042116

## Estimated Particulate Toxic Air Contaminants

Total PM10: 1,000 lbs/yr  
10.000 lbs/hr

Enter the PM10 emissions.

Component	CAS Number	Percent of Total PM10	Annual Emissions (lbs/yr)	Hourly Emissions (lb/hr)
Aluminum	7429905	2.2887	22.887	0.22887000
Lead	7439921	0.0033	0.033	0.00033000
Manganese	7439965	0.0603	0.603	0.00603000
Mercury	7439976	0	-	-
Nickel	7440020	0.0026	0.026	0.00026000
Crystalline Silica	7631869	7.0553	70.553	0.70553000
Silver	7440224	0.0013	0.013	0.00013000
Antimony	7440360	0	-	-
Arsenic	7440382	0.0005	0.005	0.00005000
Barium	7440393	0.0465	0.465	0.00465000
Cadmium	7440439	0.0009	0.009	0.00009000
Hexavalent Chromium	18540299	0.0004	0.004	0.00004000
Cobalt	7440484	0.0003	0.003	0.00003000
Copper	7440508	0.0085	0.085	0.00085000
Vanadium	7440622	0.0114	0.114	0.00114000
Zinc	7440666	0.0235	0.235	0.00235000
Ammonia	7664417	0.4493	4.493	0.04493000
Bromine	7726956	0.0039	0.039	0.00039000
Selenium	7782492	0.0006	0.006	0.00006000
Chlorine	7782505	0.6411	6.411	0.06411000
Sulfates	9960	0.7932	7.932	0.07932000

**Note:** These emission factors are based on the Air Resources Board's Profile No. 423, Livestock Operations Dust. All Silicon is assumed to be Crystalline Silica. Since this assumption is extremely conservative, any decisions based on this assumption must be carefully considered. Five percent of the chromium is assumed to be hexavalent chromium.

## Estimated Toxic Air Contaminant Emissions for Lagoons at Dairies

(Does not include emissions from Miscellaneous Processes or enteric emissions from cows)

Total Number of Cows:

2,000

Enter the Total Number of Cows.

Component	CAS Number	Toxic Emissions Factors for Miscellaneous Processes (lb/Head/yr)	Annual Emissions (lbs/yr)	Hourly Emissions (lb/hr)
Xylenes	1210	0.011	22.00	0.00251
carbon tetrachloride	56235	0.020	40.00	0.00457
isopropyl alcohol	67630	-	-	-
Chloroform	67663	0.010	20.00	0.00228
Benzene	71432	0.010	20.00	0.00228
1,1,1-trichloroethane	71556	0.040	80.00	0.00913
bromomethane	74839	-	-	-
chloromethane	74873	-	-	-
chloroethane	75003	-	-	-
vinyl chloride	75014	-	-	-
methylene chloride	75092	-	-	-
Carbon disulfide	75150	-	-	-
tribromomethane	75252	0.444	888.00	0.10137
bromodichloromethane	75274	-	-	-
1,1-dichloroethane	75343	-	-	-
1,1-dichloroethene	75354	-	-	-
Trichloromonofluoromethane	75694	0.022	44.00	0.00502
1,1,2-trichloro-1,2,2-trifluoroethane	76131	0.020	40.00	0.00457
1,2-dichloropropane	78875	-	-	-
Methyl Ethyl Ketone (2-butanone)	78933	0.244	488.00	0.05571
1,1,2-trichloroethane	79005	-	-	-
Trichloroethylene	79016	0.010	20.00	0.00228
1,1,2,3,4,4-hexachloro-1,3-butadiene	87683	-	-	-
1,2-dichlorobenzene	95501	1.413	2,826.00	0.32260
1,2,4-trichlorobenzene	95636	0.010	20.00	0.00228
Ethylbenzene	100414	-	-	-
Styrene	100425	0.014	28.00	0.00320
1,4-Dichlorobenzene	106467	0.025	50.00	0.00571
1,2-dibromoethane	106934	-	-	-
1,3-Butadiene	106990	0.010	20.00	0.00228
1,2-dichloroethane	107062	-	-	-
vinyl acetate	108054	0.100	200.00	0.02283
Methyl Isobutyl Ketone	108101	0.057	114.00	0.01301
Toluene	108883	0.120	240.00	0.02740
Chlorobenzene	108907	-	-	-
n-hexane	110543	-	-	-
Cyclohexane	110827	0.010	20.00	0.00228
propylene	115071	0.130	260.00	0.02968
1,2,4-trimethylbenzene	120821	-	-	-
1,4-dioxane	123911	-	-	-
dibromochloromethane	124481	-	-	-
Tetrachloroethylene	127184	-	-	-
cis-1,2-dichloroethene	540590	-	-	-
1,3-dichlorobenzene	541731	0.025	50.00	0.00571

**Estimated Toxic Air Contaminant Emissions for Miscellaneous Processes at Dairie**  
(Does not include emissions from lagoons or enteric emissions from cows)

Total Number of Cows:

Enter the Total Number of Cows.

Component	CAS Number	Alternative Name	Toxic Emissions Factors for Miscellaneous Processes (lb/Head/yr)	Annual Emissions (lbs/yr)	Hourly Emissions (lb/hr)
Xylenes	1210		1.999E-02	-	-
Formaldehyde	50000		4.423E-03	-	-
Carbon tetrachloride	56235		6.523E-04	-	-
2-propanol	67630	Isopropyl Alcohol	1.799E-02	-	-
Chloroform	67663		1.453E-03	-	-
Benzene	71432		3.544E-03	-	-
Chloromethane	74873	Methyl Chloride	8.816E-03	-	-
Chloroethane	75003	Ethyl Chloride	2.659E-03	-	-
Acetaldehyde	75070		2.680E-02	-	-
Carbon disulfide*	75150		2.769E-02	-	-
Bromoform	75252		0.000E+00	-	-
Trichlorofluoromethane*	75694	Freon 11	1.196E-06	-	-
Tetraethyl lead	78002	Lead Compounds	0.000E+00	-	-
2-Butanone	78933	Methyl Ethyl Ketone	1.623E-01	-	-
1,1,2-Trichloroethane	79005		2.516E-03	-	-
Trichloroethene	79016	Trichloroethylene	0.000E+00	-	-
1,1,2,2-Tetrachloroethane	79345		9.710E-05	-	-
Methyl methacrylate	80626		0.000E+00	-	-
Hexachlorobutadiene	87683		0.000E+00	-	-
<b>Napthalene</b>	91203		1.293E-02	-	-
1,2-Dichlorobenzene	95501		6.095E-03	-	-
1,2,4-Trimethylbenzene	95636		0.000E+00	-	-
1,2-Dibromo-3-chloropropane	96128		5.489E-04	-	-
1,2,3-Trichloropropane	96184		3.073E-03	-	-
Isopropylbenzene	98828	Cumene	6.241E-04	-	-
Ethylbenzene	100414		3.859E-03	-	-
Styrene	100425		3.992E-03	-	-
Benzyl chloride	100447		3.210E-03	-	-
1,4-Dichlorobenzene	106467	p-Dichlorobenzene	5.769E-03	-	-
1,2-Dibromoethane	106934	Ethylene Dibromide (EDB)	3.404E-03	-	-
1,2-Dichloroethane	107062	Ethylene Dichloride (EDC)	6.555E-04	-	-
Acrylonitrile	107131		2.697E-03	-	-
Vinyl acetate	108054		2.188E-02	-	-
Methyl Isobutyl Ketone	108101	Hexone	7.883E-03	-	-
Toluene	108883		1.193E-02	-	-
Chlorobenzene	108907		3.025E-03	-	-
Hexane	110543		9.030E-03	-	-
Cyclohexane	110827		7.594E-02	-	-
1,2,4-Trichlorobenzene	120821		8.663E-03	-	-
Butyraldehyde	123728		1.265E-03	-	-
1,4 Dioxane	123911		1.567E-02	-	-
Tetrachloroethene*	127184	Perchloroethylene	7.236E-03	-	-
1,3-Dichlorobenzene	541731		5.450E-03	-	-
1,1,1,2-Tetrachloroethane	630206		0.000E+00	-	-
t-1,4-Dichloro-2-butene	764410		9.921E-03	-	-
Crotonaldehyde	4170303		1.572E-03	-	-

### Operational Emissions of Pollutants (Tons/Year) from Proposed Dairy Expansion

Source	VOC	NOx	PM10	PM2.5	NH3	CH4
Truck Trips (On Road Delivery Vehicles)	0.1	1.7	0.2	0.1	--	--
Employee and Visitor Travel	0.2	0.2	0.2	0.1	--	--
Mobile Dairy Equipment	0.03	0.4	0.02	0.02	--	0.003
Dairy Operational Emissions including Cattle in Corrals <sup>a</sup>	37.2	0.0	11.9	1.4	145.9	1,332.7
<b>Less Existing Dairy Mitigation Including Herd Reduction (Dairy Operational Emissions including Cattle in Corrals)<sup>b</sup></b>						
	-8.5	0.0	-6.8	-0.8	-11.7	-68.0
<b>Less Closed or Converted Dairies (Dairy Operational Emissions including Cattle in Corrals)<sup>c</sup></b>						
JMC Dairy	-4.9	--	-1.4	-0.2	-18.6	-205.3
Joe Machado Dairy	-6.5	--	-1.8	-0.2	-24.8	-272.9
Heifer Ranch Conversion	-2.9	--	0.7	0.1	-11.5	-154.6
<b>Less Emission Offsets<sup>d</sup></b>	-4.9	--	-3.5	--	--	--
Total Project Emissions	9.9	2.3	-0.4	0.4	79.3	631.9
SJVUAPCD Threshold	10	10	15	--	--	--

<sup>a</sup> This is the emissions increase at the expanded dairy. The following mitigation measures are included in the Expanded Dairy emissions: Mitigation Measures 2.6.3.1-1 (PM10 Control Measures - Expanded Dairy Facility) and 2.6.3.2-1 (VOC Control Measure - Expanded Dairy Facility).

<sup>b</sup> This is the emissions decrease at the existing dairy. Emission reductions are per Mitigation Measures 2.6.3.1-2 (PM10 Control Measures - Existing Dairy Facility) and 2.6.3.2-2 (VOC Control Measures - Existing Dairy Facility).

<sup>c</sup> Emission reductions are per Mitigation Measure 2.6.3.2-3 (Reduction in Milking Cows). Emissions include cattle housing, manure handling, and enteric emissions. Although not calculated, additional emission reductions would occur from the elimination of mobile dairy equipment and truck, employee, and visitor trips.

<sup>d</sup> Emission offsets are per Mitigation Measures 2.6.3.1-3 (PM10 Offset Purchase) and 2.6.3.2-4 (Purchase of Emission Reduction Credits).

Note: The proposed dairy expansion would not change the support crop acreage or crop types; therefore, the emissions change associated with agricultural activities would be zero.

### 3. Emission Factors for Diesel Powered Dairy Equipment

Emission Source	Diesel Offroad Equipment Emission Factor <sup>a</sup> (g/hp-hr)			
	VOC	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub> <sup>b</sup> CH <sub>4</sub>
Agricultural Tractor 121-175 hp	0.680	8.170	0.380	0.350 0.071

<sup>a</sup> Source: CARB. Offroad 2007, version 2.0.1.2. <http://www.arb.ca.gov/msei/offroad/offroad.htm>. VOC, NO<sub>x</sub>, and PM emission factors reflect model year 1996 equipment, which is the oldest model year in OFFROAD2007 that would still be operating in calendar year 2008 assuming an average equipment lifetime. The CH<sub>4</sub> emission factor was derived from OFFROAD2007 output for an average San Joaquin Valley equipment fleet mix in the year 2008.

<sup>b</sup> The PM<sub>2.5</sub> emission factor is scaled from the PM<sub>10</sub> factor according to the relative emission rate for diesel vehicle exhaust as reported in CARB, California Emission Inventory and Reporting System (CEIDARS), 2002.

### 4. Emissions Associated with Diesel Powered Dairy Equipment Expanded Dairy

Emission Source	Estimated Engine Size (hp)	Load Factor	Hours of Operation		Annual Emissions (ton/yr)			
			(equip-hr/week)	(equip-hr/yr)	VOC	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub> CH <sub>4</sub>
Dairy Tractor, Diesel	142	0.7	8	416	0.031	0.372	0.017	0.016 0.003

### Factors for Converting PM<sub>10</sub> to PM<sub>2.5</sub>

Emission Source	PM Profile Name	CARB Profile ID	PM <sub>10</sub> Fraction	PM <sub>2.5</sub> Fraction	PM <sub>2.5</sub> /PM <sub>10</sub> Factor
Land Preparation	Agricultural Tilling	417	0.45	0.10	0.22
Crop Harvesting	Agricultural Tilling	417	0.45	0.10	0.22
Windblown Dust - Farm	Windblown Dust-Agric. Lands	418	0.45	0.10	0.22
Cattle in Corrals	Livestock Operations Dust	423	0.48	0.06	0.11
Unpaved Road Dust	Unpaved Road Dust	470	0.59	0.13	0.21
Paved Road Dust	Paved Road Dust	471	0.46	0.08	0.17
Windblown Dust - Dairy	Dust - Unpaved Areas	416	0.59	0.13	0.21
Truck Exhausts	Diesel Vehicle Exhaust	425	1.00	0.92	0.92
Employee Travel	Gasoline Vehicles-Catalyst	400	0.97	0.90	0.93

Source: California Air Resources Board, "California Emission Inventory and Reporting System (CEIDARS). Particulate Matter (PM) Speciation Profiles. Summary of Overall Size Fractions and Reference Documentation." September 26, 2002.

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Urbemis 2007 Version 9.2.0

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\John\Projects\Bar 20 Dairy\Urbemis Feed Trucks.urb9

Project Name: Bar 20 Dairy - Expanded Dairy - Feed Trucks

Project Location: Fresno County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Dairy	0.06	1.03	0.32	0.00	0.09	0.04	117.56
TOTALS (tons/year, unmitigated)	0.06	1.03	0.32	0.00	0.09	0.04	117.56

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2008 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acres	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Dairy	16.00	1000 sq ft	1.00	16.00	160.00	160.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	0.0	2.3	97.5	0.2

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	0.0	5.6	87.9	6.5
Light Truck 3751-5750 lbs	0.0	1.8	97.7	0.5
Med Truck 5751-8500 lbs	0.0	1.7	98.3	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	76.2	23.8
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	0.0	7.1	14.3	78.6
Heavy-Heavy Truck 33,001-60,000 lbs	100.0	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	0.0	77.1	22.9	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	12.5	75.0	12.5

Travel Conditions

	Residential				Commercial	
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.0	10.0	10.0	10.0	10.0	10.0
Rural Trip Length (miles)	10.0	10.0	10.0	10.0	10.0	10.0
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Home-Work	Home-Shop	Home-Other	Commuter	Commercial Non-Work	Customer
Daily				0.0	0.0	100.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work urban trip length changed from 10.8 miles to 10 miles

Home-based work rural trip length changed from 16.8 miles to 10 miles

Home-based shop urban trip length changed from 7.3 miles to 10 miles

Home-based shop rural trip length changed from 7.1 miles to 10 miles

Home-based other urban trip length changed from 7.5 miles to 10 miles

Home-based other rural trip length changed from 7.9 miles to 10 miles

Commercial-based commute urban trip length changed from 9.5 miles to 10 miles

Commercial-based commute rural trip length changed from 14.7 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.35 miles to 10 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 10 miles

Commercial-based customer urban trip length changed from 7.35 miles to 10 miles

Commercial-based customer rural trip length changed from 6.6 miles to 10 miles

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Urbemis 2007 Version 9.2.0

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\John\Projects\Bar 20 Dairy\Urbemis Employees.urb9

Project Name: Bar 20 Dairy - Expanded Dairy - Employees and Visitors

Project Location: Fresno County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Dairy	0.16	0.17	2.10	0.00	0.24	0.05	123.36
TOTALS (tons/year, unmitigated)	0.16	0.17	2.10	0.00	0.24	0.05	123.36

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2008 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Dairy		92.00	1000 sq ft	1.00	92.00	763.60
					92.00	763.60

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.8	2.0	97.6	0.4

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	11.5	3.7	90.8	5.5
Light Truck 3751-5750 lbs	23.0	0.9	98.6	0.5
Med Truck 5751-8500 lbs	10.0	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	75.0	25.0
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	0.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	100.0
Motorcycle	3.7	77.1	22.9	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	10.0	80.0	10.0

Travel Conditions

	Residential				Commercial	
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	8.3	8.3	8.3	8.3	8.3	8.3
Rural Trip Length (miles)	8.3	8.3	8.3	8.3	8.3	8.3
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commuter	Non-Work	Customer
Dairy				0.0	0.0	100.0

Operational Changes to Defaults

- The urban/rural selection has been changed from Urban to Rural
- Home-based work urban trip length changed from 10.8 miles to 8.3 miles
- Home-based work rural trip length changed from 16.8 miles to 8.3 miles
- Home-based shop urban trip length changed from 7.3 miles to 8.3 miles
- Home-based shop rural trip length changed from 7.1 miles to 8.3 miles
- Home-based other urban trip length changed from 7.5 miles to 8.3 miles
- Home-based other rural trip length changed from 7.9 miles to 8.3 miles
- Commercial-based commute urban trip length changed from 9.5 miles to 8.3 miles
- Commercial-based commute rural trip length changed from 14.7 miles to 8.3 miles
- Commercial-based non-work urban trip length changed from 7.35 miles to 8.3 miles
- Commercial-based non-work rural trip length changed from 6.6 miles to 8.3 miles
- Commercial-based customer urban trip length changed from 7.35 miles to 8.3 miles
- Commercial-based customer rural trip length changed from 6.6 miles to 8.3 miles

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Urbemis 2007 Version 9.2.0

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\John\Projects\Bar 20 Dairy\Urbemis Milk Trucks.urb9

Project Name: Bar 20 Dairy - Expanded Dairy - Milk Trucks

Project Location: Fresno County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Dairy	0.04	0.68	0.21	0.00	0.06	0.03	77.15
TOTALS (tons/year, unmitigated)	0.04	0.68	0.21	0.00	0.06	0.03	77.15

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2008 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Dairy	14.00	14.00	1000 sq ft	1.00	14.00	105.00
					14.00	105.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	0.0	2.3	97.5	0.2

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	0.0	5.6	87.9	6.5
Light Truck 3751-5750 lbs	0.0	1.8	97.7	0.5
Med Truck 5751-8500 lbs	0.0	1.7	98.3	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	76.2	23.8
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	0.0	7.1	14.3	78.6
Heavy-Heavy Truck 33,001-60,000 lbs	100.0	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	0.0	77.1	22.9	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	12.5	75.0	12.5

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	7.5	7.5	7.5	7.5	7.5	7.5
Rural Trip Length (miles)	7.5	7.5	7.5	7.5	7.5	7.5
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commuter	Non-Work	Customer
Dairy				0.0	0.0	100.0

Operational Changes to Defaults

- The urban/rural selection has been changed from Urban to Rural
- Home-based work urban trip length changed from 10.8 miles to 7.5 miles
- Home-based work rural trip length changed from 16.8 miles to 7.5 miles
- Home-based shop urban trip length changed from 7.3 miles to 7.5 miles
- Home-based shop rural trip length changed from 7.1 miles to 7.5 miles
- Home-based other rural trip length changed from 7.9 miles to 7.5 miles
- Commercial-based commute urban trip length changed from 9.5 miles to 7.5 miles
- Commercial-based commute rural trip length changed from 14.7 miles to 7.5 miles
- Commercial-based non-work urban trip length changed from 7.35 miles to 7.5 miles
- Commercial-based non-work rural trip length changed from 6.6 miles to 7.5 miles
- Commercial-based customer urban trip length changed from 7.35 miles to 7.5 miles
- Commercial-based customer rural trip length changed from 6.6 miles to 7.5 miles

