Revised Alternative Air Emissions

Summary of Air Pollutant Emissions from Agricultural and Dairy Operation Alternatives

Activity	Emissions (tons/year)							
	ROG	PM10[1]				Ammonia[2]		Methane
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 1	Scenario 2	
No Project								
Fugitive Dust								
Land Preparation	--	1,191	1,191	1,191	1,191	--	--	--
Windblown Dust	--	1,514	1,514	1,514	1,514	--	--	--
Cattle Movement at Unpaved Corral	--	5,165	10,400	769	1,548	--	--	--
Manure Decomposition	5,191	--	--	--	--	7,338	29,821	45,360
Cattle	--	--	--	--	--	--	--	71,000
TOTAL	**5,191**	**7,869**	**13,105**	**3,473**	**4,252**	**7,338**	**29,821**	**116,361**
Proposed Project								
Fugitive Dust								
Land Preparation	--	1,191	1,191	1,191	1,191	--	--	--
Windblown Dust	--	1,514	1,514	1,514	1,514	--	--	--
Cattle Movement at Unpaved Corral		3,808	6,897	567	1,026	--	--	--
Manure Decomposition	3,609	--	--	--	--	7,338	29,821	31,541
Cattle	--	--	--	--	--	--	--	71,000
TOTAL	**3,609**	**6,513**	**9,602**	**3,271**	**3,731**	**7,338**	**29,821**	**102,541**
10 Percent Herd Reduction								
Fugitive Dust								
Land Preparation	--	1,228	1,228	1,228	1,228	--	--	--
Windblown Dust	--	1,561	1,561	1,561	1,561	--	--	--
Cattle Movement at Unpaved Corral	--	3,373	6,377	502	949	--	--	--
Manure Decomposition	3,350	--	--	--	--	6,604	26,839	29,273
Cattle	--	--	--	--	--	--	--	63,900
TOTAL	**3,350**	**6,161**	**9,165**	**3,290**	**3,737**	**6,604**	**26,839**	**93,173**
50 Percent Herd Reduction								
Fugitive Dust								
Land Preparation	--	1,375	1,375	1,375	1,375	--	--	--
Windblown Dust	--	1,748	1,748	1,748	1,748	--	--	--
Cattle Movement at Unpaved Corral	--	2,196	4,297	327	639	--	--	--
Manure Decomposition	2,312	--	--	--	--	3,669	14,911	20,201
Cattle	--	--	--	--	--	--	--	35,500
TOTAL	**2,312**	**5,320**	**7,420**	**3,450**	**3,763**	**3,669**	**14,911**	**55,701**

[1] PM_{10} Scenarios are as follows:

Scenario 1: CARB PM_{10} Emission Factor; exclude all calves in PM_{10} emission estimate; and account for potential PM_{10} emission reduction during wet season;

Scenario 2: CARB PM_{10} Emission Factor; conservatively include all calves in PM_{10} emission estimate (assuming that PM_{10} emission rates for calves are equivalent to those for the heavier and larger dry cattle and heifers), and ignore potential PM_{10} emission

Scenario 3: Department of Agricultural Engineering at Texas A&M University Emission Factor; exclude all calves in PM10 emission estimate; account for potential PM_{10} emission reduction during wet season using approach consistent with Scenario 1;

Scenario 4: Department of Agricultural Engineering at Texas A&M University Emission Factor; conservatively include all calves in PM_{10} emission estimate; and ignore potential PM_{10} emission reduction during wet season.

[2] Ammonia Scenarios are as follows:

Scenario 1: 1994 Development and Selection of Ammonia Emission Factors, developed by Battye, et al. for the U.S. EPA

Scenario 2: Terry James, et al. Emission Factor

PM10 EMISSIONS FROM EXISTING AGRICULTURAL LAND PREPARATION

	Acreage Information							PM10 Emission		Acre-pass schedule														
Crop	Harvested Acres (1999) Countywide (ac)	fraction of total Harvested	Acreage Available (ac)	Allocated Existing Crop Acres	EF (lb/acre-pass)	Annual Acre-Pass/Acre	annual Acre Passes	PM10 Emissions (ton/year)	PM10 Emissions (ton/acre pass per acre)	Acre-pass schedule														total
a	b	c	d	e=cxd	f	g	h=gxe	I=fxh/2000	j=I/g	k	k	k	k	k	k	k	k	k	k	k	k	k
Alfalfa*	50,200	0.12	245,300	28,657	4.63	1.25	35,822	83	66	jan	oct	nov	dec											4
Alfalfa, seed	20,800	0.05	245,300	11,874	4.63	1.25	14,842	34	27	jan	oct	nov	dec											4
Hay, other	1,900	0.004	245,300	1,085	4.63	1.25	1,356	3	3	jan	oct	nov	dec											4
Barley	9,100	0.02	245,300	5,195	4.63	1	5,195	12	12	nov	dec													2
Corn (silage)	47,700	0.11	245,300	27,230	4.63	4	108,921	252	63	jan	mar	mar	nov	dec										5
Cotton (lint, all varieties)	199,000	0.46	245,300	113,602	4.63	4	454,407	1,051	263	feb	mar	nov	dec											4
Cotton (lseed, all varieties)	3,300	0.01	245,300	1,884	4.63	4	7,535	17	4	feb	mar	nov	dec											4
Pasture, fescue	11,000	0.03	245,300	6,279	4.63	0	0	0	0	--	--	--	--											0
Safflower	16,500	0.04	245,300	9,419	4.63	2	18,838	44	22	nov	dec													2
Sugar beets	5,000	0.01	245,300	2,854	4.63	5	14,272	33	7	jan	feb	mar	apr	may	jun	jul	aug	sept	oct	nov	dec			12
Wheat	62,000	0.14	245,300	35,394	4.63	1	35,394	82	82	nov	dec													2
Wheat, seed**	3,200	0.01	245,300	1,827	4.63	1	1,827	4	4	nov	dec													2
TOTAL																								