## Greenhouse Gas Emission Factors

Animal Type	Change in Animal Population					Uncontrolled Emission Factors <sup>1</sup>					
	Expanded Dairy	Existing Dairy	Machado Dairy	JMC Dairy	Bar 20 Dairy Location	CH4 (Manure) lbs-hd/yr	CH4 (Enteric) lbs-hd/yr	CO2 Equivalent multiplier for CH4	N20 (Manure) lbs-hd/yr	N20 (Enteric) lbs-hd/yr	CO2 Equivalent multiplier for N20
Milk Cows	6800	-304	-504	-670	-433	377.2	283.2	21	0.534	0	310
Dry Cows	1000	57			-53	377.2*	283.2*	21	0.534*	0	310
Heifers (15-24 mo)	2200	724			389	5.4	139.4	21	3.2	0	310
Heifers (7-14 mo)	1800	-753				5.4	88.7	21	3.2	0	310
Heifers (4-6 mo)	700	-21				5.4	88.7	21	3.2	0	310
Calves (under 3 mo)	1000	-306				5.4**	88.7**	21	3.2**	0	310
Bulls	10	9				6.2	116.8	21	0.0	0	310
<b>Total</b>	<b>13510</b>										

<sup>1</sup> GHG Emission Factors were obtained from ARB's document entitled "Draft Documentation of California's Greenhouse Gas Inventory" <http://www.arb.ca.gov/cc/cccif/inventory/inventory.php>

\*Dry Cow EF was assumed to be similar to milk cows

\*\*Calf EF was assumed to be similar to medium and small heifers

## Greenhouse Gas Emissions Calculations

### Methane (CH<sub>4</sub>)

#### Pre-Project Potential to Emit (PE1)

PE1 Emissions from Existing Dairy				
Type of Cow	# of Cows	EF (lbs-hd-yr)		tons-CH4/yr
Milking Cow	2904	660.4		958.9
Dry Cow	443	660.4		146.3
Heifer (15-24 mo)	276	144.8		20.0
Heifer (7-14 mo)	1553	94.1		73.1
Heifer (4-6 mo)	421	94.1		19.8
Calf (under 3 mo)	606	94.1		28.5
Bulls	1	144.8		0.1
<b>Total</b>	<b>6204</b>			<b>1246.6</b>

PE1 Emissions from Liquid Manure System for Expansion				
Type of Cow	# of Cows	Manure EF (lbs-hd-yr)	% of Manure*	tons-CH4/yr
Milking Cow	6800	377.2	80%	1026.0
Dry Cow	1000	377.2	80%	150.9
Heifer (15-24 mo)	2200	5.4	80%	4.8
Heifer (7-14 mo)	1800	5.4	80%	3.9
Heifer (4-6 mo)	700	5.4	80%	1.5
Calf (under 3 mo)	1000	5.4	80%	2.2
Bulls	10	6.2	80%	0.0
<b>Total</b>	<b>13510</b>			<b>1189.2</b>

\*Majority of the methane emissions will be generated from the liquid manure system. It will be assumed that 80% of the manure will be sent to the lagoon system and 20% of the manure will remain in the housing areas and stockpiled.

**Total Pre-Project Emissions = 2,435.8 tons-CH4/yr**  
**51152.3 tons-CO2/yr equivalents**

#### Post-Project Potential to Emit (PE2)

PE2 Enteric Emissions - Existing Dairy					
Type of Cow	# of Cows	Enteric (lbs/hd-yr)	Feed to NRC		tons-CH4/yr
Milking Cow	2600	283.2	5%		349.8
Dry Cow	500	283.2	5%		67.3
Heifer (15-24 mon)	1000	139.4	5%		66.2
Heifer (7-14 mon)	800	88.7	5%		33.7
Heifer (4-6 mon)	400	88.7	5%		16.9
Calf (under 3 mon)	300	88.7	5%		12.6
Feedlot Cattle/Bulls	10	116.8	5%		0.6
<b>Total</b>	<b>5610</b>				<b>547.0</b>

PE2 Manure Emissions Liquid Manure - Existing Dairy							
Type of Cow	# of Cows	Manure (lbs-hd-yr)	% of Manure	Feed to NRC			tons-CH4/yr
Milking Cow	2600	377.2	80%	5%			372.7
Dry Cow	500	377.2	80%	5%			71.7
Heifer (15-24 mon)	1000	5.4	80%	5%			2.1
Heifer (7-14 mon)	800	5.4	80%	5%			1.6
Heifer (4-6 mon)	400	5.4	80%	5%			0.8
Calf (under 3 mon)	300	5.4	80%	5%			0.6
Feedlot Cattle/Bulls	10	6.2	80%	5%			0.0
<b>Total</b>							<b>449.5</b>

PE2 Manure Emissions Solid Manure - Existing Dairy							
Type of Cow	# of Cows	Manure (lbs-hd-yr)	% of Manure	Feed to NRC	Frequent Scraping		tons-CH4/yr
Milking Cow	2600	377.2	20%	5%	7.1%		86.6
Dry Cow	500	377.2	20%	5%	7.1%		16.6
Heifer (15-24 mon)	1000	5.4	20%	5%	7.1%		0.5
Heifer (7-14 mon)	800	5.4	20%	5%	7.1%		0.4
Heifer (4-6 mon)	400	5.4	20%	5%	7.1%		0.2
Calf (under 3 mon)	300	5.4	20%	5%	7.1%		0.1
Feedlot Cattle/Bulls	10	6.2	20%	5%	7.1%		0.0
<b>Total</b>							<b>104.4</b>

PE2 Enteric for Emissions - Expansion Dairy							
Type of Cow	# of Cows	Enteric (lbs-hd-yr)	Feed to NRC				tons-CH4/yr
Milking Cow	6600	283.2	5%				887.8
Milking Cow - Saudi	200	283.2	5%				26.9
Dry Cow - Saudi	1000	283.2	5%				134.5
Heifer (15-24 mon)	2200	139.4	5%				145.7
Heifer (7-14 mon)	1800	88.7	5%				75.8
Heifer (4-6 mon)	700	88.7	5%				29.5
Calf (under 3 mon)	1000	88.7	5%				42.1
Feedlot Cattle/Bull	10	116.8	5%				0.6
<b>Total</b>							<b>1342.9</b>

PE2 Manure Emissions Liquid Manure - Expansion Dairy							
Type of Cow	# of Cows	Manure (lbs-hd-yr)	% of Manure	Feed to NRC			tons-CH4/yr
Milking Cow	6600	377.2	80%	5%			946.0
Milking Cow - Saudi	200	377.2	80%	5%			28.7
Dry Cow	1000	377.2	80%	5%			143.3
Heifer (15-24 mon)	2200	5.4	80%	5%			4.5
Heifer (7-14 mon)	1800	5.4	80%	5%			3.7
Heifer (4-6 mon)	700	5.4	80%	5%			1.4
Calf (under 3 mon)	1000	5.4	80%	5%			2.1
Feedlot Cattle/Bull	10	6.2	80%	5%			0.0
<b>Total</b>							<b>1129.7</b>

PE2 Manure Emissions Solid Manure - Expansion Dairy							
Type of Cow	# of Cows	Manure (lbs-hd-yr)	% of Manure	Feed to NRC	Frequent Scraping	Manure Incorporation	tons-CH4/yr
Milking Cow	6600	377.2	20%	5%	7.1%	29%	156.0
Milking Cow - Saudi	200	377.2	20%	5%	7.1%	29%	4.7
Dry Cow	1000	377.2	20%	5%	7.1%	29%	23.6
Heifer (15-24 mon)	2200	5.4	20%	5%	7.1%	29%	0.7
Heifer (7-14 mon)	1800	5.4	20%	5%	7.1%	29%	0.6
Heifer (4-6 mon)	700	5.4	20%	5%	7.1%	29%	0.2
Calf (under 3 mon)	1000	5.4	20%	5%	7.1%	29%	0.3
Feedlot Cattle/Bull	10	6.2	20%	5%	7.1%	29%	0.0
<b>Total</b>							<b>186.3</b>

**Total Post-Project Emissions = 3759.9 tons-CH4/yr  
78956.9 tons-CO2/yr equivalents**

**Increase in Emissions = Post-project - Pre-Project**  
**3759.9 - 2435.8 = 1324.0 tons-CH4/yr**  
**27804.6 tons-CO2/yr equivalents**

Emission Reductions from Shut Down of Existing Dairies				
	Milk	Dry	Heifers	Tons/yr
Bar 20 Dairy 1	433	53	11	161.3
allow heifers at above dairy			-400	(29.0)
Machado Dairy	504			166.4
JMC Dairy	670			221.2
<b>Total</b>	<b>1607</b>	<b>53</b>	<b>1660</b>	<b>520.0</b>

Increase in emissions after additional reductions =  
1324.0 - 520.0 = 804.1 tons-CH<sub>4</sub>/yr  
16885.2 tons-CO<sub>2</sub>/yr equivalents

### Nitrous Oxide (N<sub>2</sub>O)

#### Pre-Project Potential to Emit (PE1)

PE1 Emissions from Existing Dairy				
Type of Cow	# of Cows	EF (lbs-hd-yr)		tons-N <sub>2</sub> O/yr
Milking Cow	2904	0.534		0.8
Dry Cow	443	0.534		0.1
Heifer (15-24 mo)	276	3.2		0.4
Heifer (7-14 mo)	1553	3.2		2.5
Heifer (4-6 mo)	421	3.2		0.7
Calf (under 3 mo)	606	3.2		1.0
Bulls	1	0.0		0.0
<b>Total</b>	<b>6204</b>			<b>5.5</b>

PE1 Emissions from Liquid Manure System for Expansion				
Type of Cow	# of Cows	Manure EF (lbs-hd-yr)	% of Manure*	tons-N <sub>2</sub> O/yr
Milking Cow	6800	0.534	80%	1.5
Dry Cow	1000	0.534	80%	0.2
Heifer (15-24 mo)	2200	3.2	80%	2.8
Heifer (7-14 mo)	1800	3.2	80%	2.3
Heifer (4-6 mo)	700	3.2	80%	0.9
Calf (under 3 mo)	1000	3.2	80%	1.3
Bulls	10	0.0	80%	0.0
<b>Total</b>	<b>13510</b>			<b>9.0</b>

\*Majority of the methane emissions will be generated from the liquid manure system. It will be assumed that 80% of the manure will be sent to the lagoon system and 20% of the manure will remain in the housing areas and stockpiled.

Total Pre-Project Emissions = 14.4 tons-N<sub>2</sub>O/yr  
4471.9 tons-CO<sub>2</sub>/yr equivalents

#### Post-Project Potential to Emit (PE2)

PE2 Enteric Emissions - Existing Dairy				
Type of Cow	# of Cows	Enteric (lbs/hd-yr)		tons-N <sub>2</sub> O/yr
Milking Cow	2600	0		0.0
Dry Cow	500	0		0.0
Heifer (15-24 mon)	1000	0		0.0
Heifer (7-14 mon)	800	0		0.0
Heifer (4-6 mon)	400	0		0.0
Calf (under 3 mon)	300	0		0.0
Feedlot Cattle/Bulls	10	0		0.0
<b>Total</b>	<b>5610</b>			<b>0.0</b>

PE2 Manure Emissions Liquid Manure - Existing Dairy				
Type of Cow	# of Cows	Manure (lbs-hd-yr)	% of Manure	tons-N <sub>2</sub> O/yr
Milking Cow	2600	0.534	80%	0.6
Dry Cow	500	0.534	80%	0.1
Heifer (15-24 mon)	1000	3.2	80%	1.3
Heifer (7-14 mon)	800	3.2	80%	1.0
Heifer (4-6 mon)	400	3.2	80%	0.5
Calf (under 3 mon)	300	3.2	80%	0.4
Feedlot Cattle/Bulls	10	0.0	80%	0.0
<b>Total</b>				<b>3.9</b>

<b>PE2 Manure Emissions Solid Manure - Existing Dairy</b>						
Type of Cow	# of Cows	Manure (lbs-hd-yr)	% of Manure			tons-N2O/yr
Milking Cow	2600	0.534	20%			0.1
Dry Cow	500	0.534	20%			0.0
Heifer (15-24 mon)	1000	3.2	20%			0.3
Heifer (7-14 mon)	800	3.2	20%			0.3
Heifer (4-6 mon)	400	3.2	20%			0.1
Calf (under 3 mon)	300	3.2	20%			0.1
Feedlot Cattle/Bulls	10	0.0	20%			0.0
<b>Total</b>						<b>1.0</b>

<b>PE2 Enteric for Emissions - Expansion Dairy</b>						
Type of Cow	# of Cows	Enteric (lbs-hd-yr)				tons-N2O/yr
Milking Cow	6600	0				0.0
Milking Cow - Saudi	200	0				0.0
Dry Cow - Saudi	1000	0				0.0
Heifer (15-24 mon)	2200	0				0.0
Heifer (7-14 mon)	1800	0				0.0
Heifer (4-6 mon)	700	0				0.0
Calf (under 3 mon)	1000	0				0.0
Feedlot Cattle/Bull	10	0				0.0
<b>Total</b>						<b>0.0</b>

<b>PE2 Manure Emissions Liquid Manure - Expansion Dairy</b>						
Type of Cow	# of Cows	Manure (lbs-hd-yr)	% of Manure			tons-N2O/yr
Milking Cow	6600	0.534	80%			1.4
Milking Cow - Saudi	200	0.534	80%			0.0
Dry Cow	1000	0.534	80%			0.2
Heifer (15-24 mon)	2200	3.2	80%			2.8
Heifer (7-14 mon)	1800	3.2	80%			2.3
Heifer (4-6 mon)	700	3.2	80%			0.9
Calf (under 3 mon)	1000	3.2	80%			1.3
Feedlot Cattle/Bull	10	0.0	80%			0.0
<b>Total</b>						<b>9.0</b>

<b>PE2 Manure Emissions Solid Manure - Expansion Dairy</b>						
Type of Cow	# of Cows	Manure (lbs-hd-yr)	% of Manure			tons-N2O/yr
Milking Cow	6600	0.534	20%			0.4
Milking Cow - Saudi	200	0.534	20%			0.0
Dry Cow	1000	0.534	20%			0.1
Heifer (15-24 mon)	2200	3.2	20%			0.7
Heifer (7-14 mon)	1800	3.2	20%			0.6
Heifer (4-6 mon)	700	3.2	20%			0.2
Calf (under 3 mon)	1000	3.2	20%			0.3
Feedlot Cattle/Bull	10	0.0	20%			0.0
<b>Total</b>						<b>2.2</b>

**Total Post-Project Emissions = 16.0 tons-N2O/yr  
4969.4 tons-CO2/yr equivalents**

**Increase in Emissions = Post-project - Pre-Project**  
**16.0 - 14.4 = 1.6 tons-N2O/yr**  
**497.5 tons-CO2/yr equivalents**

<b>Emissions Reductions/Increase from Shut Down and Modification of Existing Dairies</b>				
	Milk	Dry	Heifers	Tons/yr
Bar 20 Dairy 1	433	53	11	0.1
allow heifers at above dairy			-400	(0.6)
Machado Dairy	504			0.1
JMC Dairy	670			0.2
<b>Total</b>	<b>1607</b>	<b>53</b>	<b>1660</b>	<b>(0.2)</b>

**Increase in emissions after additional reductions =**  
**1.6 - (0.2) = 1.8 tons-N2O/yr**  
**553.1 tons-CO2/yr equivalents**

## **Appendix B**

### **Health Risk Assessment and Ambient Air Quality Analysis**



## San Joaquin Valley Unified Air Pollution Control District

**Date:** August 9, 2007

**To:** Sheraz Gill, Senior Air Quality Engineer

**From:** Glenn Reed, Senior Air Quality Specialist

**Subject:** Health Risk Assessment and Ambient Air Quality Analysis of Emissions from the Proposed Expansion of the Bar 20 Dairy to Meet the Requirements of the California Environmental Quality Act

The Bar 20 Dairy is proposing to expand its operation by adding 6,800 milk cows, 1,000 dry cows, 2,200 large heifers (15-24 months), 1,800 medium heifers (7-14 months), 700 small heifers (4-6 months), 1,000 calves (under 3 months) to the dairy, and 10 bulls. The Dairy has applied for permits for this expansion. San Joaquin Valley Unified Air Pollution Control District regulations require that an ambient air quality analysis be performed for all sources that are subject to a public notice requirement during the permitting process to determine if the emissions from the proposed sources will cause or contribute significantly to a violation of the State or National Ambient Air Quality Standards. The only pollutant for which an analysis is required for the proposed expansion is particulate matter with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>). The PM<sub>10</sub> air quality impacts from the emissions from this expansion were determined on July 17, 2007. The estimated maximum 24-hour concentration of PM<sub>10</sub> was 9.57 micrograms per cubic meter. Because this predicted concentration is less than the District's draft interim significance threshold of 10.4 micrograms per cubic meter 24-hour PM<sub>10</sub> concentration, there will be no significant contribution to violation of the State's ambient air quality standard for PM<sub>10</sub>. The District also has a risk management review policy that requires an assessment of risk from toxic air contaminants emitted by every proposed modified or new source. The risk resulting from the emissions of toxic air contaminants from the proposed sources was assessed on May 16, 2007 and determined not to be significant in accordance with the District's risk management policy.

Although these analyses were adequate for District permitting, they did not address the risks and ambient air quality impacts from all the sources that must be considered to comply with the requirements of the California Environmental Quality Act (CEQA). To comply with CEQA, all sources including mobile sources that are attributed to the project must be included in the analysis. In accordance with District CEQA guidance these additional sources would include the emissions from milk trucks traveling to and from the milk barn from Whitesbridge Road, feed trucks traveling to and from the feed storage area from Whitesbridge Road, and trucks hauling manure for land application

from the solids handling area to the fields; emissions during idling of milk trucks at the milk barn, feed trucks at the feed storage area, and manure hauling trucks at the solids handling area; and emissions from the tractor used to scrape manure from the corrals.

## **Emissions**

For this analysis, emissions of PM10 and toxic air contaminants were estimated for both permitted and non-permitted sources. The emissions for toxic air contaminants from permitted sources differ from those used in the analyses for permitting because emissions estimates for PM10 have changed because of proposed controls. Thus, it was necessary to perform a new analysis for all permitted sources as well as the mobile sources that were not included in the previous permitting risk assessment. The estimates for emissions of PM10 and toxic air contaminants are discussed below.

### **PM10 Emissions**

Emissions of PM10 from sources in the proposed expansion were estimated using the District's PM10 emission factors. Emissions reductions were estimated based on the Dairy's proposed mitigation measures and the associated control efficiencies. The total PM10 emissions from the cow housing at the proposed expansion will be 11.13 tons per year. The Dairy has also proposed to reduce PM10 emissions from the existing dairy operations by 6.83 tons per year.

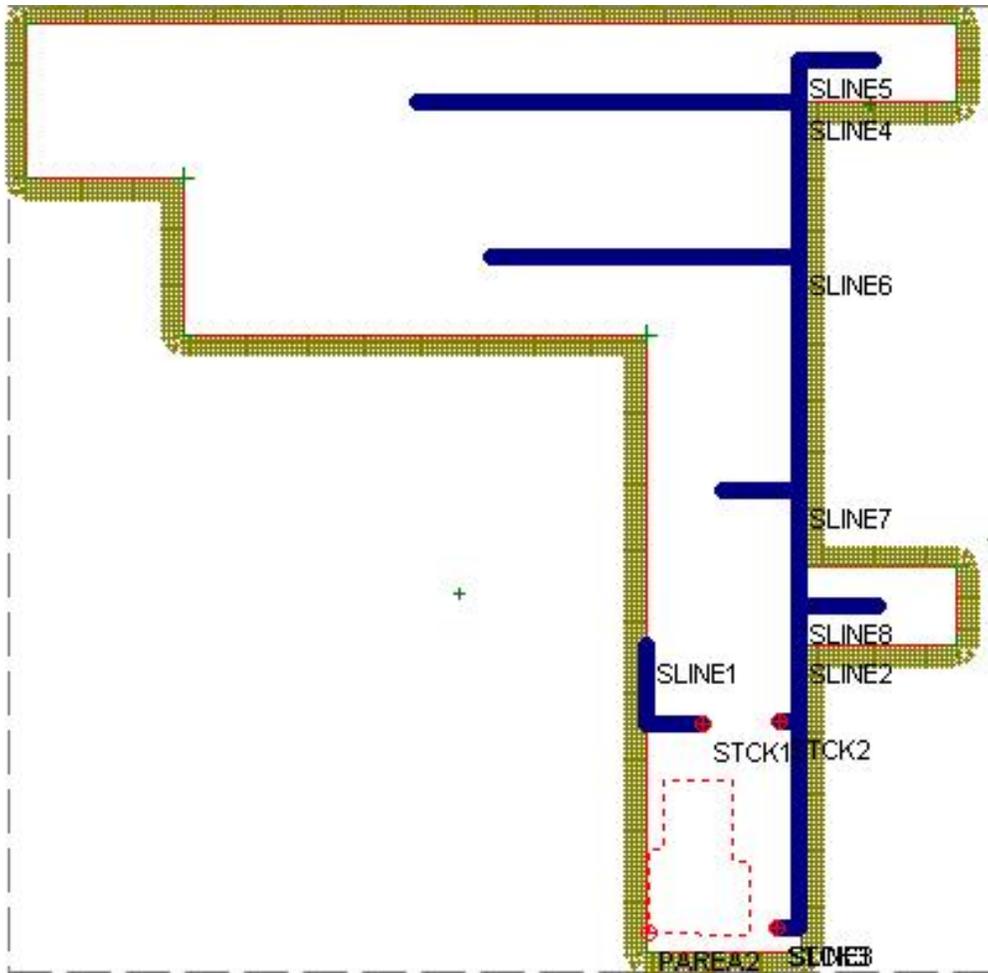
Exhaust emissions from mobile sources that must be considered include those from the following sources:

1. Trucks hauling milk, feed, and manure for land application traveling within the boundaries of the facility.
2. Idling of trucks hauling milk, feed, and manure.
3. Tractors used to scrape manure in the corrals.

The methodology for estimating emissions from these sources and the estimates are described below.

**Truck Travel Emissions.** The latest version of the California Air Resources Board's (ARB's) Emission Factor model (EMFAC2007) was used to estimate exhaust emissions from truck travel. It was assumed that all trucks hauling milk or feed would be heavy heavy-duty (HHD) diesel trucks. All trucks hauling manure were assumed to be medium heavy duty (MHD) diesel trucks. EMFAC2007 was run to estimate emission factors for HHD and MHD diesel trucks for Fresno County for 2008. It was assumed that travel speed within the facility would be 15 miles per hour. Travel routes were identified for all three types of truck. Milk and feed trucks were assumed to travel from Whitesbridge Road to and from the milk barn and the feed storage area. A single main travel route for manure hauling trucks from the solids handling area to the northernmost field was identified. Other travel routes branching from this main route to the center of other fields were also identified. The travel routes are shown in Figure 1. Estimated numbers of trucks were 7 milk trucks per day, 8 feed trucks per day, and 2000 manure hauling truck trips per year. All emissions estimates for truck travel emissions are shown in Table 1.

Figure 1. Travel Routes, Truck Idling Locations, and Manure Scraping Area



**Note:** SLINE1 is the milk truck travel route. SLINE2 is the feed truck travel route. SLINE3, SLINE4, SLINE5, SLINE6, SLINE7, and SLINE9 are manure hauling truck travel routes. STCK1 is the point where milk trucks idling. STCK2 and STCK3 are the points where feed trucks and manure hauling trucks idle. PAREA2 is the corral area where manure scraping occurs. The green and gold crosses are receptors. The boundary of the facility is outlined with a red line.

**Table 1. Truck Travel Emission Estimates**

Type of Vehicles	Route	Start		End		Distance (mi)	Emission Factor (g/mi)	Trucks/Week	Emissions (g/sec)	Emissions (lb/yr)
		X-Coordinate	Y-Coordinate	X-Coordinate	Y-Coordinate					
Milk Trucks	A	7.79	1614.42	7.79	1202.2	0.26				
	B	7.79	1202.2	300.2	1202.2	0.18				
					Total	0.44	1.328	49	9.40E-05	6.53
Feed Trucks	A	805.55	1614.08	805.55	1213.96	0.25				
	B	805.55	1213.96	703.07	1213.96	0.06				
					Total	0.31	1.328	56	7.66E-05	5.32
Manure Hauling Trucks	1A	698.61	128.56	805.55	128.56	0.07				
	1B	805.55	128.56	805.55	4693.85	2.84				
					Total	2.90	0.544	38.5	2.00E-04	13.91
Manure Hauling Trucks	2	805.55	4472.61	-1200	4472.63	1.25		7.7	1.72E-05	1.19
	3	805.55	4693.85	1200	4693.85	0.25		7.7	3.38E-06	0.23
	4	805.55	3660	-815	3660	1.01		7.7	1.39E-05	0.97
	5	805.55	2430	400	2430	0.25		7.7	3.48E-06	0.24
	6	805.55	1815	1218	1815	0.26		7.7	3.54E-06	0.25

Note: Diesel exhaust emission factors were taken from an EMFAC2007 model run for 2008 for Fresno County. It was assumed that Milk and Feed Trucks would be heavy heavy duty diesel vehicles and that Manure Hauling Trucks would be medium heavy duty diesel vehicles.

**Truck Idling Emissions.** It was assumed that all trucks would idle for 5 minutes a day. Idling locations at the milk barn, feed storage area, and solids handling area were identified. Emission factors from EMFAC2007 (i.e., those for a travel speed of 0 miles per hour) were used. Emissions estimates are shown in Table 2.

**Manure Scraping Emissions.** Data from ARB's Off-Road Emissions model (OFFROAD2007) were used to estimate exhaust emissions from the tractor used to scrape manure in the corrals. It was assumed that the tractor would have a horsepower rating of 142 hp which is the average horsepower rating of California tractors in the range from 120 to 175 hp. A 70 percent load factor was used. The emission factor used was 0.38 g/bhp-hr which is the worst-case emission factor because this is the emission factor for the oldest tractor in the fleet that might be operating in 2008. Based on information provided by the applicant as to the procedure to be used for scraping manure from the corrals, it was assumed that the tractor would operate for 8 hours per week. Emissions calculations are provided in Table 3.

### **Toxic Air Contaminant Emissions**

Previously, the District developed toxic air contaminant emission factors for lagoons and miscellaneous processes based on data from a number of studies that were used to define the volatile organic compound emission factor for dairies. These emission factors are based on the total number of cows at the dairy. They are used in all risk management reviews for dairies. A copy of these emission factors is given in the Appendix. PM10 emitted from the corrals contain toxic air contaminants. To estimate these emissions of toxic air contaminants, a profile from ARB was used. This profile is also included in the Appendix. Table 4 summarizes all toxic air contaminant emissions from the sources at the dairy that will be permitted. All PM10 emissions calculated for diesel exhaust from mobile sources discussed above are toxic.

### **Modeling Methodology**

The U.S. Environmental Protection Agency's (EPA's) approved model (i.e., the American Meteorological Society/Environmental Protection Agency Regulatory Model or AERMOD) was used to predict ambient concentrations of pollutants from emission estimates. AERMOD was developed by a joint committee of the American Meteorological Society (AMS) and EPA as a replacement for EPA's previously approved model, the Industrial Source Complex – Short-Term model or ISCST3. AERMOD implements a more sophisticated method for characterizing dispersion within the planetary boundary layer than ISCST3 does. AERMOD is the only approved model for predicting ambient concentrations from emissions from these types of sources since December 6, 2006.

In addition to the emission estimates discussed above, the following are major inputs used in this analysis:

**Table 2. Truck Idling Emissions**

Type of Vehicles	Emission Factor (g/sec)	Minutes Idling/Truck	Trucks/Week	Emissions (g/sec)	Emissions (lb/yr)
Milk Trucks	1.804	5	49	1.21E-05	0.84
Feed Trucks	1.804	5	56	1.39E-05	0.96
Manure Hauling Trucks	0.988	5	38.5	5.23E-06	0.36
Total					2.17

**Table 3. Manure Scraping Tractor Emissions**

	HP	Load	Hours/Week	Weeks/Year	Emission Factor (g/hp-hr)	Emissions (g/sec)	Emissions (lb/yr)
Manure Scraping Tractor	142	0.7	8	52	0.38	4.98E-04	34.61

1. All truck travel emissions were modeled as a line sources (i.e., a series of line sources). It was assumed that each of the volume sources for milk or feed truck travel would have a width of 12 ft, a vertical dimension of 6 ft, and a release height of 6 ft. Volume sources for manure hauling truck travel have a width of 12 ft, a vertical dimension of 0.6 m and a release height of 0.6 m.
2. The idling emissions from milk and feed trucks were modeled as point sources with a stack height of 12.6 ft, gas exit temperature of 366K, stack inside diameter of 0.1 m, and gas exit velocity of 51.71 m/s. Manure handling truck idling emissions were modeled as point sources with a stack height of 0.6 ft, gas exit temperature of 366K, stack inside diameter of 0.1 m, and gas exit velocity of 0.001 m/s.
3. Exhaust emissions from the manure-scraping tractor were modeled as a polygonal area source with the dimensions of the corral area and a release height of 10 ft.
4. Emissions from miscellaneous sources were modeled as a polygonal area source with the dimensions of the entire cow housing and a release height of 1 m.
5. Rectangular area sources with the dimensions of each lagoon were used to model emissions from the two lagoons. The release height modeled was 0 m.
6. A full year of meteorological data collected in 2004 at the Fresno-Yosemite International Airport in Fresno, CA were modeled. The corresponding upper air data from the Oakland, CA airport were also modeled.
7. The regulatory default options and rural dispersion coefficients were used.
8. Annual and 24-hour average concentrations of diesel particulate matter (DPM) were modeled. The averaging times modeled for other toxic air contaminants were 1-hour, 4-hour, 6-hour, monthly, and annual.

All inputs were in accordance with the District's *Guidance for Dispersion Modeling* (August 2006, Revision 1.2).

### **Risk Assessment Methodology**

The ARB's Hot Spots Analysis and Reporting Program (HARP), Version 1.3, Build 23.04.05, October 2006, was used to determine risk from emissions non-DPM toxic air contaminants. The following options in HARP were used:

1. Inhalation, soil ingestion, dermal absorption, vegetable intake, and mother's milk pathways were used.
2. A 70-year lifetime residential cancer risk was calculated using the Derived (OEHHA) Method.
3. A deposition rate of 0.2 m/s was used.
4. The percentage of vegetables that are home-grown was assumed to be 15 percent for each category.

Cancer, chronic non-carcinogenic, and acute risks were calculated.

DPM is primarily a carcinogen. To estimate the cancer risk from DPM emissions, a factor of 4.1453E-04 was used. This factor is based upon a cancer slope factor of 1.1, a 70-year lifetime, a 350 day/yr exposure frequency, and a daily breathing rate of 393 l. Predicted annual average DPM concentrations were multiplied by this factor to estimate cancer risk. DPM cancer risks were added to those predicted by HARP for other toxic air contaminants to determine total cancer risks at each receptor.

## **Results**

The following are the results of the analyses:

1. The maximum 24-hour PM10 concentration predicted is 9.58 micrograms per cubic meter.
2. The maximum cancer risk predicted at a residential receptor is 0.58 in a million.
3. The maximum chronic non-carcinogenic hazard index (HI) predicted at a residential receptor is 0.0233.
4. The maximum acute HI predicted at any receptor is 0.51. The receptor at which this risk was predicted is a worker receptor.

No cancer or chronic non-carcinogenic risks for worker receptors were estimated because all the worker sites surrounding the dairy expansion are agricultural fields. Although it is reasonable to believe that workers in those fields might be subjected to acute risks, it is not probable that any workers would be spending a significant amount of time during a year at a single location such that they would have cancer or chronic risks.

## **Conclusions**

The following conclusions can be drawn from these analyses:

1. There will be no significant contributions to a violation of the State Ambient Air Standards for PM10 because the maximum predicted 24-hour PM10 concentration is less than the District's draft interim significance threshold.
2. Cancer, chronic non-carcinogenic, and acute risks from emissions of toxic air contaminants at the proposed dairy expansion will not be significant. The maximum impacts are below the District's significance levels for CEQA (i.e., a cancer risk less than 10 in a million and chronic non-carcinogenic and acute HIs less than 1).

## **Appendix**

### **Emission Factors for Toxic Air Contaminants from Miscellaneous Processes, Lagoons, and Cow Housing at Dairies**

**Estimated Toxic Air Contaminant Emissions for Miscellaneous Processes at Dairies**  
 (Does not include emissions from lagoons or enteric emissions from cows)

Total Number of Cows:

Enter the Total Number of Cows.

Component	CAS Number	Alternative Name	Toxic Emissions Factors for Miscellaneous Processes (lb/Head/yr)	Annual Emissions (lbs/yr)	Hourly Emissions (lb/hr)
Xylenes	1210		1.999E-02	-	-
Formaldehyde	50000		4.423E-03	-	-
Carbon tetrachloride	56235		6.523E-04	-	-
2-propanol	67630	Isopropyl Alcohol	1.799E-02	-	-
Chloroform	67663		1.453E-03	-	-
Benzene	71432		3.544E-03	-	-
Chloromethane	74873	Methyl Chloride	8.816E-03	-	-
Chloroethane	75003	Ethyl Chloride	2.659E-03	-	-
Acetaldehyde	75070		2.680E-02	-	-
Carbon disulfide*	75150		2.769E-02	-	-
Bromoform	75252		0.000E+00	-	-
Trichlorofluoromethane*	75694	Freon 11	1.196E-06	-	-
Tetraethyl lead	78002	Lead Compounds	0.000E+00	-	-
2-Butanone	78933	Methyl Ethyl Ketone	1.623E-01	-	-
1,1,2-Trichloroethane	79005		2.516E-03	-	-
Trichloroethene	79016	Trichloroethylene	0.000E+00	-	-
1,1,2,2-Tetrachloroethane	79345		9.710E-05	-	-
Methyl methacrylate	80626		0.000E+00	-	-
Hexachlorobutadiene	87683		0.000E+00	-	-
<b>Napthalene</b>	91203		1.293E-02	-	-
1,2-Dichlorobenzene	95501		6.095E-03	-	-
1,2,4-Trimethylbenzene	95636		0.000E+00	-	-
1,2-Dibromo-3-chloropropane	96128		5.489E-04	-	-
1,2,3-Trichloropropane	96184		3.073E-03	-	-
Isopropylbenzene	98828	Cumene	6.241E-04	-	-
Ethylbenzene	100414		3.859E-03	-	-
Styrene	100425		3.992E-03	-	-
Benzyl chloride	100447		3.210E-03	-	-
1,4-Dichlorobenzene	106467	p-Dichlorobenzene	5.769E-03	-	-
1,2-Dibromoethane	106934	Ethylene Dibromide (EDB)	3.404E-03	-	-
1,2-Dichloroethane	107062	Ethylene Dichloride (EDC)	6.555E-04	-	-
Acrylonitrile	107131		2.697E-03	-	-
Vinyl acetate	108054		2.188E-02	-	-
Methyl Isobutyl Ketone	108101	Hexone	7.883E-03	-	-
Toluene	108883		1.193E-02	-	-
Chlorobenzene	108907		3.025E-03	-	-
Hexane	110543		9.030E-03	-	-
Cyclohexane	110827		7.594E-02	-	-
1,2,4-Trichlorobenzene	120821		8.663E-03	-	-
Butyraldehyde	123728		1.265E-03	-	-
1,4 Dioxane	123911		1.567E-02	-	-
Tetrachloroethene*	127184	Perchloroethylene	7.236E-03	-	-
1,3-Dichlorobenzene	541731		5.450E-03	-	-
1,1,1,2-Tetrachloroethane	630206		0.000E+00	-	-
t-1,4-Dichloro-2-butene	764410		9.921E-03	-	-
Crotonaldehyde	4170303		1.572E-03	-	-

## Estimated Particulate Toxic Air Contaminants

Total PM10: 1,000 lbs/yr  
10,000 lbs/hr

Enter the PM10 emissions.

Component	CAS Number	Percent of Total PM10	Annual Emissions (lbs/yr)	Hourly Emissions (lb/hr)
Aluminum	7429905	2.2887	22.887	0.22887000
Lead	7439921	0.0033	0.033	0.00033000
Manganese	7439965	0.0603	0.603	0.00603000
Mercury	7439976	0	-	-
Nickel	7440020	0.0026	0.026	0.00026000
Crystalline Silica	7631869	7.0553	70.553	0.70553000
Silver	7440224	0.0013	0.013	0.00013000
Antimony	7440360	0	-	-
Arsenic	7440382	0.0005	0.005	0.00005000
Barium	7440393	0.0465	0.465	0.00465000
Cadmium	7440439	0.0009	0.009	0.00009000
Hexavalent Chromium	18540299	0.0004	0.004	0.00004000
Cobalt	7440484	0.0003	0.003	0.00003000
Copper	7440508	0.0085	0.085	0.00085000
Vanadium	7440622	0.0114	0.114	0.00114000
Zinc	7440666	0.0235	0.235	0.00235000
Ammonia	7664417	0.4493	4.493	0.04493000
Bromine	7726956	0.0039	0.039	0.00039000
Selenium	7782492	0.0006	0.006	0.00006000
Chlorine	7782505	0.6411	6.411	0.06411000
Sulfates	9960	0.7932	7.932	0.07932000

**Note:** These emission factors are based on the Air Resources Board's Profile No. 423, Livestock Operations Dust. All Silicon is assumed to be Crystalline Silica. Since this assumption is extremely conservative, any decisions based on this assumption must be carefully considered. Five percent of the chromium is assumed to be hexavalent chromium.

**Estimated Toxic Air Contaminant Emissions for Lagoons at Dairies**  
(Does not include emissions from Miscellaneous Processes or enteric emissions from cows)

Total Number of Cows: **2,000**

Enter the Total Number of Cows.