PM10 EMISSIONS FROM EXISTING AGRICULTURAL LAND PREPARATION

Crop	December & March Reduction				January & February Reduction				No Reduction			Equivalent PM10 Emissions (ton/year)
	Reduction Factor	# of months occuring in Dec & Mar	# acre passes in Dec &/or Mar	Dec & Mar Emissions (ton)	Reduction Factor	# of months occuring in Jand & Feb	# acre passes in Jan &/or Feb	Jan & Feb Emissions (ton)	Remaining months	# acre/passes in other months	Nonreduced emission (ton)	
a	l	m	n	o=jxlxn	p	q	r	s=jxpxr	t	u	v=kxu	w=o+s+v
Alfalfa*	0.75	1	0.31	16	0.50	1	0.31	10	2	0.63	41	**67**
Alfalfa, seed	0.75	1	0.31	6	0.50	1	0.31	4	2	0.63	17	**28**
Hay, other	0.75	1	0.31	1	0.50	1	0.31	0	2	0.63	2	**3**
Barley	0.75	1	0.50	5	0.50	0	0.00	0	1	0.50	6	**11**
Corn (silage)	0.75	3	2.40	113	0.50	1	0.80	25	1	0.80	50	**189**
Cotton (lint, all varieties)	0.75	2	2.00	394	0.50	1	1.00	131	1	1.00	263	**788**
Cotton (lseed, all varieties)	0.75	2	2.00	7	0.50	1	1.00	2	1	1.00	4	**13**
Pasture, fescue	0.75	0	0.00	0	0.50	0	0.00	0	0	0.00	0	**0**
Safflower	0.75	1	1.00	16	0.50	0	0.00	0	1	1.00	22	**38**
Sugar beets	0.75	2	0.83	4	0.50	2	0.83	3	8	3.33	22	**29**
Wheat	0.75	1	0.50	31	0.50	0	0.00	0	1	0.50	41	**72**
Wheat, seed**	0.75	1	0.50	2	0.50	0	0.00	0	1	0.50	2	**4**
TOTAL												**1,241**

Calculations based on CARB, Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
Methods for Assessing Area Source Emissions and guidance from CARB, Patrick Gaffney (8/16/99 personal communication with R. Del Rosario, BASELINE)
Data in column d based on Table 2, Summary of Crop Acre-Passes from EI.
Emission Factor assumes a s (silt content) = 22.7 %, according to CARB (8/30/99)
Existing cropland acreages based on site visit by BASELINE in July 1999.
b - Data from Section H of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element
c - Data from Section H of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element; ratio of crop to total crop harvested, excluding double crop acreage since total crops include double cropped acres.
d - Data from Section C of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element
f - Data from CARB Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
g - Data from CARB Section 7.4 (Table 2), Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
k - Data from crop calendars created by CARB (provided to R.Del Rosario on 8/16/99 by Patrick Gaffney of CARB).
l, p - Data from CARB Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III

* Assumes land preparation passes are similar to hay land preparation passes.
** Assumes land preparation passes are similar to wheat/barley land preparation passes.

PM10 EMISSIONS FROM EXISTING DAIRY OPERATIONS (CATTLE CORRAL DUST)

				Scenario 1 (CARB emission factor; include rain effects; ignore calves)								
Source	Existing	ratio	Head	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)
	a	b	c=axb	d	e=cxd	f=e/12	g	h=2xgxf	I	j=2xfxI	k=fx8	l=k+j+h
Milk cows	124,668											
Dry Cows & bred heifers	--	0.150	18,700	0.024528	459	38	0.5	38	0.75	57	306	401
Heifers (1 yr to breeding)	--	0.480	59,841	0.024528	1468	122	0.5	122	0.75	183	979	1284
Calves (3 mos. To 1 year)	--	0.400	49,867	0	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	9,973	0	0	0	0.5	0	0.75	0	0	0
Total			**138,382**									**1,686**

	Scenario 2 (CARB emission factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects; ignore calves)									Scenario 4 (USDA AAQTF Emission Factor; ignore rainfall; include calves)	
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)
	m	n=mxc	o	p=oxc	q=p/12	r	s=rx2xq	t	u=2xtxq	v=8xq	w=v+u+s	x	y=xxc
Milk cows													
Dry Cows & bred heifers	0.02453	459	0.00365	68	6	0.5	6	0.75	9	46	60	0.00365	68
Heifers (1 yr to breeding)	0.02453	1,468	0.00365	218	18	0.5	18	0.75	27	146	191	0.00365	218
Calves (3 mos. To 1 year)	0.02453	1,223	0	0	0	0.0	0	0.75	0	0	0	0.00365	182
Baby Calves (<3 months)	0.02453	245	0	0	0	0.0	0	0.75	0	0	0	0.00365	36
Total		**3,394**									**251**		**505**

Notes:

a Total milk cows in Kings County, based on Table No. 5 (Theoretical Dairy Capacity of Kings County)

b Ratio of milk cow to support stock for total cattle capacity in Kings County, as provided in Table No. 5(Theoretical Dairy Capacity of Kings County)

c Table No. 5 did not provide data for support stock.

d PM10 Emission factor obtained from CARB's Section 7.6 (Cattle Feedlot Dust), March 1989, Emission Inventory Procedural Manual and from USEPA AP42 4th edition; Emission factor assumes a PM10 percent of 48%, based on CARB's Section 7.6. PM10EF = (280lb/1000head-day) x (0.48 PM10) x (365 day/yr) / (2000 lb/ton) = 0.024528 tons/head-year. The emission factor used is for beef cattle in cattle feedlots since PM10 emission factors for support stock at dairy facilities are not available.

g, l According to CARB (personal communication between Mr. Patrick Gaffney), CARB and Ms. Rhodora Del Rosario, BASELINE, on 8/30/99, CARB has not published data that identifies the rainfall volume that would reduce reduce PM10 emissions from feedlot corrals. Based on the lack of data, CARB suggested that published PM10 reductions applied for land preparation be used for feedlot calculations.

o PM10 Emission factor obtained from Confined Livestock Air Quality Committee of the USDA Agricultural Air Quality Committee of the USDA Agricultural Air Quality Task Force, Air Quality Research & Technology Transfer Programs for Concentrated Animal Feeding Operations Air Quality Research and Technoloy Transfer White Paper and Recommendations for Concentrated Animal Feeding Operations, Adopted by USDA Agricultural Air Quality Task Force, Washington D.C., July 19, 2000; emission factor reflects non-annualized value since rainfall effects in Texas would different compared to California.