Component	CAS Number	Toxic Emissions Factors for Miscellaneous Processes (lb/Head/yr)	Annual Emissions (lbs/yr)	Hourly Emissions (lb/hr)
Xylenes	1210	0.011	22.00	0.00251
carbon tetrachloride	56235	0.020	40.00	0.00457
isopropyl alcohol	67630	-	-	-
Chloroform	67663	0.010	20.00	0.00228
Benzene	71432	0.010	20.00	0.00228
1,1,1-trichloroethane	71556	0.040	80.00	0.00913
bromomethane	74839	-	-	-
chloromethane	74873	-	-	-
chloroethane	75003	-	-	-
vinyl chloride	75014	-	-	-
methylene chloride	75092	-	-	-
Carbon disulfide	75150	-	-	-
tribromomethane	75252	0.444	888.00	0.10137
bromodichloromethane	75274	-	-	-
1,1-dichloroethane	75343	-	-	-
1,1-dichloroethene	75354	-	-	-
Trichloromonofluoromethane	75694	0.022	44.00	0.00502
1,1,2-trichloro-1,2,2-trifluoroethane	76131	0.020	40.00	0.00457
1,2-dichloropropane	78875	-	-	-
Methyl Ethyl Ketone (2-butanone)	78933	0.244	488.00	0.05571
1,1,2-trichloroethane	79005	-	-	-
Trichloroethylene	79016	0.010	20.00	0.00228
1,1,2,3,4,4-hexachloro-1,3-butadiene	87683	-	-	-
1,2-dichlorobenzene	95501	1.413	2,826.00	0.32260
1,2,4-trichlorobenzene	95636	0.010	20.00	0.00228
Ethylbenzene	100414	-	-	-
Styrene	100425	0.014	28.00	0.00320
1,4-Dichlorobenzene	106467	0.025	50.00	0.00571
1,2-dibromoethane	106934	-	-	-
1,3-Butadiene	106990	0.010	20.00	0.00228
1,2-dichloroethane	107062	-	-	-
vinyl acetate	108054	0.100	200.00	0.02283
Methyl Isobutyl Ketone	108101	0.057	114.00	0.01301
Toluene	108883	0.120	240.00	0.02740
Chlorobenzene	108907	-	-	-
n-hexane	110543	-	-	-
Cyclohexane	110827	0.010	20.00	0.00228
propylene	115071	0.130	260.00	0.02968
1,2,4-trimethylbenzene	120821	-	-	-
1,4-dioxane	123911	-	-	-
dibromochloromethane	124481	-	-	-
Tetrachloroethylene	127184	-	-	-
cis-1,2-dichloroethene	540590	-	-	-
1,3-dichlorobenzene	541731	0.025	50.00	0.00571

## **Appendix C**

**Report of Discharge  
Larry A. Shehadey Dairy  
(Bar 20 Dairy)**

**Appendix C**

**Report of Discharge  
Larry A. Shehadey Dairy  
(Bar 20 Dairy)**





**Livingston Dairy Consulting, Inc.**

99 North Tower Square

Tulare, California 93274

(559) 687-1440

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Report of  
**WASTE DISCHARGE**

*Prepared for:*

**LARRY A. SHEHADEY DAIRY**

**24387 WEST WHITESBRIDGE ROAD**

**KERMAN, CA 93630**

*Fresno County*

February, 2004



*Larry A. Shehadey Dairy*  
*A New Facility*

A. Summary

- Larry A. Shehadey Dairy consists of 2,256 acres owned by Larry A. Shehadey in western Fresno County, California.
- The predominant soils for the dairy facility area have clay content that varies from 5 to 35% with moderate permeability.
- The historic average groundwater level near the site is between 40 and 75 feet below ground surface by the Department of Water Resources.
- The dairy facility is planned to consist of 325 acres of operations area with freestall barns, corrals, dairy barn, feed storage area, manure management area, process water storage, and 1,847 acres of irrigated crop land.
- The facility will house a milking herd of 6,000 and 7,680 head of support stock.
- The entire dairy site is designed to drain all manure storage, feed storage and corrals to the liquid retention system.
- Storage volume needed to contain 120 days of dairy process water, 120 days of rainfall runoff, and runoff from a 25 year-24 hour storm event is estimated at 9,367,510 cubic feet. Planned storage capacity, allowing for 2 feet of freeboard, is 9,745,527.
- Dairy lagoon water storage is to be constructed of soils with a clay content of 10% or greater. The lagoon inverts are separated by at least five feet from the highest anticipated groundwater.
- Annual nitrogen demand of the planned crop rotation is 473 pounds per acre. Estimated nitrogen in the stored process water contains 487,263 pounds of Nitrogen per year (264 pounds per acre). Stored dairy process water can supply 56% of the crop requirement.
- Until monitoring determines adjustment may be needed, at least 14,631 tons of dry manure will be transported off-site for use as a fertilizer/soil amendment.



**One – Description**



*Larry A. Shehadey Dairy*  
*A New Facility*

**B. Description**

Larry Shehadey Dairy is located 12 miles west of the city of Kerman on Whitesbridge Road. The property consists of 2,256.07 owned contiguous acres in western Fresno County, including portions of Sections 31, 32, and 33, T13S, R16E, and portions of Sections 4 and 9 of T14S, R16E. Assessors Parcel Numbers are included below

<u>ASSESSOR'S PARCEL NUMBER</u>	<u>ACREAGE</u>
<i>Fresno County</i>	
15 - 06 - 12	160.00
15 - 06 - 14	240.00
15 - 06 - 44	240.00
15 - 06 - 46	160.00
15 - 06 - 52	119.48
15 - 06 - 53	367.75
15 - 06 - 54	80.00
15 - 06 - 55	160.00
15 - 10 - 08	326.00
15 - 10 - 19	78.00
15 - 10 - 21	<u>325.00</u>
<b>TOTAL</b>	<b>2,256.07 acres</b>

The site has been used for row crop farming since the mid-sixties. The proposed dairy covers 325 acres, milking 6,000 cows with all support stock kept on site. Milk cows are housed in freestalls and support stock is housed in open corrals with shades. Manure collection will be accomplished by regular flushing of all free stall barns and the feed lanes of the open corrals. Hutches for the small calves are located in the middle of the dairy on the west side. All corrals and feed storage areas are sloped to a collection system connected by pipeline to multiple pond liquid retention facility. The principal features of the dairy are shown on the site plan. Development consists of corrals, freestalls, shades, commodity barn, hay barns, and liquid storage ponds. The planned facility will house 6,000 Holstein milk cows with a total of 14,474 Animal Units on site.

*Larry A. Shehadey Dairy*  
*A New Facility*

**C. Soils**

There are numerous soil types within the boundaries of this property. Table 4, in the Hydrological / Geological Report (Section 7) summarizes the included soil types by map symbol, depth, and percentage of clay content. This information was obtained from the Soil Survey of Fresno County, prepared by the U. S. Department of Agriculture, Soil Conservation Service. Soils under the dairy site are dominated by the Chino and Traver series. These soils have been leveled, are moderately well drained soils with a clay subsoil formed in old alluvium from sedimentary rock.

Clay content of soils underlying the dairy facility averages from 5% to 35% with moderate permeability. As such, the potential for rapid downward migration of nitrogen and salt may be limited when applying irrigation water at rates adequate to satisfy crop needs.

**D. Groundwater**

A review of the State of California Department of Water Resources Groundwater Level Data Retrieval Map Interface shows on average, since 1962, shallowest water depth to be between 22 feet and 26 feet below ground surface in the wells nearest the proposed dairy. Table 1. In the Hydrological / Geological Report details shallowest, deepest, and average depth to groundwater reported by the Department of Water Resources web site for 15 area wells. Individual well data is included as Appendix A.

Depth to groundwater beneath the proposed lagoon bottom is estimated to be greater than twenty-five (25) feet. See the Hydrological / Geological Report, Section 6, of this report page 10.

Typically groundwater gradient tends to follow topography, in this case, to the southwest. Water needs for the dairy will be supplied by well(s) located near the milk barn.

Water from fifteen (15) agricultural wells and one domestic well were analyzed and found to be of fair quality. Nitrate nitrogen was less than 10 mg/L in all samples.

The site is located outside the 100 year flood-zone, entirely in Flood Zone C which is defined as "Areas of minimal flooding." FEMA FIRM Community Panel Number 065029 0850 B, 12/1/82.

Annual rainfall for the 120 day period averages 6.30 inches per year. The 25 year 24 hour storm event for the area is 2.00 inches (page 6 of the Hydrological/Geological Report, Section 6).

*Larry A. Shehadey Dairy*  
A New Facility

**E. Dairy Operation**

The dairy and feed storage areas take up about 325 acres twelve (12) miles west of the city of Kerman in Fresno County. The balance of the 2,256 acres (1,847 acres) is open farm ground. The planned rotation of crops on the open ground includes alfalfa, wheat (silage) double cropped to corn (silage) almonds and grapes. These crops utilize nutrients in manure water which will be generated in the operation of the dairy.

**1. Dairy Manure Generated**

The quantity and makeup of manure generated by a dairy depends on the breed, total number of animals, the distribution of animal numbers within age groups, and housing facilities. Animal unit factors are from Fact Sheet for Dairies No. 4

Breed: **Holstein**

Age group	Head	Animal Unit Factor	Animal Units
Milk Cows	6,000	1.40	8,400
Dry Cows	1,200	1.12	1,344
Heifers 1 to 2 years	3,240	1.02	3,305
Heifers 3 months to 1 year	2,430	0.49	1,191
Calves	810	0.29	235
TOTAL	13,680		14,474

The following table demonstrates the herd makeup in animal units and the respective volumes of manure in its wet or dry category where the milking and dry cows are housed in freestalls, and all support stock are kept in open lot corrals with shades.

Age Group	Animal Units	%Collected In flush	Wet Manure	Dry Manure
Milk Cows	8,400	80.00	6,720	1,680
Dry Cows	1,344	60.00	806	538
Heifers 1 to 2 years	3,305	60.00	1,938	1,322
Heifers 3 months to 1 year	1,191	60.00	714	476
Calves	235	0	0	235
TOTAL	13,680		10,224	4,251

*Larry A. Shehadey Dairy*  
*A New Facility*

Process water generated will consist of barn wash water, sprinkler pen runoff and water used to cool barn equipment. This water will be collected by the drainage collection system and transported to the solid separation system. Some of the solids collected are transported off site for use as fertilizer/soil amendment. Rain runoff is conveyed to the storage pond to be blended with irrigation water for application to crops. Dry manure is scraped into piles in the corrals where it is stored prior to removal for application to fields or transportation offsite for use as fertilizer or soil amendment.

## **2. Manure Water Storage**

The manure water is conveyed to the storage pond. The Clean Water Act requires storage capacity to contain all dairy process water and contaminated rain runoff without discharge off of dairy property, except during storms exceeding the 25 year - 24 hour event criteria. Section 4, Sheet D shows the designed combined capacity of the proposed water storage ponds. Available storage capacity, net of the required two(2) feet of freeboard, is calculated to be 9,745,527 cubic feet. "Freeboard" refers to an unused space between the maximum water level in regular use and the top of the lagoon bank. This area provides additional storage during emergency situations. Section 4, Sheet C demonstrates how the capacity required to support the proposed animal population liquid waste, wash water, and contaminated rainwater runoff was determined. This storage requirement is calculated to be 9,367,510 cubic feet. The excess storage capacity is available in the event of a very wet year, irrigation timing and accumulation of solids.

## **3. Dry Manure**

The corrals will be built on soils with 10% to 35% clay in the upper 60 inches of the soil profile. All corral areas are sloped to prevent creation of ponds of water and to divert and convey rainwater runoff to the storage ponds. Livestock traffic on generated solid wastes overlying soils tend to form a seal that prevents downward movement of wastes. The seal will be very effective on soils having up to 35% clay.

The corrals will be periodically scraped to limit manure accumulation and to enhance drainage. Care will be taken to assure that the seal will not be disturbed during scraping. Collected manure will be stored in a location which drains to the liquid storage system for convenient transportation either on-site or off-site for use as a fertilizer and/or soil amendment. On-site use will be in amounts appropriate for crop needs with verification by regular analysis of both the dry manure and soils. Records will be kept on the amount

*Larry A. Shehadey Dairy*  
*A New Facility*

of dry manure (if any) taken off-site.

Section 5, Sheet B shows that 13,598 tons of dry manure (60% dry matter) will need to be removed annually to assure compliance with current regulations. Manure will be analyzed to insure that application rates and removal amounts are appropriate.

#### **4. Manure Water Utilization**

Manure water accumulated in the storage pond will be used to supply nutrients to crops. The nutrients contained in manure water will be used to support growth of the planned crop rotation of alfalfa, double cropped silages, grapes and almonds. No manure water is proposed to be applied within 100 feet of a water well which is not protected by an annular seal.

Lagoon water will be picked up by a sump pump and pumped to a mixing structure where it will be blended with fresh irrigation water prior for distribution to various fields through a connected pipeline system.

Mixed irrigation water and manure water will be regularly analyzed to monitor fertilizer application rates.

## **F. Nutrient Management Plan**

### **1. Irrigation Requirements of Growing Crops**

Irrigation of the typical crop rotation of alfalfa , wheat silage, and corn silage requires a total of 6,231 acre feet of water to meet crop requirements on an annual basis (Section 5, Sheet E). The amount of water generated by the dairy operation, normal rainwater runoff, and the runoff from a 25 year, 24 hour storm event will be approximately 408 acre feet. This is approximately 6.5 percent of the total crop water requirements. This will allow sufficient flexibility to match nitrogen application of manure water with the crop needs during scheduled irrigations. The lagoons are sized to accommodate a minimum of 120 days of generated manure water. The liquid storage ponds are plumbed so that accumulated water and manure can be distributed to all contiguous crop producing areas.

*Larry A. Shehadey Dairy*  
*A New Facility*

**2. Nutrient Uptake**

Section 5, Sheet A shows that 487,263 pounds of nitrogen will be produced in the wet manure by the dairy as operated. Section 5, Sheet B demonstrates that under the normal crop rotation, nitrogen demand is 873,805 lbs. annually. The additional nitrogen needed will come from a combination of some of the dry manure produced and specifically selected chemical fertilizers.

Section 5, Sheet A shows that the 4,813,829 pounds of “salts” in the “wet” manure, would result in an application rate of 2,606 pounds per net farmable acre. Total annual “salt” production of 6,815,271 pounds requires removal of at least 13,598 tons of dry manure will result in an application rate below the suggested 3,000 pounds per acre maximum annually.

**3. Nutrient Distribution**

The liquid manure water will be metered into the irrigation system and blended in a ratio not to exceed one part manure water to three parts fresh irrigation water. This ratio is consistent with manure water application rates recommended by the University of California Co-Operative Extension. The metered blending of manure water with fresh irrigation water in the system will provide an even distribution of both nitrogen and water the full length of the irrigation area. The permeability of the soils being farmed assists in even distribution of irrigation water and included nutrients. Irrigation tailwater will be collected in the existing tailwater collection system which returns the collected tailwater to the irrigation system.

Section 5, Sheet E demonstrates the approximate amount and timing of applications of mixed irrigation/manure water through the growing cycle of the crop rotation proposed. These calculations include adjustments for the relative permeability of the soil types found on the property, irrigation efficiency of border and row irrigation, and of average slope .

Applications of early-spring dry manure and rates of application of metered manure water will be adjusted in response to shallow bore soil samples and periodic petiole samples. The monitoring of soils and crops will help prevent over-use of manure and the resulting possibility of forcing excess nitrogen into the underground water supply.

*Larry A. Shehadey Dairy*  
*A New Facility*

**Summary, Conclusions, and Recommendations**

The recommended plan herein for management of manure, manure water and stormwater runoff from this dairy is designed to minimize the potential for surface and groundwater quality impact. The plan is based, in part, on anticipated values, manure water volume, and nitrogen and salinity constituent concentrations. The recommended cropland application program is consistent with acceptable agronomic practices given the site conditions and typical crops of wheat silage, corn silage, alfalfa, grapes, and almonds. Should changes in crop selection occur, revisions to the plan may be necessary to be consistent with acceptable agronomic practice.

Upon implementation, the cropland and manure water monitoring programs will allow for evaluation of possible modifications to the cropland application program to ensure continued protection of groundwater quality and maintaining crop productivity.

**Limitations**

This report has been prepared for the exclusive use of Larry A. Shehadey Dairy and the California Regional Water Quality Control Board. It is expressly prohibited for others to rely on this report unless given written consent by Livingston Dairy Consulting, Inc.

This report has been prepared in accordance with generally accepted methodologies and standards of practice in the area and is limited to the scope of work described herein. No other warranty, either expressed or implied, is made as to the findings or conclusions included in this report. The findings and conclusions presented are based on field review and observations, and the data obtained from the sources listed in the report, and are valid as of the date of the report. The passage of time, natural processes or human intervention on the Site or adjacent properties and changes in the regulations can cause changed conditions which can invalidate the findings and conclusions presented in this report.

It should be noted that the California Regional Water Quality Control Board, Central Valley Region relies on Fact Sheet 4 in determining animal unit values based on a 1,000 pound cow. In addition to the new values for animal units, those for manure volume and nutrient content and denitrification have also been changed to conform to Fact Sheet 4. All applications and reports must be submitted using these values.

# California Regional Water Quality Control Board

DATE: February 6, 2004  
Gross Acres

## WASTE DISCHARGE REPORT

FOR: **Larry A. Shehadey Dairy**  
**24387 W. Whitesbridge Road**  
**Kerman, CA 93630**

APN:	15-06-12	160
	15-06-14	240
	15-06-44	240
	15-06-46	160
	15-06-52	119.48
	15-06-53	367.75
	15-06-54	80
	15-06-55	160
	15-10-08	326
	15-10-19	78
	15-10-21	325

**1. Proposed Site:** 2,256 Total acres

NEW DAIRY

Dairy site: 324.6 ± acres

Net farmable acres: 1,847 ±

TOTAL ACRES 2,256 ±

**2. Animal Unit Calculations:** Based on CRWQCB Fact Sheet #4 for Holstein cows

	<u>HEAD</u>	<u>FACTOR</u>	<u>ANIMAL UNITS</u>
Milk cows	6,000	1.4	8,400
Dry cows	1,200	1.12	1,344
Heifers 1 to 2 years	3,240	1.02	3,305
Heifers 3 mo to 1 year	2,430	0.49	1,191
Calves	<u>810</u>	0.29	<u>235</u>
TOTALS	13,680		14,474

**Animal units per net crop acre: 7.84**

**C. LIQUID MANURE GENERATION CALCULATIONS - SEE ATTACHED SHEET 'A'**

Nitrogen requires: 1,147 acres                      Salt requires: 1,005 acres

**D. NUTRIENT DISTRIBUTION CALCULATIONS - SEE ATTACHED SHEET 'B'**

Minimum dry manure taken off site: 13,598 tons

**E. MANURE WATER AND STORM WATER GENERATION CALCULATIONS - SEE ATTACHED SHEET 'C'**

Capacity required: 9,367,510 cubic feet

**F. LAGOON CAPACITY CALCULATIONS - SEE ATTACHED SHEET 'D'**

Capacity proposed: 9,745,527 cubic feet

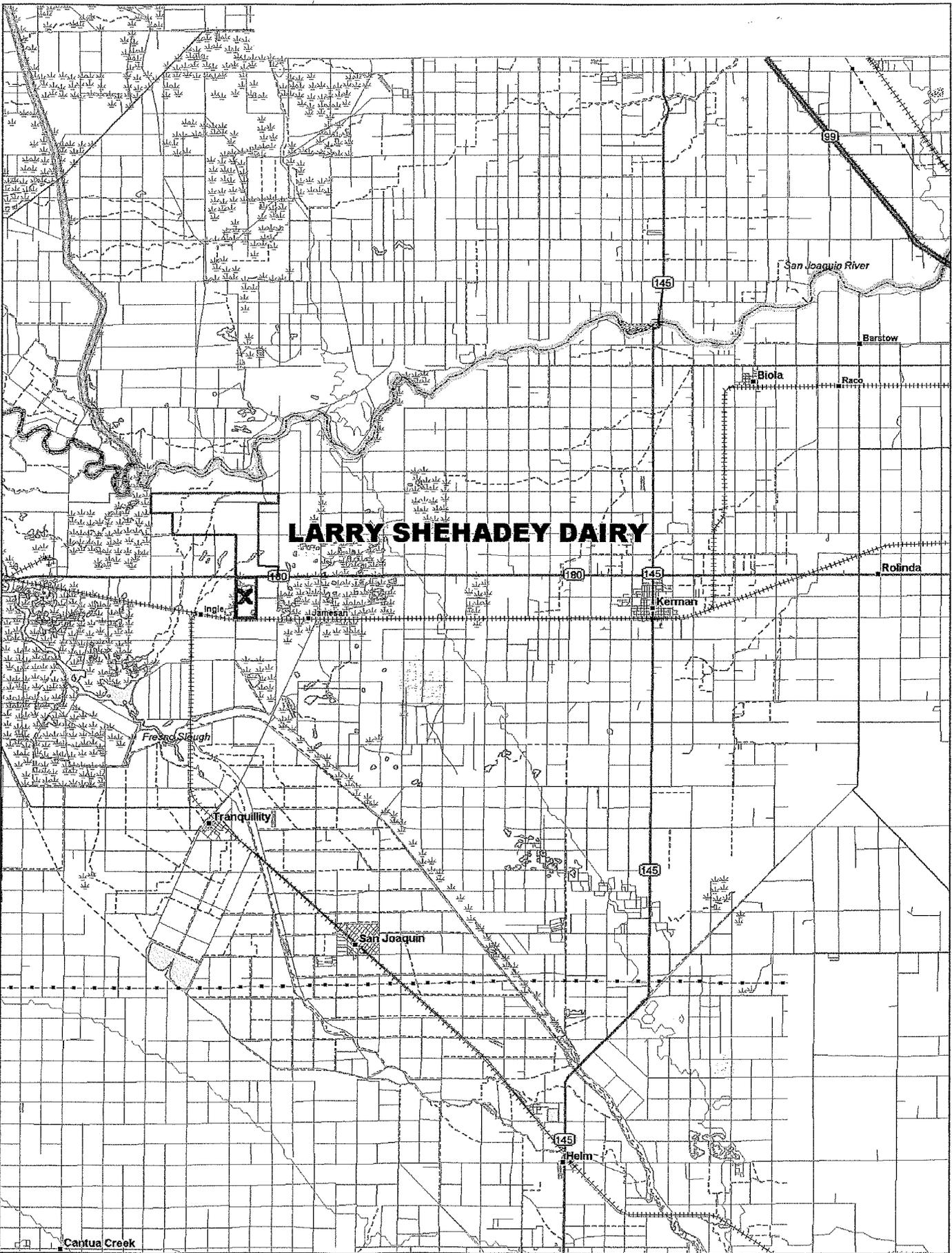
**G. IRRIGATION WATER USE CALCULATIONS - SEE ATTACHED SHEET 'E'**

**H. FEHMA FLOOD ZONE DESIGNATION AREA: Zone C "areas of minimal flooding"**

FIRM Community Panel Number 065029 0850 B December 1, 1982

**Two – Facility Maps**



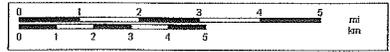


# LARRY SHEHADEY DAIRY



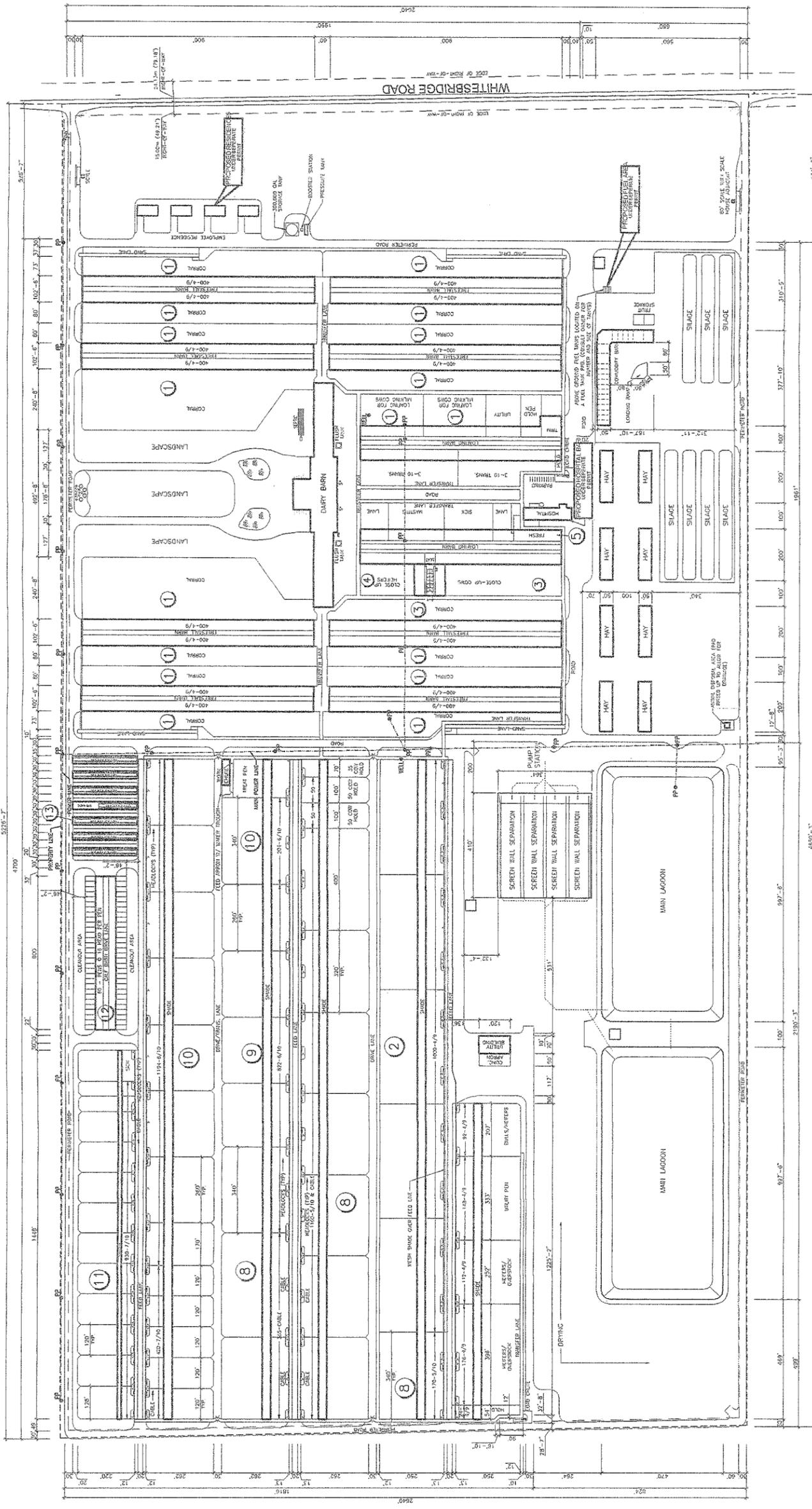
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www.delorme.com

Scale 1 : 200,000  
1" = 3.16 mi





	<b>VALLEY MANAGEMENT SYSTEMS</b> DESIGN and ENGINEERING 1719 K. 11th Ave. Hanford, Calif. 93230 (559) 584-0149	<b>LARRY A. SHEHADEY</b> A NEW DAIRY FACILITY FOR: FRESNO COUNTY, CALIFORNIA	DATE ISSUED 01-18-2004 05-19-2004 08-11-2004 08-24-2004	PROJECT 02-021 DRAWN E. LITTLE CHECKED P. COPE SHEET <b>2</b> OF
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**SITE PLAN**

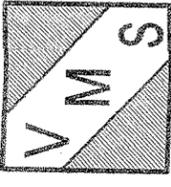
SCALE: 1" = 200'-0"

N

HERD MAKE-UP		ANIMALS (AS DESIGNED)	ANIMALS (REQUIRED)
#	TYPE	STANCHIONS	ANIMALS (REQUIRED)
1	MILK COWS	4/9	6216
2	DRY COWS	4/9	1067
3	F/C HEIFER	4/9	400
4	TRANSITION COWS	4/9	340
5	FRESH	4/9	84
6	CLOSE-UP	4/9	216
7	SPRINGERS	4/9	110
8	HEIFER 7-23mo	5/10&CABLE	1695
9	HEIFER 14-18mo	6/10&CABLE	822
10	HEIFER 6-13mo	CABLE	1398
11	YOUNG STOCK 5-8mo	CABLE	1,350
12	YOUNG STOCK 3-4mo	CABLE	960
13	CALVES 0-2mo	HITCHES	1,082
<b>TOTAL ANIMALS</b>			<b>15,411</b>
			<b>14,684</b>





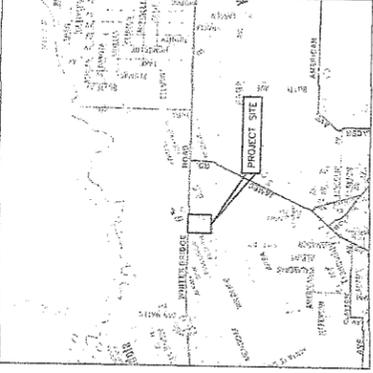


**VALLEY MANAGEMENT SYSTEMS**  
DESIGN and ENGINEERING  
1719 N. 11th Ave.  
Hanford, Calif. 93230  
(559) 584-0149

**LARRY A. SHEHADEY**  
A NEW DAIRY FACILITY FOR:  
FRESNO COUNTY, CALIFORNIA

DATE ISSUED: 08-21-2003  
09-21-2003  
10-21-2003  
01-27-2004

PROJECT: 02-071  
DRAWN: E. LYBLE  
CHECKED: R. COPE  
SHEET: 1  
OF: 1



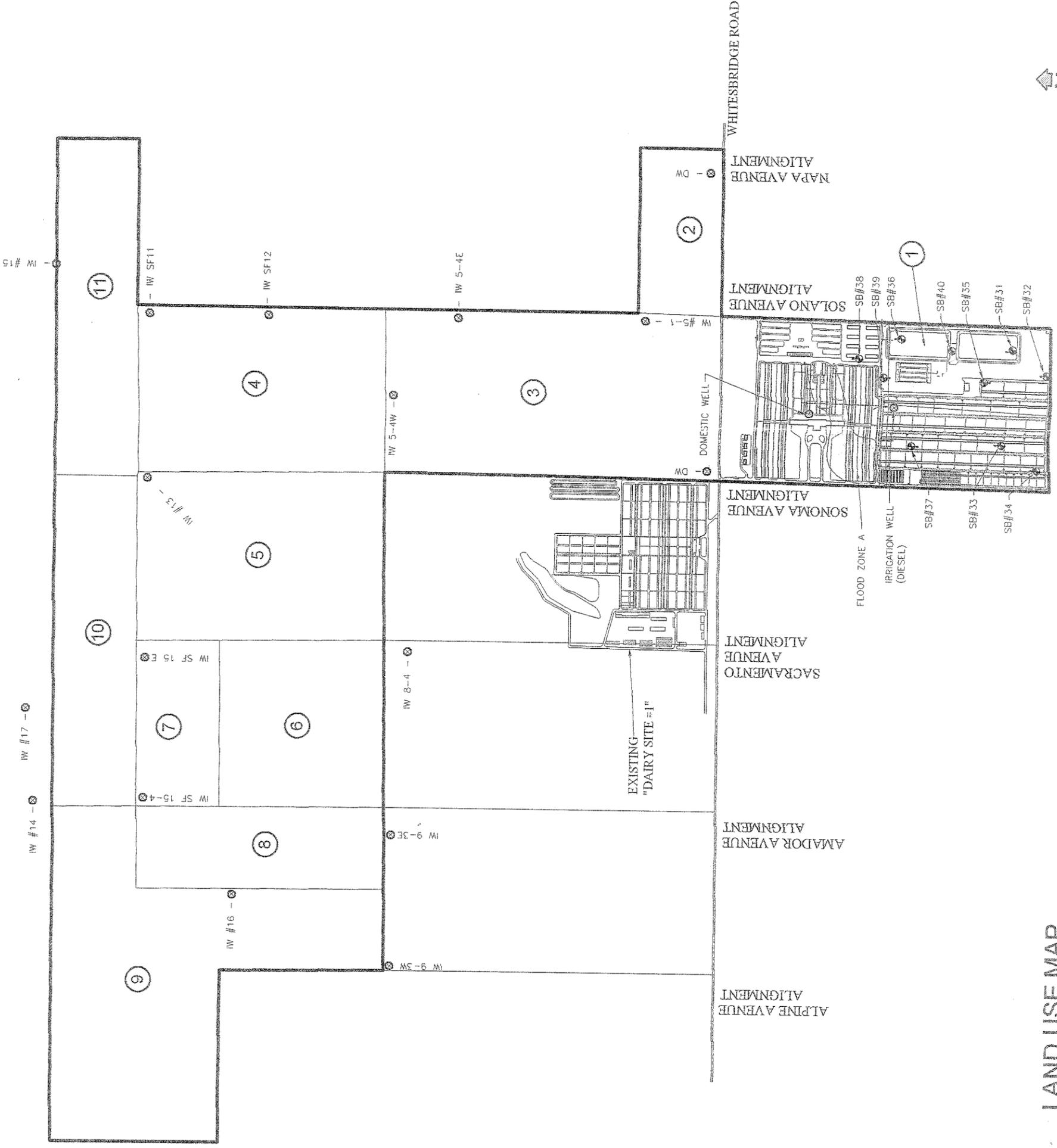
**VICINITY MAP**  
1/10 SCALE

**SITE DATA**

OWNER:	Larry A. Shehadey P.O. Box 231 Fresno, CA 93715	559-917-5055
JURISDICTION:	Fresno County	
ZONE:	Agriculture	
SITE AREA:	324.00	
A.P.N.:	015-100-21s	
SITE ADDRESS:	24387 Whitesbridge Road Keirman, CA	
WATER:	Domestic Well	
SEWER:	Septic Tank	
GAS:	Propane	
ELECTRIC:	PG & E	

**DAIRY SITE 2**

SUPPORTING ACRES	APN #	ACRES
1	015-100-21s	324.00
2	015-100-19s	78.00
3	015-100-08s	326.00
4	015-060-44s	240.00
5	015-060-14s	240.00
6	015-060-46s	160.00
7	015-060-54s	80.00
8	015-060-52s	119.48
9	015-060-53s	368.00
10	015-060-55s	160.00
11	015-060-12s	160.00
DAIRY SITE #2		324.00
FARM ACRES		1931.00



**LAND USE MAP**  
SCALE: 1"=800'-0"

## **Three – Nutrient Disposal Plan**



	Head	Factor	AU	% Flush	AU Flushed	% Collected Flush	Total Wet manure	Total Dry manure
Milk Cows	6,000	1.4	8,400	100.00%	8,400	80.00%	6,720	1,680
Dry Cows	1,200	1.12	1,344	100.00%	1,344	60.00%	806	538
Heifers 1-2 years	3,240	1.02	3,305	100.00%	3,305	60.00%	1,983	1,322
Heifers 3 mo to 1 year	2,430	0.49	1,191	100.00%	1,191	60.00%	714	476
Calves	810	0.29	235	0.00%	0	0.00%	0	235
<b>Total</b>	<b>13,680</b>		<b>14,474</b>				<b>10,224</b>	<b>4,251</b>

NETROGEN - WET MANURE

Source	AU	N excretion value/day	TOTAL N Produced	minus 75% Denitrification anaerobic pond	minus 0% Denitrification solid separator	N produced
Milk Cows	6,720	0.56	1,373,568	1,030,176	0	343,392
Dry Cows & Heifers	3,504	0.45	575,483	431,612	0	143,871
<b>Total</b>	<b>10,224</b>					<b>487,263</b> lbs.

**REQUIRES**

**1,147**

@ 425 lbs. N per acre

NETROGEN - DRY MANURE

Total AU	"Salts" Production Rate/day	TOTAL "Salts" Produced	minus Separator Removed "Salts"	"Salts" Production
10,224	1.29	4,813,829	0	4,813,829 lbs.

**REQUIRES**

**1,605** acres

@ 3,000 lbs. "SALTS" per acre

NETROGEN - DRY MANURE

Source	AU	N excretion value/day	TOTAL N Produced	plus N from Solids Separator	minus 75.00% Denitrification	N Produced
Milk Cows	1,680	0.56	343,392	0	257,544	85,848
Dry Cows & Heifers	2,571	0.45	422,237	0	316,678	105,559
<b>Total</b>	<b>4,251</b>					<b>191,407</b> lbs.

NETROGEN - DRY MANURE

Total AU	"Salts" Production Rate/day	TOTAL "Salts" Produced	plus Separator Removed "Salts"	NET "Salts" Production
4,251	1.29	2,001,442	0	2,001,442 lbs.

Notes:

1. Excretion values used by Regional Water Quality Control Board for a high producing herd.

2. Denitrification values accepted by Regional Water Quality Control Board.

# Larry A. Shehadey Dairy

24387 W. Whitesbridge Road, Kerman, CA 93630

(559) 264-6583

	AU		Produces	0.56 lbs.	Nitrogen	per head per day	
	and		Produces	1.29 lbs.	"Salts"	per head per day	
14474.4 AU	X	0.56 lbs.	X	365 days	=	678,670 lbs/year	N
14474.4 AU	X	1.29 lbs.	X	365 days	=	6,815,271 lbs/year	"Salts"
				<u>N</u>		<u>"Salts"</u>	
				678,670		6,815,271	

## Potential Crop Nutrient Uptake

Alfalfa		670,080 lbs.	1,361,100 lbs.
1396 acres			
Oat Silage - Double Cropped		101,400 lbs.	152,256 lbs.
312 acres			
Corn Silage - Double Cropped		78,000 lbs.	152,256 lbs.
312 acres			
Almonds		24,325	135,525
139 acres			
		0	0
0 acres			
		0	0
		873,805 lbs/year	1,801,137 lbs/year
<b>DIFFERENCE</b>		-195,135 lbs.	5,014,134 lbs.