PM10 EMISSIONS FROM FUTURE AGRICULTURAL LAND PREPARATION 10% HERD REDUCTION

	Acreage Information							PM10 Emission		Acre-pass schedule														
Crop	Future Crops	fraction of total future crops	Acreage Available (ac)	Allocated Existing Crop Acres	EF (lb/acre-pass)	Annual Acre-Pass/Acre	annual Acre Passes	PM10 Emissions (ton/year)	PM10 Emissions (ton/acre pass per acre)	Acre-pass schedule														total
a	b	c	d	e	f	g	h=gxe	I=fxh/2000	j=I/g	k	k	k	k	k	k	k	k	k	k	k	k	k
Alfalfa*	42,060	0.12	242,770	28,362	4.63	1.25	35,452	82	66	jan	oct	nov	dec											4
Alfalfa, seed	17,427	0.05	242,770	11,751	4.63	1.25	14,689	34	27	jan	oct	nov	dec											4
Hay, other	1,592	0.004	242,770	1,074	4.63	1.25	1,342	3	2	jan	oct	nov	dec											4
Barley	7,624	0.02	242,770	5,141	4.63	1	5,141	12	12	nov	dec													2
Corn (silage)	39,965	0.11	242,770	26,949	4.63	4	107,796	249	62	jan	mar	mar	nov	dec										5
Cotton (lint, all varieties)	166,732	0.46	242,770	112,430	4.63	4	449,720	1,040	260	feb	mar	nov	dec											4
Cotton (lseed, all varieties)	2,765	0.01	242,770	1,864	4.63	4	7,458	17	4	feb	mar	nov	dec											4
Pasture, fescue	9,216	0.03	242,770	6,214	4.63	0	0	0	0	--	--	--	--											0
Safflower	13,825	0.04	242,770	9,322	4.63	2	18,645	43	22	nov	dec													2
Sugar beets	4,189	0.01	242,770	2,825	4.63	5	14,124	33	7	jan	feb	mar	apr	may	jun	jul	aug	sept	oct	nov	dec			12
Wheat	51,947	0.14	242,770	35,029	4.63	1	35,029	81	81	nov	dec													2
Wheat, seed**	2,681	0.01	242,770	1,808	4.63	1	1,808	4	4	nov	dec													2
TOTAL																								

50 % HERD REDUCTION

	Acreage Information							PM10 Emission		Acre-pass schedule														
Crop	Future Crops	fraction of total future crops	Acreage Available (ac)	Allocated Existing Crop Acres	EF (lb/acre-pass)	Annual Acre-Pass/Acre	annual Acre Passes	PM10 Emissions (ton/year)	PM10 Emissions (ton/acre pass per acre)	Acre-pass schedule														total
a	b	c	d	e	f	g	h=gxe	I=fxh/2000	j=I/g	k	k	k	k	k	k	k	k	k	k	k	k	k
Alfalfa*	42,060	0.12	271,918	31,767	4.63	1.25	39,709	92	73	jan	oct	nov	dec											4
Alfalfa, seed	17,427	0.05	271,918	13,162	4.63	1.25	16,453	38	30	jan	oct	nov	dec											4
Hay, other	1,592	0.004	271,918	1,202	4.63	1.25	1,503	3	3	jan	oct	nov	dec											4
Barley	7,624	0.02	271,918	5,758	4.63	1	5,758	13	13	nov	dec													2
Corn (silage)	39,965	0.11	271,918	30,185	4.63	4	120,738	279	70	jan	mar	mar	nov	dec										5
Cotton (lint, all varieties)	166,732	0.46	271,918	125,929	4.63	4	503,715	1,165	291	feb	mar	nov	dec											4
Cotton (lseed, all varieties)	2,765	0.01	271,918	2,088	4.63	4	8,353	19	5	feb	mar	nov	dec											4
Pasture, fescue	9,216	0.03	271,918	6,961	4.63	0	0	0	0	--	--	--	--											0
Safflower	13,825	0.04	271,918	10,442	4.63	2	20,883	48	24	nov	dec													2
Sugar beets	4,189	0.01	271,918	3,164	4.63	5	15,819	37	7	jan	feb	mar	apr	may	jun	jul	aug	sept	oct	nov	dec			12
Wheat	51,947	0.14	271,918	39,234	4.63	1	39,234	91	91	nov	dec													2
Wheat, seed**	2,681	0.01	271,918	2,025	4.63	1	2,025	5	5	nov	dec													2
TOTAL																								