### TO BALANCE N:

OFF SITE minimum

0 TONS OF DRY (60% DM) MANURE

\* "Salts" content=4.5lbs  
lbs. "salts" X 1 lbs. N)

6,815,271 lbs. divided by

1,847 acres = **3,690 lbs/acre**

### TO BALANCE "SALTS":

@ 3,000 per acre for double crop, 2000 lbs per acre single crop

OFF SITE minimum

**13,598** TONS OF DRY (60% DM) MANURE

**SHEET 'B'**

IRRIGATION SCHEDULE - ACRE FEET PER MONTH

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
ALFALFA	0	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.3	0.2	0	0	3.4
WATER	0	0.3	0.3	0.3	0	0	0	0	0	0.2	0.2	0	1.3
CORN	0	0	0	0	0.3	0.3	0.4	0.5	0.4	0	0	0	1.9
ALMONDS	0	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0	0.3	0.2	0	3.5
Total/mo	0	0.8	1	1	1.1	1.3	1.5	1.6	0.7	0.7	0.4	0	10.1

1,847 Acres farmed

IRRIGATION WATER

Required	0	414	568	568	708	861	1,032	1,063	544	383	90	0	6,231.30
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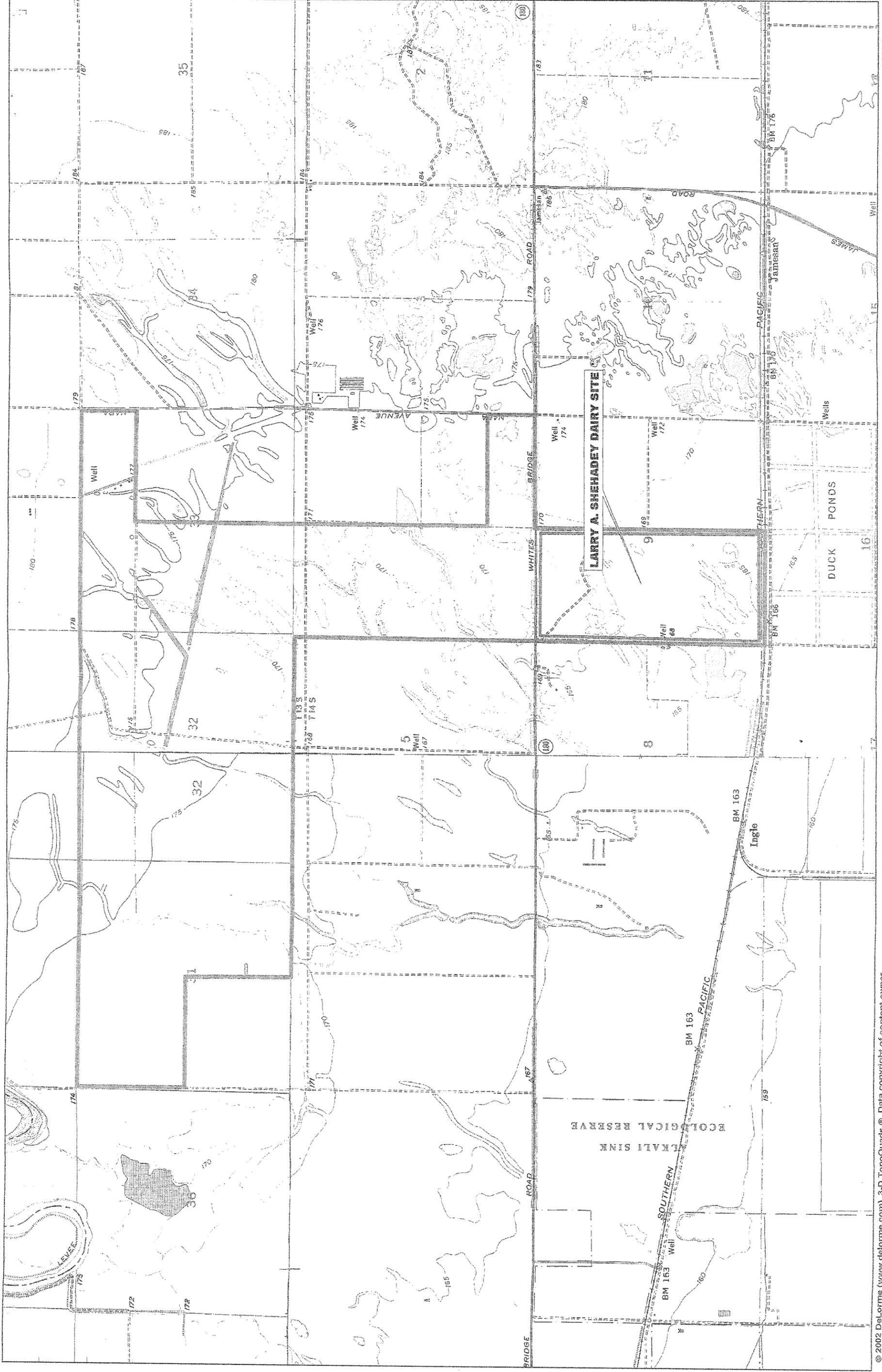
LAGOON WATER 300,000 gallons per day

ACRE FEET PER MONTH

Generated	28	28	28	28	28	28	28	28	28	28	28	28	342
Rainwater	17	17									17	17	66
Total/mo	45	45	28	28	28	28	28	28	28	28	45	45	408

Percent total water use  
5.48%  
1.06%  
6.55%







## **Four – Hydrological/Geological Report**



HYDROLOGICAL / GEOLOGICAL  
REPORT

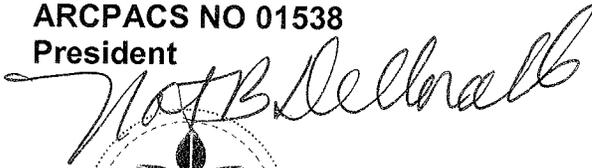
*Prepared for*

SHEHADEY DAIRY

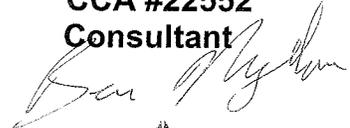
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## SHEHADEY DAIRY

# HYDROLOGICAL / GEOLOGICAL REPORT

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## I INTRODUCTION

This Hydrological / Geological Report was prepared to provide information pertaining to possible permitting requirements set forth by the California Regional Water Quality Control Board and the County of Fresno for the Shehadey Dairy. Shehadey Dairy is seeking a permit for the operation of a new 2,255 acreage dairy facility.

The facility property is located in northwest  $\frac{1}{4}$  and east half of section 31, all of section 32, the west half of section 33, and the north half of the northeast  $\frac{1}{4}$  of section 33 in Township 13S, Range 16E. Also included is the west half of section 4, the south half of the southeast  $\frac{1}{4}$  of section 4 and the west half of section 9 in Township 14S, Range 16E. The specific location of the proposed dairy site will be in the west half of section 9 in Township 14S, Range 16E.

A.P.N. parcel numbers are 015-010-008, 015-010-019, 015-010-021, 015-006-044, 015-006-014, 015-006-046, 015-006-054, 015-006-052, 015-006-053, 015-006-055, and 015-006-012. The property location is depicted in **Exhibit 1, "Site Location Map"**.

Purpose of this report is to assess the hydrological and geological conditions of the proposed dairy site.

## II. HYDROLOGICAL CONDITIONS

### **A. Groundwater Conditions**

#### **1. Water Table Depth**

Depths to groundwater for wells in the vicinity of the proposed dairy reported by Department of Water Resources (**DWR**) are summarized in **Table 1, "Depth to Groundwater in Wells"**. Average groundwater depth for the nine wells listed for the past 30 years ranged from 40 feet to 74 feet. Shallowest and deepest groundwater depth recorded for each well is listed in **Table 1**. The annual **DWR** data can be seen in **Appendix A**. Minimum depth to groundwater during the period was 22 feet below ground level.

Kings River Conservation District's (**KRCD**) 2000 Annual Groundwater Report presents depth to groundwater in the area. According to KRCD, depth to groundwater in the area of the proposed dairy is approximately 70 ft. to 80 ft. This aquifer supplies the majority, if not all, of the irrigation and residential water for the area. A map of the depth to groundwater contours is included as **Exhibit 3**.

Ten soil borings were drilled with a hand auger in the southern half of the proposed dairy facility which includes the manure pond and gravity separation pit area. The borings were sampled to a total depth of 25 feet. Boring locations are depicted in **Exhibit 2, "Land Use Map"**. Groundwater was encountered in two of the soil borings (SB#31 and SB#32) at depths of 25 feet and 18 feet respectively. See **Appendix B, "Hand Auger Soil Boring Log"**.

**Table 1. Depth to Groundwater in Wells**

Well Number	Shallowest Depth to Groundwater		Deepest Depth to Groundwater		Time Period (years)	Average Depth (ft)
	Date	Depth (ft)	Date	Depth (ft)		
14S16E08J001M	1962	22	1981	79	1961-2001	40
14S16E04C001M	1987	46	1975	95	1971-1993	69
14S16E04L001M	1998	35	1996	110	1969-2001	74
14S16E05J001M	1984	34	1992	111	1976-2001	65
14S16E05F001M	1988	33	1992	112	1980-2001	60
14S16E06G001M	1987	22	1994	110	1978-2001	58
14S16E06B001M	1987	30	1992	110	1987-2001	65
13S16E32F001M	1962	26	1997	119	1961--2001	53
13S16E32E001M	1984	5	1997	121	1974-2001	68
13S16E30R001M	1962	26	1994	113	1961- 2000	54
14S16E04D001M	1998	41	1991	114	1980-2001	67
13S16E33L001M	1986	4	1994	118	1977-2001	70
13S16E33F001M	1970	36	1977	128	1967-2001	75
13S16E33B002M	1962	26	1991	125	1961-2003	66
14S16E04A001M	1962	26	1994	107	1961-2001	68

Pump tests were performed on each of the irrigation wells during the period of 1990 to 2002. The depth to the "standing water level" for each of the wells is presented in **Table 2. "PG&E Pump Test Results"**. The complete results for each of the pump tests can be seen in **Appendix G " PG&E Pump Tests."**

**Table 2. PG&E Pump Test Results**

Well	Meter #	Standing Water Level (feet)												
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
14	632R83													150.4
15	789R69							129.0	129.0	111.5	121.2	126.3	137.5	148.0
16	33449R							141.5	145.4	132.0	130.0	132.0	135.5	150.0
5-1	02936R	96.5	144.2	154.3	155.2	150.8	144.5	143.5	158.4	141.5	141.0	150.0	156.0	158.5
5-4E	59R205	80.4	117.0	134.3	147.0	150.4	142.3		147.7	136.3	134.0	143.0	1454.5	154.0
5-4W	4089R9	88.7		166.9	153.4	156.5	145.5	147.2	150.5	137.3		148.0	148.5	151.9
8-4	92929R	85.2	137.1	145.6		150.2	133.5	154.0	141.5	126.3	126.0	136.4	145.0	142.5
9-3E	66590T	71.5	132.0		121.0	137.5	124.5	129.5	131.0	116.3	124.3	123.2	123.0	
10-4	R05985			133.9	120.4	139.3	123.8	129.7	130.8	113.8	122.7	121.2	118.9	126.2
SF 11	4086R	90.2	126.1	146.6	130.6	143.5	141.6	133.2	129.0	124.3	116.0	126.1	128.0	140.0
SF 12	2400R0		83.1	168.2	162.5	169.8	155.7	155.9	155.0	148.4	138.0	113.5	150.0	158.5
SF 13	6473R7	90.4	131.7	156.0	128.7	159.0	147.3	142.7	140.5	138.4	132.0	144.3	145.0	160.2
SF 15E	R06337	94.5	146.0	155.5	141.7	158.5	142.9	148.5	142.6	138.5	129.2	124.7	139.0	162.0
SF15-4	45R771		131.7	127.4	125.2		124.5	133.0	129.5	114.5	120.0	113.0	129.3	140.3

## 2. Groundwater Flow

Groundwater flows towards the southeast. Flow gradients can be seen in **Exhibit 4, "Lines of Equal Elevation of Water in Wells Unconfined Aquifer for the Kings Groundwater Basin"**, prepared by Kings River Conservation District.

## 3. Area Influences

The San Joaquin River is approximately 2.5 to 3 miles north of the dairy site. Highway 180 is adjacent to the north boundary of the dairy site between the dairy site and the San Joaquin River. Highway 180 acts as a barrier between the dairy and the San Joaquin River.

The Fresno Slough Bypass is located approximately 2.5 miles south of the dairy site and between 3.5 to 6 miles south of the reclamation fields. Water has run in the Fresno Slough Bypass in twenty out of the past forty-six years (1954-2000). Floodwater flow is presented in **Appendix H, "Flood Release Data"**, recorded by the Kings River Conservation District

The Southern Pacific Railroad track is adjacent to the southern boundary of the dairy site and provides a boundary between the dairy and irrigated cropland south of the dairy.

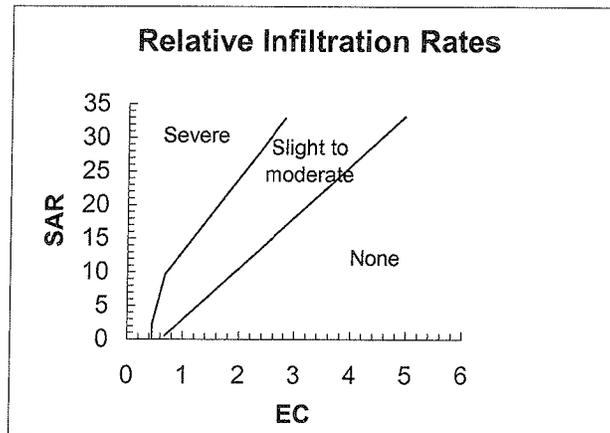
The proposed dairy is located on and bordered by irrigated cropland to the east. The property to the west is native. Lenses of clay layers in the soil profile may restrict the amount of water that seeps down to the deeper aquifers.

## B. Groundwater Quality

Salinity impacts plant growth by reducing the ability of plants to extract water from soil. Yield reduction occurs when salinity induced water stress results over a significant period of time. As salinity increases above threshold salinity, plant growth and yield are reduced. Both threshold salinities and the rates at which yields decrease above the thresholds, (salt tolerance coefficients), are presented for selected crops in **Table 4. "Relative Salt Tolerance and Yield of Selected Crops"** of **Section III. A. Soil Conditions**. Actual tolerances are determined by factors beyond the scope of this report.

Salinity and sodicity interact to effect permeability including infiltration and percolation rates. Where salinity is sufficient, permeability will be adequate, even if exchangeable sodium is high. The relationship between salinity, sodicity, and permeability for irrigation water is presented below in **Figure 1. "Relative Infiltration Rates"**. As the Sodium Absorption Ratio (SAR) increases, permeability decreases if salinity ( $EC_w$ ) remains constant. If sufficient salinity ( $EC_w$ ) is maintained as the SAR increases, permeability will also be sustained. A similar relation exists for soil salinity, ESP and permeability. These relationships are discussed in **Section III. A. Soil Conditions**.

Figure 1. "Relative Infiltration Rates



### 1. Well Water Quality

Well water samples were taken during April, May and October of 2002 from fifteen agricultural wells and one domestic well located on the property. Laboratory analyses results (Lab No's. 57799, 57845, 57919, 63164, & 63293) are attached as **Appendix C**. Well locations are depicted in **Exhibit 2. "Land Use Map"**. Well water salinity levels (EC), Sodium Absorption Ratio's (SAR), Nitrogen levels (NO<sub>3</sub>-N, NH<sub>4</sub>-N, and TKN), boron (B), and chloride (Cl) levels are listed in **Table 3. "Well Water Quality"**.

Table 3. Well Water Quality

Sample Description	NO <sub>3</sub> -N mg/l (ppm)	NH <sub>4</sub> -N mg/l (ppm)	TKN mg/l (ppm)	Total Nitrogen (Lbs/AF)	Total Salt ECw (mmhos/cm)	Sodium Absorption Ratio (SAR)	B mg/l (ppm)	Cl meq/l
Well # 14	<0.1	<0.1	0.7	1.9	0.2	3.8	<0.1	0.4
Well # 15	<0.1	<0.1	0.3	0.8	0.4	11.6	<0.1	1.3
Well # 16	<0.1	<0.1	<0.1	0	0.7	29.0	0.2	3.2
Well 5-1	<0.1	<0.1	0.4	1.1	2.3	19.7	0.2	19.1
Well 5-4E	<0.1	<0.1	<0.1	0	1.7	23.3	0.1	12.1
Well 5-4W	<0.1	<0.1	<0.1	0	1.1	27.9	0.1	8.5
Well # 8-4	<0.1	<0.1	<0.1	0	0.4	11.2	0.1	0.5
Well # 9-3E	<0.1	<0.1	<0.1	0	0.8	43.7	0.2	4.6
Well # 10-4	<0.1	<0.1	<0.1	0	0.9	38.1	0.3	5.9
Well SF-12	<0.1	<0.1	0.3	0.8	0.7	47.6	<0.1	4.6
Well SF-11	<0.1	<0.1	0.1	0.3	0.7	26.1	<0.1	3.6
Well SF-13	<0.1	<0.1	0.1	0.3	0.6	36.9	<0.1	2.5
Well SF-15 E	0.1	<0.1	0.5	1.6	0.6	26.9	0.1	2.5
Well SF 15-4	<0.1	<0.1	<0.1	0	0.4	30.4	0.1	1.4
Dairy #2 domestic	<0.025	<0.1	0.5	1.4	2.8	19.7	0.3	20.8
Dairy #2 Diesel Ag Well	0.2	<0.1	0.3	1.4	5.4	24.0	1.4	47.5

Relative infiltration rates for one of the agricultural wells is in the "None" (no restriction) range, four are in the "Slight to Moderate" range and ten are in the "severe" range. All the wells in the "Severe" range have low total salt contents ( $EC_w$  at 0.7 mmhos/cm or below). As stated previously, it will be important to maintain adequate salinity ( $EC_w$ ) to maintain adequate water infiltration for the wells in the "Severe" range.

Salinity ( $EC_w$ ) concentrations for eleven of the wells are at or below 0.7 mmhos/cm, which may cause water penetration problems. Although the overall salt concentration is low, the predominating salt present is sodium (Na), which will also contribute to possible water penetration problems. Sodium will accumulate in the soil over time and will require occasional gypsum applications to help leach the sodium from the root zone. Soil drainage will be important in preventing salts from accumulating in the soil.

Salinity ( $EC_w$ ) concentrations in most of the well waters are satisfactory for wheat, barley, cotton, corn, alfalfa and most vegetable crops, see **Table 4. "Relative Salt Tolerance and Yield of Selected Crops"**.

Boron (B) concentrations are in the <0.1 to 0.3 mg/l range for fourteen of the agricultural wells with the diesel ag well (south of Highway 180) having a boron concentration of 1.4 mg/L. Wheat is sensitive to boron in the 0.75 – 1.0 mg/l range. All the other forage crops, field crops, and vegetable crops are tolerant to boron at or above 2.0 mg/l. Boron (B) levels are in satisfactory ranges for crop production.

Overall chloride (Cl) concentrations are in satisfactory ranges for field and forage crops in most of the agricultural wells. Most annual crops and short season perennials are moderately to highly tolerant to chlorides. Moderately tolerant crops can sustain chloride concentrations in the 4 – 10 meq/L range, while tolerant crops can handle concentrations above 10 meq/L. Twelve of the wells have chloride (Cl) concentrations in the 0.4 to 8.5 meq/l range. Wells 5-1 and 5-4E have chloride (Cl) concentrations 19.1 and 12.1 meq/L respectively, while the well south of Highway 180 is at 47.5 meq/L. Those wells with elevated chloride (Cl) concentrations should be blended with water containing lower chloride (Cl) concentrations to minimize possible chloride injury to crops.

State drinking water maximum contamination limit for nitrate nitrogen ( $NO_3-N$ ) established by California Department of Health Sciences is 10 mg/L. The limit for livestock suggested by Ayer & Westcot (1985) is 100 mg/L. All wells had nitrate nitrogen ( $NO_3-N$ ) concentrations at 0.2 mg/l or less.

The total nitrogen concentrations for all wells are at concentration of 0.6 mg/L or less. The total nitrogen (TN) present is calculated by adding nitrate-nitrogen ( $NO_3-N$ ), ammonia-nitrogen ( $NH_4-N$ ), and organic-nitrogen (Org-N). Total kjeldahl nitrogen (TKN) is made up of both ammonia-nitrogen and organic-nitrogen. Subtract the ammonia portion from the TKN to obtain the organic portion.

Nitrogen in the organic form is not available to crops. Microorganisms utilize organic material resulting in conversion of organic nitrogen to ammonium and then nitrate nitrogen. The neutralization rate, and therefore timing of plant availability is dependent upon environmental factors and has not been presently determined.

This property has been actively farmed for over twenty years using the water from these irrigation wells. Crop yields have been maintained or have increased over time.

## 2. Well Logs

Well logs for wells located on the property were requested from California Department of Water Resources (DWR). Well locations and the corresponding well numbers can be seen in **Exhibit 2. "Land Use Map"**. Due to inadequate well location descriptions, we were not able to match all the well logs provided to specific wells. We were able to match fourteen out of sixteen wells to specific well logs. Well identification numbers have been added to the well logs and can be seen in **Appendix D**.

## C. Surface Water

No surface water is available. All irrigation water is supplied by wells on the property.

## D. Flood Plain Evaluation

FEMA Flood Zone map for the proposed dairy and reclamation area is shown in **Exhibit 5. "Flood Zone Map"**. The proposed dairy facility and reclamation fields are located in zone X that is outside any 100-year flood zones. There is small areas of Zone A (no base flood elevation determined) designated in the freestall barn and corral area of the dairy facility and one small Zone A area is designated in the reclamation fields.

## E. Rainfall Data

A 25-year 24-hr storm event in the vicinity of the proposed dairy is reported as producing approximately 2.0 inches of water, see **Exhibit 6. "Isopluvials of 25-Year 24-Hour Precipitation in Tenths of an Inch"**. Records provided by Western Regional Climate Center show that the average 120-days (Dec., Jan., Feb., & March) rainfall for surrounding vicinities of the property is 6.30 inches. This average was calculated from 120-day average rainfall data collected from Fresno (a distance of approximately 20 miles east of the dairy facility), which receives an average of 7.8 inches. Five Points (a distance of approximately 30 miles southeast of the dairy facility), which receives an average of 4.71 inches, and Los Banos, (a distance of approximately 48 miles northwest of the dairy facility), which receives an average of 6.38 inches. See **Appendix E. "Period of Record Monthly Climate Summary"**.

### III. GEOLOGICAL CONDITIONS

#### A. Soil Conditions

##### 1. USDA Soil Survey Information

Soil types, as reported by the United States Department of Agriculture Soil Conservation Service, on the dairy site are depicted in **Exhibit 7. "Soil Survey Map"**. The property is approximately 35% Chino series (Cr, Cs), 35% Traver (Tr, Ts, Tt, Tu), and 30% combined varieties that include; Grangeville (Gf.), Hesperia (Hsa, Hsc, Hse, Hsn, Hst), Playas (PI), Pond (Pu, Pw), and Wunje (Ws, Wu) soil series. Soil unit descriptions are presented in **Table 4. "Soil Map Unit Description"**, and soil descriptions in **Appendix F. "USDA NRCS Soil Description"**.

**Table 4.** Soil Map Unit Description

Series	Name	Soil Depth	USDA Texture	% Clay
Cr, Cs	Chino	0-12"	Loam	20
		12-18"	Clay Loam	23
		18-25"	Heavy Fine Sandy Loam	31
		25-60"	Fine Sandy Loam	17-20
Gf	Grangeville	0-60"	Fine Sandy Loam	7-9
Hsa, Hsc, Hse, Hsn, Hst	Hesperia	0-43"	Fine Sandy Loam	No data
		43-75"	Silt	
PI	Playas	---	Too variable to rate*	35-70**
Pu, Pw	Pond	0-5"	Fine Sandy Loam	8-10
		5-8"	Sandy Loam	12
		8-17"	Sandy clay Loam	24
		17-20"	Clay Loam	27
		20-35"	Sandy Loam	11
		35"+	Sand	5
Tr, Ts Tt, Tu	Traver	0-10"	Sandy Loam	6
		10-23"	Light Sandy Clay Loam	5
		23-53"	Sandy Loam	21
		53+"	Silt	8-10
Ws, Wu	Wunje	0-66"	Silt Loam	9-15

\*Playas is not a soil but considered a miscellaneous area or miscellaneous land type that can consist of clay loam, silty clay loam, silty clay or clay with perhaps some thin layers of fine sand.

\*\*USDA soil dataset (estimates) suggests an overall clay percentage of 35 to 70 percent.

Chino (Cr, Cs) soil is moderately well drained soil. Permeability is moderate with moderate to high water holding capacities. Effective rooting depth is 60 inches or more. The Cs series (Chino loam, saline-alkali) is affected by slightly saline-alkaline conditions, but can be managed similar to Chino loam (Cr) if it has been reclaimed.

Traver soil is typically well drained, moderately deep over compacted silt. It is also typically saline-alkaline affected. The Traver sandy loam (Tr) series does not have the compacted silty substratum and is saline-alkaline free in the surface layer. Reclamation of the sub soil is easier because no compacted silty substratum is present. Traver sandy loam, moderately deep (Ts) has compact silty layers at a depth ranging from 36 to 60 inches. The subsoil and the horizons beneath it are normally saline-alkali affected. Traver fine sandy loam (Tt) is similar to that of Traver sandy loam, moderately deep, but has a fine sandy loam surface layer and lacks a compact silty substratum within 6 feet of the surface. Traver fine sandy loam, moderately deep (Tu) is similar to that of Traver sandy loam, moderately deep and strongly saline-alkali affected with only a modest acreage surface layer that was saline-alkali free.

Grangeville (Gf) fine sandy loam series have effective root zone depths of 60 inches or more. Water holding capacities are high. Permeability is moderately rapid. The surface soils (0-8 inches) overlay thick layers of neutral to alkaline fine sandy loam soils. Weak mottling can be present as well as calcareous conditions below 20 inches. Under irrigated conditions, these soils are suited to trees and vines as well as field and truck crops.

Hesperia soils are moderately well drained and are variably saline-alkali affected. Water holding capacities are moderate. These soils are on irrigated cropland that have been leveled, ripped, and reclaimed with soil amendments. Salinity and sodicity limits the kinds of crops that can be grown.

Pond (Pu, Pw) soils consist of saline alkaline soils that are somewhat poorly drained. The surface sandy loam soils are underlain by clay loam and or silty loam soils.

Wunjei (Ws, Wu) soils are typically saline-alkaline silt loam soils. Water holding capacity is high. Soils that have been reclaimed are generally well drained.

Commonly grown crops are; cotton, alfalfa, corn, wheat, barley, grain sorghum, and sugar beets. Addition of organic matter to the soil from solid manure applications should improve soil productivity. However, under sodic conditions, organic matter can contribute to low permeability. Soil organic matter has cation exchange capacity and reacts to sodium, as does clay. The key is the same, maintain adequate salinity, and depress ESP

Threshold salinities and the rates at which yields decrease above the thresholds, known as salt tolerance coefficients, are presented for selected crops in **Table 5. "Relative Salt Tolerance and Yield of Selected Crops"**.



Crops are listed in order of decreasing tolerance to salinity with the most tolerant at the top. Relative  $EC_e$  values associated with increasing degrees of yield reduction due to salinity are listed for each crop. Threshold salinity values are listed under the 100% yield potential. For example, with average root zone salinity of 8 dS/m or less, barley can be expected to produce 100% of its yield potential. As salinity increases above threshold value, yield potential is reduced. Values listed under 0% yield potential represent those at which plants cannot extract any water.

**Table 5. Relative Salt Tolerance & Yield Potential of Crops<sup>1/</sup>**

CROP	Yield Potential									
	100%		90%		75%		50%		0%	
	$EC_e$ <sup>2/</sup>	$EC_w$ <sup>7/</sup>	$EC_e$	$EC_w$	$EC_e$	$EC_w$	$EC_e$	$EC_w$	$EC_e$ <sup>3/</sup>	
Barley grain <sup>4,5</sup>	8.0	5.3	10.0	6.7	13.0	8.7	18.0	12.0	28.0	
Barley forage <sup>4,5</sup>	6.0	4.0	7.4	4.9	9.5	6.3	13	8.7	20	
Wheat <sup>4,5</sup>	6.0	4.0	7.4	4.9	9.5	6.4	13	8.7	20	
Wheat grass, tall	7.5	5.0	9.9	6.6	13	9.0	19	13.0	31	
Cotton	7.5	5.1	9.6	6.4	13	8.4	17	12.0	27	
Wheat grass, standard crested	3.5	2.3	6.0	4.0	9.8	6.5	16	11.0	28	
Tomato	2.5	1.7	3.5	2.3	5.0	3.4	7.6	5.0	13	
Cantaloupe	2.2	1.5	3.6	2.4	5.7	3.8	9.1	6.1	16	
Alfalfa, not tolerant	2.0	1.3	3.4	2.2	5.4	3.6	8.8	5.9	16	
Corn Forage	1.7	1.1	2.5	1.7	3.8	2.5	5.9	3.9	10	
Grape	1.5	1.0	2.5	1.7	4.1	2.7	6.7	4.5	12	
Almond	1.5	1.0	2.0	1.4	2.8	1.9	4.1	2.7	7	
Lettuce	1.3	0.9	2.1	1.4	3.2	2.1	5.2	3.4	9	

1. Taken from Ayers and Westcot (1985), as are notes 1 through 7. Data is for relative tolerances. Absolute tolerances vary depending upon environmental conditions and cultural practices. These data serve as a guide to relative tolerances among crops. Absolute tolerance varies depending upon climate, soil conditions and cultural practices.
2.  $EC_e$  means average salinity of the root zone.
2. The zero yield potential or maximum  $EC_e$  indicates the theoretical soil salinity ( $EC_e$ ) at which crop growth ceases.
3. Barley and wheat are less tolerant during germination and seeding stage.  $EC_e$  should not exceed 4-5 dS/m in the upper (3 to 6 inches) soil during this period.
4. Grains grown for forage are normally less tolerant than when grown for grain.
5. Ranking estimates based upon tests in progress. Grattan, 2001
6.  $EC_w$  means the electrical conductivity of the irrigation water in dS/m.

Management of sodic soils involves application of a source of soluble calcium to increase salinity; replacement of exchangeable sodium with calcium and leaching to displace sodium from the soil profile. Increasing salinity and reducing ESP enhances flocculation. Addition of a salt, such as gypsum, to the soil both increases salinity and provides a source of calcium ions for replacement of exchangeable sodium. Permeability improves as salinity is increased and ESP decreases.

Where salinity is sufficient, permeability will be adequate even if exchangeable sodium is high. **Figure 1, "Relative Infiltration Rates" in Section IV. B. 1. Well Water Quality** presents the relationship between salinity, sodicity, and permeability for irrigation water. A similar relation exists for soil salinity, ESP and permeability. Resulting salinity can then be leached from the soil profile. If salinity is reduced too much before ESP is reduced sufficiently deflocculation occurs and permeability is reduced or stopped.

Keys of effective management of saline sodic soils are to maintain sufficient salinity and calcium ions to maintain permeability; and to leach salts from the root zone until salinity and sodicity are at desirable levels and growing a sequence of crops as with saline soils.

Growth of crops provides several roles. Crops are a source of revenue and remove nutrients from effluent applied to the area. Crop roots penetrate soil promoting soil structure that results in enhanced permeability. Decomposition of crop residues also results in improved soil structure.

## **2. Soil Borings Drilled in the Proposed Pond Areas**

Ten soil borings were drilled with a hand auger to a depth of approximately 25 feet in the area where the dairy facility is to be constructed. Six of the soil borings were drilled in the area of the manure pond and gravity separation pits (SB#31, SB#35, SB#36, SB#38, SB#39, and SB #40). Four of the soil borings were drilled south and west of the manure ponds and gravity separation pits (SB#32, SB#33, SB#34, and SB #37). Boring locations are depicted in **Exhibit 2. "Land Use Map"**. See **Appendix B** for boring logs.

## **3. Soil Borings in the Manure Pond and Gravity Separation Pit Area**

Six soil borings were drilled with a hand auger in the area of the proposed dairy manure ponds and gravity separation pits. Borings were drilled to a total depth of 25 feet. Groundwater was encountered in soil boring SB#31 at a depth of 25 feet. No groundwater was encountered in the other five soil borings

Soil samples from all six borings were submitted to the laboratory for analysis of percent sand, silt, and clay. Mechanical testing is conducted per Western States Laboratory Proficiency Testing Program, Soil & Plant Analytical Methods 1998 Version 4.10, Hydrometer Method S-14.10. Laboratory results can be seen in **Appendix C. "Laboratory Analysis, Report of Mechanical Analysis"** (reports Lab No's: 63178, 63184, 63219, 63532, 63536, and 69768). Soil boring depths, textures and clay content are also listed as follows.

**Table 6. Soil Boring – SB31 (Lab No: 69768)**

BORING DEPTH	USDA SOIL TEXTURE	PERCENT CLAY
0-2'	Sandy Loam	11
2-4'	Loam	19
4-5'	Loam	11
5-6'	Silt Loam	11
6-7'	Silt Loam	10
7-11'	Silty Clay Loam	37
11-12'	Sandy Loam	15
12-13'	Clay	46
13-17'	Silt Loam	8
17-18'	Loam	9
18-25'	Loamy Sand	6

**Table 7. Soil Boring – SB35 (Lab No. 63532)**

BORING DEPTH	USDA SOIL TEXTURE	PERCENT CLAY
0-1'	Sandy Loam	7
1-2'	Loam	15
2-5'	Sandy Loam	9
5-7'	Loamy Sand	3
7-10'	Clay Loam	28
10-14'	Loam	11
14-16'	Sandy Loam	7
16-18'	Loamy Sand	5
18-25'	Sandy Loam	9

**Table 8. Soil Boring – SB36 (Lab No. 63536)**

BORING DEPTH	USDA SOIL TEXTURE	PERCENT CLAY
0-3'	Loam	8
3-7'	Loamy Sand	1
7-10'	Sand	0
10-11'	Sand	1
11-12'	Sand	1
12-16'	Loam	9
16-18'	Sandy Loam	10
18-19'	Sandy Loam	7
19-24'	Loamy Sand	3

**Table 9. Soil Boring – SB38 (Lab No. 63178)**

BORING DEPTH	USDA SOIL TEXTURE	PERCENT CLAY
0-2'	Sandy Loam	10
2-4'	Loam	10
4-5'	Silty Loam	18
5-6'	Sandy Loam	10
6-7'	Silty Loam	14
7-8'	Loam	8
8-9'	Silty Loam	11
9-10'	Silty Loam	14
10-11'	Sandy Loam	8
11-14'	Silty Loam	22
14-15'	Silty Loam	10
15-16'	Silty Loam	8
16-17'	Loamy Sand	7
17-25'	Sandy Loam	10

**Table 10. Soil Boring – SB39 (Lab No. 63184)**

BORING DEPTH	USDA SOIL TEXTURE	PERCENT CLAY
0-2'	Sandy Loam	9
2-3'	Sandy Loam	8
3-4'	Loam	10
4-5'	Sandy Loam	8
5-8'	Sandy Loam	6
8-12'	Loamy Sand	6
12-13'	Sandy Loam	9
13-14'	Sandy Loam	6
14-15'	Loam	13
15-17'	Loamy Sand	8
17-20'	Loamy Sand	6
20-21'	Loamy Sand	8
21-23'	Sandy Loam	12
23-25'	Loam	10

**Table 11. Soil Boring – SB40 (Lab No. 63219)**

BORING DEPTH	USDA SOIL TEXTURE	PERCENT CLAY
0-2'	Sandy Loam	9
2-3'	Sandy Loam	7
3-5'	Loamy Sand	4
5-10'	Sand	3
10-15'	Sandy Loam	7
15-22'	Loam	19
22-23'	Sandy Loam	9
23-24'	Sandy Loam	11
24-25'	Sandy Loam	8

These six soil profiles have alternating soil stratum with more than 10% clay and soils with less than 10% clay. All six soil-boring profiles are characterized by sand, sandy loam, loam, silt loam, silty clay loam and clay loam soils. Clay contents of most of the soils are in the 0% to 28% range.

During excavation of the manure ponds any low clay soils encountered will need to be lined with soils containing 10% clay or more. Soils with adequate clay contents will need to be stockpiled and used to line the low clay areas.

#### 4. Soil Borings West of the Manure Pond Gravity Separation Pits

Four of the soil borings were drilled south and west of the manure ponds and gravity separation pits. Borings were drilled to a total depth of 21 to 25 feet. Groundwater was encountered in soil boring SB#32 at a depth of 18 feet. No groundwater was found in the other three soil borings.

Soil textures in the soil borings were evaluated by feel in accordance with methods outlined in Soil Survey Manual, U.S. Dept. Agriculture Handbook No. 18.

**Table 12. Soil Boring – SB32**

BORING DEPTH	TEXTURE By FEEL
0-2'	Sandy Clay Loam
2-3'	Sandy Loam
3-4'	Loamy Sand
4-8.5'	Sand
8.5-9'	Clay Loam
9-10'	Fine Sandy Loam
10-11'	Fine Sandy Clay Loam
11-14'	Clay Loam
14-16'	Fine Sand
16-18'	Fine Sandy Loam
18-21'	Sand

**Table 13. Soil Boring – SB33**

BORING DEPTH	TEXTURE BY FEEL
0-1'	Sandy Clay Loam
1-2'	Loam
2-3'	Silty Clay Loam
3-5.5'	Clay Loam
5.5-6'	Course Sandy Loam
6-7'	Sand
7-8'	Clay Loam
8-11'	Fine Sand
11-12'	Fine Sandy Loam
12-17'	Fine Sand
17-23'	Sand
23-25'	Silty Clay Loam

**Table 14. Soil Boring – SB34**

BORING DEPTH	TEXTURE BY FEEL
0-3'	Loam
3-4'	Sand
4-5'	Fine Sand
5-7'	Clay Loam
7-9'	Sand
9-13'	Fine Sand
13-15'	Sand
15-18'	Clay Loam
18-21'	Fine Sandy Clay Loam

**Table 15. Soil Boring – SB37**

BORING DEPTH	TEXTURE BY FEEL
0-5'	Silt Loam
5-7'	Clay Loam
7-9'	Fine Sandy Loam
9-10'	Clay Loam
10-12'	Fine Sandy Loam
12-15'	Clay Loam
15-20'	Fine Sandy Loam
20-21'	Sand
14-15'	Loam
15-17'	Loamy Sand
17-20'	Loamy Sand
20-21'	Loamy Sand
21-23'	Sandy Loam
23-25'	Loam

Copies of Figure 1, Exhibits 1 through 7 and Appendices A through H are available on request.



**Appendix D**  
**Comments and Responses**

## **Comments and Responses**

A Notice of Intent to adopt a Mitigated Negative Declaration for the Bar 20 Dairy was circulated on September 14, 2007. The Notice of Intent informed public agencies and interested individuals of the San Joaquin Valley Air Pollution Control District's intent to adopt a Mitigated Negative Declaration. The 30-day public review period for Mitigated Negative Declaration and Initial Study started on September 14, 2007, and ended on October 15, 2007.