PM10 EMISSIONS FROM FUTURE AGRICULTURAL LAND PREPARATION 10% HERD REDUCTION

Crop	December & March Reduction				January & February Reduction				No Reduction			Equivalent
	Reduction Factor	# of months occuring in Dec & Mar	# acre passes in Dec &/or Mar	Dec & Mar Emissions (ton)	Reduction Factor	# of months occuring in Jan & Feb	# acre passes in Jan &/or Feb	Jan & Feb Emissions (ton)	Remaining months	# acre/passes in other months	Nonreduced emission (ton)	**PM10 Emissions (ton/year)**
a	l	m	n	o=ixlxn	p	q	r	s=ixpxr	t	u	v=ixt	**w=o+s+v**
Alfalfa*	0.75	1	0.31	15	0.50	1	0.31	10	2	0.63	41	**67**
Alfalfa, seed	0.75	1	0.31	6	0.50	1	0.31	4	2	0.63	17	**28**
Hay, other	0.75	1	0.31	1	0.50	1	0.31	0	2	0.63	2	**3**
Barley	0.75	1	0.50	4	0.50	0	0.00	0	1	0.50	6	**10**
Corn (silage)	0.75	3	2.40	112	0.50	1	0.80	25	1	0.80	50	**187**
Cotton (lint, all varieties)	0.75	2	2.00	390	0.50	1	1.00	130	1	1.00	260	**780**
Cotton (lseed, all varieties)	0.75	2	2.00	6	0.50	1	1.00	2	1	1.00	4	**13**
Pasture, fescue	0.75	0	0.00	0	0.50	0	0.00	0	0	0.00	0	**0**
Safflower	0.75	1	1.00	16	0.50	0	0.00	0	1	1.00	22	**38**
Sugar beets	0.75	2	0.83	4	0.50	2	0.83	3	8	3.33	22	**29**
Wheat	0.75	1	0.50	30	0.50	0	0.00	0	1	0.50	41	**71**
Wheat, seed**	0.75	1	0.50	2	0.50	0	0.00	0	1	0.50	2	**4**
TOTAL												**1,228**

50 % HERD RED

Crop	December & March Reduction				January & February Reduction				No Reduction			Equivalent
	Reduction Factor	# of months occuring in Dec & Mar	# acre passes in Dec &/or Mar	Dec & Mar Emissions (ton)	Reduction Factor	# of months occuring in Jan & Feb	# acre passes in Jan &/or Feb	Jan & Feb Emissions (ton)	Remaining months	# acre/passes in other months	Nonreduced emission (ton)	**PM10 Emissions (ton/year)**
a	l	m	n	o=ixlxn	p	q	r	s=ixpxr	t	u	v=ixt	**w=o+s+v**
Alfalfa*	0.75	1	0.31	17	0.50	1	0.31	11	2	0.63	46	**75**
Alfalfa, seed	0.75	1	0.31	7	0.50	1	0.31	5	2	0.63	19	**31**
Hay, other	0.75	1	0.31	1	0.50	1	0.31	0	2	0.63	2	**3**
Barley	0.75	1	0.50	5	0.50	0	0.00	0	1	0.50	7	**12**
Corn (silage)	0.75	3	2.40	126	0.50	1	0.80	28	1	0.80	56	**209**
Cotton (lint, all varieties)	0.75	2	2.00	437	0.50	1	1.00	146	1	1.00	291	**874**
Cotton (lseed, all varieties)	0.75	2	2.00	7	0.50	1	1.00	2	1	1.00	5	**14**
Pasture, fescue	0.75	0	0.00	0	0.50	0	0.00	0	0	0.00	0	**0**
Safflower	0.75	1	1.00	18	0.50	0	0.00	0	1	1.00	24	**42**
Sugar beets	0.75	2	0.83	5	0.50	2	0.83	3	8	3.33	24	**32**
Wheat	0.75	1	0.50	34	0.50	0	0.00	0	1	0.50	45	**79**
Wheat, seed**	0.75	1	0.50	2	0.50	0	0.00	0	1	0.50	2	**4**
TOTAL												**1,375**

Calculations based on CARB, Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
Methods for Assessing Area Source Emissions and guidance from CARB, Patrick Gaffney (8/16/99 personal communication with R. Del Rosario, BASELINE)
Data in column d based on Table 2, Summary of Crop Acre-Passes from EI.
Emission Factor assumes a s (silt content) = 22.7 %, according to CARB (8/30/99)
Existing cropland acreages based on site visit by BASELINE in July 1999.
b - Data from Section H of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element
c - Data from Section H of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element; ratio of crop to total crop harvested, excluding double crop acreage since total crops include double cropped acres.
f - Data from CARB Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
g - Data from CARB Section 7.4 (Table 2), Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
k - Data from crop calendars created by CARB (provided to R.Del Rosario on 8/16/99 by Patrick Gaffney of CARB).
l, p - Data from CARB Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III

* Assumes land preparation passes are similar to hay land preparation passes.

PM10 EMISSIONS FROM WINDBLOWN DUST

Case	Area (ac)	PM10 EF (ton/ac/yr)	PM10 Emission (tons/yr)
Existing Croplands	245,300	0.006428	1,577
Future Croplands	235,483	0.006428	1,514
10% Herd Reduction	242,770	0.006428	1,561
50 % Herd Reduction	271,918	0.006428	1,748

PM10 EF = PM10 emission factor for nonpasture agricultural lands in Kings County, San Joaquin Valley Air Basin; emission factor obtained from Section 7.12 (Windblown Dust - Agricultural Lands), Updated August 1997, Emission Inventory Procedural Manual, Vol III
PM10EF = 0.5 * 0.012856; 0.5 reflects % of PM that is PM10
Acreage assumes 26.21 cows per dairy acre (per Table No. 5).

Added cropland from herd reduction

type	ratio	cows/acre	acres/cow	Total Future Capacity	10% reduced herd size	Added Cropland from 10% Reduced Herd Size	50% reduced herd size	Added Cropland from 10% Reduced Herd Size
milk cow	1	26	0.04	381,980	343,782	1,457	190,990	7,287
Dry Cows & bred heifers	0.150	4	0.25	57,297	51,567	1,457	28,649	7,287
Heifers (1 yr to breeding)	0.480	13	0.08	183,351	165,016	1,457	91,676	7,287
Calves (3 mos. To 1 year)	0.400	10	0.10	152,792	137,513	1,457	76,396	7,287
Baby Calves (<3 months)	0.080	2	0.48	30,558	27,502	1,457	15,279	7,287
Total			0.94	805,978	725,380	7,287	402,989	36,435

PM10 EMISSIONS: 10 % HERD REDUCTION; DAIRY OPERATIONS (CATTLE CORRAL DUST)

	Head Capacity						Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Existing	Support stock to milk cow ratio	Existing Head	Total Head Capacity	Future New Head Capacity	10% reduced herd size	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
	a	b	c=a x b	d	e=d-c	e1=dx0.9	f	g=fxe1	h=g/12	I	j=2xixh	k	l=2xkxh	m=hx8	n=m+l +j
Milk Cow	124,668														
Dry Cows & bred heifers	--	0.150	18,700	57,297	38,597	51,567	0.02453	1,265	105	0.5	105	0.75	158	843	1,107
Heifers (1 yr to breeding)	--	0.480	59,841	183,351	123,510	165,016	0.02453	4,048	337	0.5	337	0.75	506	2,698	3,542
Calves (3 mos. To 1 year)	--	0.400	49,867	152,792	102,925	137,513	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	9,973	30,558	20,585	27,502	0.00000	0	0	0.5	0	0.75	0	0	0
Total															**4,648**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
	o	p=oxe1	q	r=qx365/(2000x1000)	s=rxe1	t=s/12	u	v=2xtxu	w	x=2xwxt	y=tx8	z=y+x+v	aa	ab=aax365/(2000x1000)	ac=abxe1
Milk cows															
Dry Cows & bred heifers	0.02453	1,265	20	0.00365	188	16	0.5	16	0.75	24	125	165	20	0.00365	188
Heifers (1 yr to breeding)	0.02453	4,048	20	0.00365	602	50	0.5	50	0.75	75	402	527	20	0.00365	602
Calves (3 mos. To 1 year)	0.02453	3,373	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	502
Baby Calves (<3 months)	0.02453	675	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	100
Total		**9,360**										**692**			**1,393**

PM10 EMISSIONS: 50 % HERD REDUCTION; DAIRY OPERATIONS (CATTLE CORRAL DUST)

	Head Capacity						Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Existing	Support stock to milk cow ratio	Existing Head	Total Head Capacity	Future Head Capacity	50% reduced herd size	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
	a	b	c=a x b	d	e=d-c	e1=dx0.5	f	g=fxe1	h=g/12	l	j=2xixh	k	l=2xkxh	m=hx8	n=m+l +j
Milk Cow	124,668														
Dry Cows & bred heifers	--	0.150	18,700	57,297	38,597	28,649	0.02453	703	59	0.5	59	0.75	88	468	615
Heifers (1 yr to breeding)	--	0.480	59,841	183,351	123,510	91,676	0.02453	2,249	187	0.5	187	0.75	281	1,499	1,968
Calves (3 mos. To 1 year)	--	0.400	49,867	152,792	102,925	76,396	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	9,973	30,558	20,585	15,279	0.00000	0	0	0.5	0	0.75	0	0	0
Total															**2,582**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
	o	p=oxe1	q	r=qx365/(2000x1000)	s=rxe1	t=s/12	u	v=2xtxu	w	x=2xwxt	y=tx8	z=y+x+v	aa	ab=aax365/(2000x1000)	ac=abxe1
Milk cows															
Dry Cows & bred heifers	0.02453	703	20	0.00365	105	9	0.5	9	0.75	13	70	91	20	0.00365	105
Heifers (1 yr to breeding)	0.02453	2,249	20	0.00365	335	28	0.5	28	0.75	42	223	293	20	0.00365	335
Calves (3 mos. To 1 year)	0.02453	1,874	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	279
Baby Calves (<3 months)	0.02453	375	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	56
Total		**5,200**										**384**			**774**

Notes:

f PM10 Emission factor obtained from CARB's Section 7.6 (Cattle Feedlot Dust), March 1989, Emission Inventory Procedural Manual and from USEPA AP42 4th edition; Emission factor assumes a PM10 percent of 48%, based on CARB's Section 7.6. PM10EF = (280lb/1000head-day) x (0.48 PM10) x (365 day/yr) / (2000 lb/ton) = 0.024528 tons/head-year. The emission factor used is for beef cattle in cattle feedlots since PM10 emission factors for support stock at dairy facilities are not available.

i, k According to CARB (personal communication between Mr. Patrick Gaffney), CARB and Ms. Rhodora Del Rosario, BASELINE, on 8/30/99, CARB has not published data that identifies the rainfall volume that would reduce reduce PM10 emissions from feedlot corrals. Based on the lack of data, CARB suggested that published PM10 reductions applied for land preparation be used for feedlot calculations.

q PM10 Emission factor obtained from Confined Livestock Air Quality Committee of the USDA Agricultural Air Quality Committee of the USDA Agricultural Air Quality Task Force, Air Quality Research & Technology Transfer Programs for Concentrated Animal Feeding Operations Air Quality Research and Technoloy Transfer White Paper and Recommendations for Concentrated Animal Feeding Operations, Adopted by USDA Agricultural Air Quality Task Force, Washington D.C., July 19, 2000; emission factor reflects non-annualized value since rainfall effects in Texas would different compared to California.