Copies of the Notice of Intent to Adopt a Mitigated Negative Declaration together with the Initial Study were delivered to the California State Clearinghouse and mailed to agencies, organizations and interested individuals on September 14, 2007. The Notice of Intent was also published in the Fresno Bee notifying the public of the recommended Mitigated Negative Declaration and Initial Study for the Bar 20 Dairy Project.

### **A. The District received written comments from the following agencies:**

1. Dave Singleton  
Native American Heritage Commission
2. Michael Navarro  
California Department of Transportation
3. Steven M. Hulbert  
David A. Sholes  
California Regional Water Quality Control Board

Copies of these letters are reproduced on the following pages.

COMMENT LETTER 1.

STATE OF CALIFORNIA

Arnold Schwarzenegger, Governor

**NATIVE AMERICAN HERITAGE COMMISSION**

915 CAPITOL MALL, ROOM 9024  
SACRAMENTO, CA 95814  
(916) 833-6395  
Fax (916) 937-5390  
Web Site [www.nahc.ca.gov](http://www.nahc.ca.gov)  
e-mail: [na\\_hc@percboil.net](mailto:na_hc@percboil.net)



September 18, 2007

Mr. Arnaud Marjollet  
**San Joaquin Valley Air Pollution Control District**  
1990 East Gettysburg Avenue  
Fresno, CA 93726-0244

Re: SCH#2007091073: CEQA Notice of Completion: Notice to Adopt a Mitigated Negative Declaration for BAR 20 AIRY Project located at Whites Bridge Road (S.R. 180) near Kernan, Fresno County, California

Dear Mr. Marjollet:

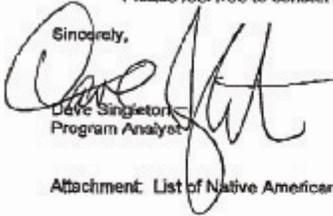
The Native American Heritage Commission is the state's Trustee Agency for Native American Cultural Resources. The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per CEQA guidelines § 15064.5(b)(c). In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE)', and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following action:

- ✓ Contact the appropriate California Historic Resources Information Center (CHRIS). Contact information for the Information Center nearest you is available from the State Office of Historic Preservation (916/853-7278) <http://www.ohp.parks.ca.gov/1088/files/IC%20Roster.pdf>. The record search will determine:
  - If a part of the entire APE has been previously surveyed for cultural resources.
  - If any known cultural resources have already been recorded in or adjacent to the APE.
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - If a survey is required to determine whether previously unrecorded cultural resources are present.
- ✓ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.
  - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological information center.
- ✓ Contact the Native American Heritage Commission (NAHC) for:
  - A Sacred Lands File (SLF) search of the project area and information on tribal contacts in the project vicinity that may have additional cultural resource information. Please provide this office with the following citation format to assist with the Sacred Lands File search request: USGS 7.5-minute quadrangle citation with name, township, range and section.
  - The NAHC advises the use of Native American Monitors to ensure proper identification and care given cultural resources that may be discovered. The NAHC recommends that contact be made with Native American Contacts on the attached list to get their input on potential project impact (APE). In some cases, the existence of a Native American cultural resource may be known only to a local tribe(s).
- ✓ Lack of surface evidence or archeological resources does not preclude their subsurface existence.
- Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
- Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.
- ✓ Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigation plans.
  - CEQA Guidelines, Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave items.

2. ✓ Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15004.5 (d) of the CEQA Guidelines mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.  
✓ Lead agencies should consider avoidance, as defined in § 15370 of the CEQA Guidelines, when significant cultural resources are discovered during the course of project planning and implementation.

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,



Dave Singleton  
Program Analyst

Attachment: List of Native American Contacts

-----Original Message-----

From: Michael Navarro [mailto:michael\_navarro@dot.ca.gov]  
Sent: Friday, October 05, 2007 1:39 PM  
To: [bross@co.fresno.ca.us](mailto:bross@co.fresno.ca.us); Arnaud Marjollet  
Subject: Bar 20 Dairy

We are currently reviewing two separate Producer Dairy applications forwarded from the San Joaquin Valley APCD and Fresno County Public Works and Planning with requests to comment. These cover two separate parcels,  
(1) NW corner of the Sonoma Avenue Alignment driveway at PM 32.760 and (2) SE corner at the same driveway. Having reviewed and compared both applications, clarification and additional information is needed to enable us to comment.

Project Description:

1. The APCD project information presents an expansion of the existing NW corner dairy with a total herd size of 6,204 animals to that of a herd size on both NW and SE corners of 19,120 animals. New shelter facilities are proposed on the SE corner. SR 180 AADT (2006) is estimated at 6,500 vehicles per day with 17 percent trucks. No employee data is given.

2. Although 130 trips are noted to be added to existing project traffic per page 2-46 -- compare with 110 trips per page 2-50 -- no information is given as to the extent and distribution of existing development -related traffic.

3. The Fresno County project information presents a project with "(N)o expansion of herd size . . ." of which there are 8,600 milk cows combined from both sites, but rather the addition of biogas capture and processing facilities on the SE corner site only and installation and operation of a six inch anaerobic flow through an HDPE transmission pipeline along the north side of SR 180 6 miles west to the Spreckels Sugar facilities at San Mateo Avenue. Traffic increases are described as an additional 12 incoming effluent truck loads from off-site to the SE corner site and an additional 6 employees.

Analysis:

4. A coordinated Operational Statement combining the overall plan for expansion of both dairy sites is needed. This OS should describe the existing and proposed number of employees for each site, the, paths, and extent of all modes of travel between the two sites, including the amounts during the AM and PM peak hour periods. Clarification of the proposed location of the pipeline, both across and along SR 180 is needed. The applicant would need to locate the proposed parallel line to SR 180 be set in its own easement outside of the future footprint of SR 180's ultimate configuration.

5. In 2006 the applicant requested a review of the safety of dairy employees at the Sonoma Avenue Alignment crossing of SR 180. The applicant's interest was that of a Left Turn Lane at the Sonoma Avenue Alignment driveway. In view of this, sufficient information is requested to enable Caltrans to determine whether installation of an appropriate employee crossing is needed.



Linda Adams  
Secretary for  
Environmental  
Protection

## California Regional Water Quality Control Board Central Valley Region



Arnold  
Schwarzenegger  
Governor

Fresno Office  
1685 E Street, Fresno, California 93706  
Phone (559) 445-5116 • FAX (559) 445-4910  
Internet Address: <http://www.waterboards.ca.gov/centralvalley/>

Received

OCT 15 2007

12 October 2007

Permits Srvc  
SJVAPCD

Mr. Arnaud Marjollet  
San Joaquin Valley Air Pollution Control District  
1990 East Gettysburg Avenue  
Fresno, CA 93726

### REVIEW OF PROPOSED MITIGATED NEGATIVE DECLARATION AND INITIAL STUDY, FOR THE EXPANDED PORTION OF BAR 20 DAIRY, FRESNO COUNTY, SCH #2007091073

On 19 September 2007, we received a copy of the *Proposed Mitigated Negative Declaration and Initial Study* report prepared by Quad Knopf for the expanded portion of the Bar 20 Dairy in Fresno County. The expanded portion of the dairy will house 6,800 milk cows, 1,000 dry cows and 5,710 head of support stock. The herd will generate liquid and solid wastes containing 181 tons of nitrogen and 540 tons of salt, annually. If not managed properly, dairy wastes can threaten surface water and groundwater resources. Regional Board staff has reviewed the Initial Study and Proposed Mitigated Negative Declaration for issues pertaining to water quality and compliance with Title 27 of the California Code of Regulations (Title 27), the Water Quality Control Plan for the Tulare Lake Basin, Second Edition, 1995 (Basin Plan) and the State Water Resources Board Resolution 68-16 (anti-degradation policy).

In the Initial Study, no findings of significant or potentially significant impacts to surface water or groundwater resources were made, and therefore no mitigation measures were proposed in the Proposed Mitigated Negative Declaration portion of the report. Listed below are our areas of concern.

1. Wastewater retention ponds at the original portion of the dairy (north of Whitesbridge Road) were constructed in 1972 in the absence of any engineering measures to protect water quality, and the wastewater retention ponds at the expanded portion of the dairy (south of Whitesbridge Road) were constructed in 2005 in compliance with the minimum soil texture requirements of Title 27. However, it is unknown whether any of the on-site ponds meet the performance standards set forth in the anti-degradation policy. This issue was not addressed in the Initial Study or the Proposed Mitigated Declaration. Recent studies indicate the minimum prescriptive requirements of §22562 (e) of Title 27 are unlikely to do so. To ensure the on-site wastewater retention ponds are not causing or contributing to a condition of pollution, an engineering evaluation should be performed to demonstrate that the original and expanded portions of the wastewater retention system are protective of the beneficial uses of underlying groundwater. Compliance with Resolution 68-16 requires that seepage from the ponds not cause or contribute to a condition of pollution or nuisance, and that resultant changes in water quality caused by seepage from the lagoon must be consistent with maximum benefit to the people of the State.

California Environmental Protection Agency



2. A groundwater monitoring network, consisting of three dedicated groundwater monitoring wells, was installed at the expanded portion of the dairy during its development in 2004. No part of the network provides groundwater data for the original portion of the dairy. This issue was not addressed in the Initial Study or the Proposed Mitigated Declaration. The dairyman should submit a plan for an expansion of the on-going groundwater monitoring program to include the installation of additional monitoring wells which would intercept first encountered groundwater downgradient of the associated cropland and the original portion of the dairy.
3. During exploratory soil boring activities in the vicinity of the wastewater retention ponds at the expanded portion of the dairy, groundwater was encountered 18 feet below site grade. The wastewater retention pond at that area of the site was excavated to a depth of 13 feet below site grade. Information submitted by the dairyman indicated a contingency plan to install a tile drain system in that area of the site in the event groundwater there rises to within five feet of the bottom of the nearby wastewater retention pond. This issue was not addressed in the Initial Study or the Proposed Mitigated Declaration. The dairyman should be required to provide details of this contingency plan.

If you have any questions regarding this matter, please call Steve Hulbert at (559) 444-2502.



STEVEN M. HULBERT  
Environmental Scientist



DAVID A. SHOLES  
Senior Engineering Geologist  
CEG No. 1687

cc: State Clearinghouse  
Quad Knopf, P. O. Box 3699, Visalia, CA 93278  
Steve Shehadey, Bar 20 Partners, LTD. P.O. Box 1231, Fresno, CA 93715

## **B. Responses to written comments**

This section restates each of the written comments received on the Mitigated Negative Declaration and Initial Study. Following each comment is a response intended to either supplement, clarify, or amend information provided in the Initial Study.

### **LETTER 1 – NATIVE AMERICAN HERITAGE COMMISSION** **Letter from Dave Singleton, Program Analyst**

**Comment 1:** *The Native American Heritage Commission is the state's Trustee Agency for Native American Cultural Resources. The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per CEQA guidelines §15064.5(b)(c). In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (ape);, and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following action:*

√ *Contact the appropriate California Historic Resources Information Center (CHRIS). Contact information for the Information Center nearest you is available for the State Office of Historic Preservation (816/653-7278/<http://www.ohp.psrks.ca.gov/1068/files/IC%20Roster.pdf>). The record search will determine:*

- *If a part or the entire APE has been previously surveyed for cultural resources.*
- *If any known cultural resources have already been recorded in or adjacent to the APE.*
- *If the probability is low, moderate, or high that cultural resources are located in the APE.*
- *If a survey is required to determine whether previously unrecorded cultural resources are present.*

√ *If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.*

- *The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.*
- *The final written report should be submitted within 3 month after work has been completed to the appropriate regional archaeological Information Center.*

√ *Contact the native American Heritage Commission (NAHC) for:*

- *A Sacred Lands File (SLF) search of the project area and information on tribal contacts in the project vicinity that may have additional cultural resource information. Please provide this office with the following citation format to assist with the Sacred Lands File search request USGS 7.5-minute quadrangle citation with the name, township, range and section.*
- *The NAHC advises the use of Native American Monitors to ensure proper identification and care given cultural resources that may be discovered. The NAHC recommends that contact be made with Native American Contacts on the attached list to get their input on potential project impact (APE). In some cases, the existence of a Native American cultural resources may be know only to a local tribe(s).*

- √ *Lack of surface evidence of archeological resources does not preclude their subsurface existence.*
- *Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5(f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.*
- *Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.*

**Response:** The project site has been farmed for many years, and the dairy facilities have been constructed without evidence of archaeological resources.

**Comment 2:**

- √ *Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigation plans.*
- *CEQA Guidelines, Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the initial Study identifies the presence of likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens.*
- √ *Health and Safety Code §Public Resources Code §5097.98 and Sec. §15064.5(d) of the CEQA Guidelines mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.*
- √ *Lead agencies should consider avoidance as defined in §15370 of the CEQA Guidelines when significant cultural resources are discovered during the course of project planning and implementation.*

**Response:** The dairy facilities have been constructed without any evidence of Native American Remains.

**LETTER 2 – CALIFORNIA DEPARTMENT OF TRANSPORTATION**

**Email from Michael Navarro**

**Comment 1** – *The APCE project information presents an expansion of the existing NW corner dairy with a total herd size of 6,204 animals to that of a herd size of both NW and SE corners of 19,120 animals. New shelter facilities are proposed on the SE corner. SR 180 AADT (2006) is estimated at 6,500 vehicles per day with 17 percent trucks. No employee data is given.*

**Response:** The dairy facility at the northwest corner of the Sonoma Avenue Alignment and SR 180 (referred to in the Initial Study as the existing dairy) has 40 employees.

**Comment 2** – *Although 130 trips are noted to be added to existing project traffic per page 2-46 – compare with 110 trips per page 2-50 - no information is given as to the extent and distribution of existing development-related traffic.*

**Response** – The 130 trips reported on page 2-46 represent 90 employee trips (45 employees) and 40 truck trips (20 trucks) associated with dairy facility at the southeast corner of Sonoma Avenue Alignment and SR 180 (referred to in the Initial Study as the “expanded dairy facility”). On page 2-50 the reported 110 trips is the net number of new trips on SR 180, reflecting a reduction in truck trips associated with current farming operations on 1,847 acres of cropland north of SR 180.

**Comment 3** – *The Fresno County project information presents a project with “No expansion of herd size...” of which there are 8,600 milk cows combined from both sites, but rather the addition of biogas capture and processing facilities on the SE corner site only and installation and operation of a six inch anaerobic flow through an HDPE transmission pipeline along the north side of SR 180 6 miles west to the Spreckels Sugar facilities at San Mateo Avenue. Traffic increases are described as an additional 12 incoming effluent truck loads from off-site to the SE corner site and an additional 6 employees.*

**Response:** The employee and truck numbers are correct. (see response to comment #4).

**Comment 4** – *A coordinated Operational Statement combining the overall plan for expansion of both dairy sites is needed. This OS should describe the existing and proposed number of employees for each site, the paths, and extent of all modes of travel between the two sites, including the amounts during the AM and PM peak hour periods. Clarification of the proposed location of the pipeline, both across and along SR 180 is needed. The applicant would need to located the proposed parallel line to SR 180 be set in its own easement outside of the future footprint of SR 180’s ultimate configuration.*

**Response:** Employees numbers for the two dairies (85) and the biogas operations (12) accounts for 194 trips. An additional 10 miscellaneous vehicle trips to the dairy sites brings the average daily vehicle trips to 204. It is estimated that 80% of these trips will use a route east on SR 180.

Milk Trucks (13) will generate 26 trips, all of which will be east on SR 180. Commodity trucks (15) will result in 30 average daily trips, with 80% to the east on SR 180.

Corn and wheat silage trucks (14) will make 28 average daily trips across SR 180 bringing feed south to the expanded dairy facility. Also manure will be trucked north from the dairy across SR 180, generating 2 trips per day.

The peak AM hour will be 6:30 AM to 7:30 AM with an estimated 50 trips. The 4:30 PM to 5:30 PM trips are expected to be 40 trips.

Finally, the applicant will comply with Caltrans requirements for the location of the referenced pipeline.

**LETTER 3 – CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**  
**Letter from Steven M. Hulbert and David A. Sholes.**

**Comment 1:** *In the Initial Study, no finding of significant or potentially significant impacts to surface water or groundwater resources were made, and therefore no mitigation measures were proposed in the Proposed Mitigated Negative Declaration portion of the report. Listed below are our areas of concern.*

*Wastewater retention ponds at the original portion of the dairy (north of Whitesbridge Road) were constructed in 1972 in the absence of any engineering measures to protect water quality, and the wastewater retention ponds at the expanded portion of the dairy (south of Whitesbridge Road) were constructed in 2005 in compliance with the minimum soil texture requirements of Title 27. However, it is unknown whether any of the on-site ponds meet the performance standards set forth in the anti-degradation policy. This issue was not addressed in the Initial Study or the Proposed Mitigation Declaration. Recent studies indicate the minimum prescriptive requirements of §22562 (e) of Title 27 are unlikely to do so. To ensure the on-site wastewater retention ponds are not causing or contributing to a condition of pollution, an engineering evaluation should be performed to demonstrate that the original and expanded portions of the wastewater retention system are protective of the beneficial use of underlying groundwater. Compliance with Resolution 68-16 requires that seepage from the ponds not cause or contribute to a condition of pollution or nuisance, and that resultant changes in water quality caused by seepage from the lagoon must be consistent with maximum benefit to the people of the State.*

**Response:** The following additional mitigation measure shall be undertaken prior to the issuance of revised waste discharge permit(s) by the Regional Water Quality Control Board:

The project applicant shall comply with all State Water Resources Board rules and regulations, including those requiring engineering evaluation of pond performance demonstrating protection of the beneficial uses of groundwater.

**Comment 2:** *A groundwater monitoring network, consisting of three dedicated groundwater monitoring wells, was installed at the expanded portion of the dairy during its development in 2004. No part of the network provides groundwater data for the original portion of the dairy. This issue was not addressed in the Initial Study or the Proposed Mitigated Declaration. The dairyman should submit a plan for an expansion of the on-going groundwater monitoring program to include the installation of additional monitoring wells which would intercept first encountered groundwater downgradient of the associated cropland and the original portion of the dairy.*

**Response:** The following additional mitigation measure shall be undertaken prior to the issuance of revised waste discharge permit(s) by the Regional Water Quality Control Board:

The project applicant shall submit to the Regional Water Quality Control Board a plan for an expansion of the on-going groundwater monitoring program which would intercept first

encountered groundwater downgradient of the associated cropland and the original portion of the dairy.

**Comment 3:** *During exploratory soil boring activities in the vicinity of the wastewater retention ponds at the expanded portion of the dairy, groundwater was encountered 18 feet below site grade. The wastewater retention pond at the area of the site was excavated to a depth of 13 feet below site grade. Information submitted by the dairyman indicated a contingency plan to install a tile drain system in that area of the site in the event groundwater there rises to within five feet of the bottom of the nearby wastewater retention pond. This issue was not addressed in the Initial Study or the Proposed Mitigated Declaration. The dairyman should be required to provide details of this contingency plan.*

**Response:** The following additional mitigation measure shall be undertaken prior to the issuance of revised waste discharge permit(s) by the Regional Water Quality Control Board:

The project applicant shall submit to the Regional Water Quality Control Board a contingency plan involving installation of a tile drainage system or other, alternative, measures to address groundwater in that area to within five feet of the bottom of the pond(s).