ROG EMISSIONS FROM EXISTING DAIIRES AND LIMITED EXPANDED DAIRIES

	Existing Conditions[1]									Total Expansion Limit								
Dairy	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Expan-sion Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)
Maximum Limit	*705*	*106*	*338*	*282*	*56*	*1,488*	*19,160*	*9.58*	*no*	--	--	--	--	--	--	--	--	--
1	81	12	39	*32*	*6*	171	2,201	1	no	624	94	300	250	50	1,317	16,958	8	no
2	98	15	47	*39*	*8*	207	2,663	1	no	607	91	291	243	49	1,281	16,496	8	no
3	110	17	53	*44*	*9*	232	2,989	1	no	595	89	286	238	48	1,255	16,170	8	no
4	118	18	56	*47*	*9*	248	3,197	2	no	587	88	282	235	47	1,239	15,962	8	no
5	118	18	56	*47*	*9*	248	3,197	2	no	587	88	282	235	47	1,239	15,962	8	no
6	133	20	64	*53*	*11*	281	3,615	2	no	572	86	275	229	46	1,207	15,545	8	no
7	164	25	79	*66*	*13*	346	4,457	2	no	541	81	260	216	43	1,142	14,703	7	no
8	166	25	80	*66*	*13*	350	4,511	2	no	539	81	259	216	43	1,137	14,648	7	no
9	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
10	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
11	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
12	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
13	183	27	88	*73*	*15*	386	4,973	2	no	522	78	251	209	42	1,101	14,186	7	no
14	200	30	96	*80*	*16*	422	5,435	3	no	505	76	242	202	40	1,066	13,724	7	no
15	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
16	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
17	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
18	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
19	236	35	113	*94*	*19*	498	6,414	3	no	469	70	225	188	38	990	12,746	6	no
20	259	39	124	*104*	*21*	546	7,034	4	no	446	67	214	178	36	941	12,126	6	no
21	294	44	141	*118*	*24*	621	7,993	4	no	411	62	197	164	33	867	11,167	6	no
22	298	45	143	*119*	*24*	629	8,099	4	no	407	61	195	163	33	859	11,061	6	no
23	318	48	153	*127*	*25*	671	8,642	4	no	387	58	186	155	31	817	10,517	5	no
24	324	49	155	*129*	*26*	683	8,793	4	no	381	57	183	153	31	805	10,367	5	no
25	326	49	156	*130*	*26*	688	8,860	4	no	379	57	182	152	30	800	10,300	5	no
26	334	50	160	*134*	*27*	705	9,077	5	no	371	56	178	148	30	783	10,083	5	no
27	340	51	163	*136*	*27*	717	9,240	5	no	365	55	175	146	29	770	9,920	5	no
28	341	51	164	*136*	*27*	720	9,272	5	no	364	55	175	146	29	768	9,888	5	no
29	352	53	169	*141*	*28*	743	9,566	5	no	353	53	169	141	28	745	9,593	5	no
30	353	53	169	*141*	*28*	745	9,592	5	no	352	53	169	141	28	743	9,568	5	no
31	353	53	169	*141*	*28*	745	9,592	5	no	352	53	169	141	28	743	9,568	5	no
32	353	53	169	*141*	*28*	745	9,592	5	no	352	53	169	141	28	743	9,568	5	no
33	363	54	174	*145*	*29*	766	9,865	5	no	342	51	164	137	27	722	9,295	5	no
34	376	56	181	*151*	*30*	794	10,231	5	no	329	49	158	131	26	693	8,928	4	no
35	376	56	181	*151*	*30*	794	10,231	5	no	329	49	158	131	26	693	8,928	4	no
36	388	58	186	*155*	*31*	819	10,545	5	no	317	48	152	127	25	669	8,615	4	no
37	388	58	186	*155*	*31*	819	10,551	5	no	317	48	152	127	25	668	8,609	4	no
38	389	58	187	*156*	*31*	821	10,572	5	no	316	47	152	126	25	667	8,588	4	no
39	400	60	192	*160*	*32*	844	10,871	5	no	305	46	146	122	24	644	8,289	4	no
40	408	61	196	*163*	*33*	861	11,088	6	no	297	45	143	119	24	627	8,072	4	no
41	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
42	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
43	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
44	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
45	427	64	205	*171*	*34*	901	11,605	6	no	278	42	133	111	22	587	7,555	4	no
46	441	66	212	*176*	*35*	931	11,985	6	no	264	40	127	106	21	557	7,175	4	no
47	449	67	216	*180*	*36*	947	12,202	6	no	256	38	123	102	20	540	6,957	3	no
48	457	69	219	*183*	*37*	964	12,420	6	no	248	37	119	99	20	523	6,740	3	no
49	459	69	220	*184*	*37*	968	12,474	6	no	246	37	118	98	20	519	6,686	3	no
50	465	70	223	*186*	*37*	981	12,637	6	no	240	36	115	96	19	506	6,522	3	no
51	471	71	226	*188*	*38*	993	12,789	6	no	234	35	113	94	19	495	6,371	3	no
52	471	71	226	*188*	*38*	993	12,789	6	no	234	35	113	94	19	495	6,371	3	no
53	483	72	232	*193*	*39*	1,019	13,126	7	no	222	33	107	89	18	468	6,033	3	no

ROG EMISSIONS FROM EXISTING DAIIRES AND LIMITED EXPANDED DAIRIES

	Existing Conditions[1]									Total Expansion Limit								
Dairy	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Expan-sion Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)
54	486	73	233	*194*	*39*	1,025	13,208	7	no	219	33	105	88	18	462	5,952	3	no
55	496	74	238	*198*	*40*	1,047	13,480	7	no	209	31	100	84	17	441	5,680	3	no
56	497	75	239	*199*	*40*	1,049	13,507	7	no	208	31	100	83	17	439	5,653	3	no
57	503	75	241	*201*	*40*	1,061	13,670	7	no	202	30	97	81	16	426	5,490	3	no
58	517	78	248	*207*	*41*	1,091	14,050	7	no	188	28	90	75	15	397	5,109	3	no
59	518	78	249	*207*	*41*	1,093	14,078	7	no	187	28	90	75	15	395	5,082	3	no
60	531	80	255	*212*	*42*	1,120	14,431	7	no	174	26	84	70	14	367	4,729	2	no
61	547	82	263	*219*	*44*	1,154	14,866	7	no	158	24	76	63	13	333	4,294	2	no
62	550	83	264	*220*	*44*	1,161	14,947	7	no	155	23	74	62	12	327	4,212	2	no
63	553	83	265	*221*	*44*	1,167	15,029	8	no	152	23	73	61	12	321	4,131	2	no
64	559	84	268	*224*	*45*	1,179	15,187	8	no	146	22	70	58	12	308	3,973	2	no
65	562	84	270	*225*	*45*	1,186	15,273	8	no	143	21	69	57	11	302	3,886	2	no
66	565	85	271	*226*	*45*	1,192	15,355	8	no	140	21	67	56	11	295	3,805	2	no
67	571	86	274	*228*	*46*	1,205	15,518	8	no	134	20	64	54	11	283	3,642	2	no
68	579	87	278	*232*	*46*	1,222	15,735	8	no	126	19	60	50	10	266	3,424	2	no
69	588	88	282	*235*	*47*	1,241	15,986	8	no	117	18	56	47	9	246	3,173	2	no
70	588	88	282	*235*	*47*	1,241	15,986	8	no	117	18	56	47	9	246	3,173	2	no
71	595	89	286	*238*	*48*	1,255	16,170	8	no	110	17	53	44	9	232	2,989	1	no
72	600	90	288	*240*	*48*	1,266	16,306	8	no	105	16	50	42	8	222	2,854	1	no
73	601	90	288	*240*	*48*	1,268	16,333	8	no	104	16	50	42	8	219	2,826	1	no
74	632	95	303	*253*	*51*	1,334	17,176	9	no	73	11	35	29	6	154	1,984	1	no
75	637	96	306	*255*	*51*	1,344	17,312	9	no	68	10	33	27	5	143	1,848	1	no
76	642	96	308	*257*	*51*	1,355	17,448	9	no	63	9	30	25	5	133	1,712	1	no
77	645	97	310	*258*	*52*	1,361	17,529	9	no	60	9	29	24	5	127	1,631	1	no
78	650	98	312	*260*	*52*	1,372	17,665	9	no	55	8	26	22	4	116	1,495	1	no
79	651	98	312	*260*	*52*	1,374	17,692	9	no	54	8	26	22	4	114	1,468	1	no
80	676	101	325	*271*	*54*	1,427	18,384	9	no	29	4	14	11	2	60	775	0	no
81	680	102	326	*272*	*54*	1,435	18,480	9	no	25	4	12	10	2	53	679	0	no
82	689	103	331	*276*	*55*	1,454	18,725	9	no	16	2	8	6	1	34	435	0	no
83	696	104	334	*278*	*56*	1,469	18,915	9	no	9	1	4	4	1	19	245	0	no
84	700	105	336	*280*	*56*	1,477	19,024	10	no	5	1	2	2	0	11	136	0	no
85	706	106	339	*282*	*56*	1,490	19,187	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
86	715	107	343	*286*	*57*	1,509	19,432	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
87	737	111	354	*295*	*59*	1,555	20,029	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
88	749	112	360	*300*	*60*	1,580	20,356	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
89	752	113	361	*301*	*60*	1,587	20,437	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
90	765	115	367	*306*	*61*	1,614	20,782	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
91	800	120	384	*320*	*64*	1,688	21,742	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
92	801	120	384	*320*	*64*	1,690	21,769	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
93	803	120	385	*321*	*64*	1,694	21,823	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
94	811	122	389	*324*	*65*	1,711	22,041	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
95	820	123	394	*328*	*66*	1,730	22,285	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
96	824	124	395	*329*	*66*	1,738	22,381	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
97	824	124	395	*329*	*66*	1,738	22,381	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
98	824	124	395	*329*	*66*	1,738	22,381	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
99	830	125	398	*332*	*66*	1,751	22,557	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
100	833	125	400	*333*	*67*	1,758	22,638	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
101	869	130	417	*348*	*70*	1,834	23,617	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
102	882	132	424	*353*	*71*	1,862	23,980	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
103	882	132	424	*353*	*71*	1,862	23,980	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
104	882	132	424	*353*	*71*	1,862	23,980	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
105	885	133	425	*354*	*71*	1,867	24,052	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
106	931	140	447	*372*	*74*	1,964	25,302	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
107	968	145	465	*387*	*77*	2,042	26,307	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
108	979	147	470	*392*	*78*	2,066	26,606	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes

ROG EMISSIONS FROM EXISTING DAIIRES AND LIMITED EXPANDED DAIRIES

	Existing Conditions[1]									Total Expansion Limit								
Dairy	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Expan-sion Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)
109	985	148	473	*394*	*79*	2,078	26,769	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
110	989	148	475	*396*	*79*	2,087	26,878	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
111	1,000	150	480	*400*	*80*	2,110	27,177	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
112	1,000	150	480	*400*	*80*	2,110	27,177	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
113	1,023	153	491	*409*	*82*	2,159	27,802	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
114	1,026	154	492	*410*	*82*	2,165	27,884	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
115	1,027	154	493	*411*	*82*	2,167	27,911	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
116	1,028	154	493	*411*	*82*	2,169	27,938	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
117	1,029	154	494	*412*	*82*	2,171	27,965	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
118	1,103	165	529	*441*	*88*	2,327	29,976	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
119	1,117	168	536	*447*	*89*	2,357	30,357	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
120	1,118	168	536	*447*	*89*	2,358	30,374	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
121	1,140	171	547	*456*	*91*	2,405	30,982	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
122	1,149	172	552	*460*	*92*	2,424	31,226	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
123	1,154	173	554	*462*	*92*	2,435	31,362	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
124	1,157	174	555	*463*	*93*	2,441	31,444	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
125	1,176	176	565	*471*	*94*	2,482	31,973	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
126	1,190	179	571	*476*	*95*	2,511	32,341	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
127	1,200	180	576	*480*	*96*	2,532	32,612	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
128	1,232	185	591	*493*	*99*	2,600	33,482	17	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
129	1,235	185	593	*494*	*99*	2,606	33,572	17	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
130	1,253	188	601	*501*	*100*	2,644	34,053	17	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
131	1,319	198	633	*528*	*106*	2,783	35,846	18	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
132	1,353	203	649	*541*	*108*	2,855	36,769	18	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
133	1,371	206	658	*548*	*110*	2,893	37,260	19	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
134	1,400	210	672	*560*	*112*	2,954	38,048	19	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
135	1,640	246	787	*656*	*131*	3,460	44,570	22	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
136	1,641	246	788	*656*	*131*	3,463	44,597	22	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
137	1,830	275	878	*732*	*146*	3,861	49,734	25	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
138	1,859	279	892	*744*	*149*	3,922	50,522	25	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
139	1,879	282	902	*752*	*150*	3,965	51,066	26	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
140	1,925	289	924	*770*	*154*	4,062	52,316	26	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
141	2,154	323	1,034	*862*	*172*	4,545	58,539	29	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
142	2,463	369	1,182	*985*	*197*	5,197	66,937	33	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
143	2,545	382	1,222	*1,018*	*204*	5,370	69,165	35	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
144	2,594	389	1,245	*1,038*	*208*	5,473	70,497	35	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
145	2,600	390	1,248	*1,040*	*208*	5,486	70,660	35	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
146	2,932	440	1,407	*1,173*	*235*	6,187	79,683	40	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
147	4,430	665	2,126	*1,772*	*354*	9,347	120,394	60	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
148	4,889	733	2,347	*1,956*	*391*	10,316	132,868	66	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
149	4,980	747	2,390	*1,992*	*398*	10,508	135,341	68	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
TOTAL	**124,668**	**18,700**	**59,841**	**49,867**	**9,973**	**263,049**	**3,388,091**	**1,694**		**24,559**	**3,684**	**11,788**	**9,824**	**1,965**	**51,820**		**334**	

[1] Herd size based on year 2000 milk cows in Kings County, obtained from Carol Collar, Farm Advisor U.C, Cooperative

Extension. Support stock based on ratio of milk cows to support stock, as identified in Table 5 of the Dairy Element.

Future Capacity PM10 Emissions from Corrals

Assumes All New Future and Expanded Dairies Subject to Dairy Element 50% Reduction Control Measure
10% Reduced Herd Size

	Uncontrolled Emissions					50% Controlled Emission Reduction from Future New and Expanded Dairies							Controlled Future Conditions	
Animal Type	Existing Head	Future 10% Reduced Total Head Capacity	Emissons from Existing Head (tons/year)	Emissons from 10% Reduced Total Head Capacity (tons/year)	Net Increase in Emissons under Future Conditions (tons per year)	Emissions from Future Expanded and New Dairies (tons/year)	Emissions from Future Expanded and New Dairies (tons/month)	Zero % reduction in Jan and Feb (tons/2months)	25% further reduction in Dec. & Mar. (tons/2 months)	50% reduction from Apr through Nov (tons/8 months)	50% reduction year round (tons/year)	Total Controlled Emission Reduction (tons/year)	Total Future Conditions (tons/year)	Total Net Emission Increase under Future Conditions (tons/year)
Scenario 1														
Milk cows	124,668	343,782	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	51,567	401	1,107	705	705	59	118	78.42	206	NA	402	803	402
Heifers (1 yr to breeding)	59,841	165,016	1,284	3,542	2,257	2,257	188	376	250.93	658	NA	1,286	2,570	1,286
Calves (3 mos. To 1 year)	49,867	137,513	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	27,502	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**725,380**	1,686	4,648	2,963	2,963	247	494	329	864	NA	1,687	3,373	**1,687**
Scenario 2														
Milk cows	124,668	343,782	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	51,567	459	1,265	806	806	67	NA	NA	NA	403	403	862	403
Heifers (1 yr to breeding)	59,841	165,016	1,468	4,048	2,580	2,580	215	NA	NA	NA	1,290	1,290	2,758	1,290
Calves (3 mos. To 1 year)	49,867	137,513	1,223	3,373	2,150	2,150	179.15	NA	NA	NA	1,075	1,075	2,298	1,075
Baby Calves (<3 months)	9,973	27,502	245	675	430	430	35.83	NA	NA	NA	215	215	460	215
Total	263,049	**725,380**	3,394	9,360	5,966	5,966	497	NA	NA	NA	2,983	2,983	6,377	**2,983**
Scenario 3														
Milk cows	124,668	343,782	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	51,567	60	165	105	105	9	17	11.67	31	NA	60	120	60
Heifers (1 yr to breeding)	59,841	165,016	191	527	336	336	28	56	37.34	98	NA	191	382	191
Calves (3 mos. To 1 year)	49,867	137,513	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	27,502	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**725,380**	251	692	441	441	37	73	49	129	NA	251	502	**251**
Scenario 4														
Milk cows	124,668	343,782	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	51,567	68	188	120	120	10	NA	NA	NA	60	60	128	60
Heifers (1 yr to breeding)	59,841	165,016	218	602	384	384	32	NA	NA	NA	192	192	410	192
Calves (3 mos. To 1 year)	49,867	137,513	182	502	320	320	26.66	NA	NA	NA	160	160	342	160
Baby Calves (<3 months)	9,973	27,502	36	100	64	64	5.33	NA	NA	NA	32	32	68	32
Total	263,049	**725,380**	505	1,393	888	888	74	NA	NA	NA	444	444	949	**444**

Future Capacity PM10 Emissions from Corrals

Assumes All New Future and Expanded Dairies Subject to Dairy Element 50% Reduction Control Measure
50% Reduced Herd Size

	Uncontrolled Emissions					50% Controlled Emission Reduction from Future New and Expanded Dairies							Controlled Future Conditions	
Animal Type	Existing Head	Future 50% Reduced Total Head Capacity	Emissons from Existing Head (tons/year)	Emissons from 50% Reduced Total Head Capacity (tons/year)	Net Increase in Emissons under Future Conditions (tons per year)	Emissions from Future Expanded and New Dairies (tons/year)	Emissions from Future Expanded and New Dairies (tons/month)	Zero % reduction in Jan and Feb (tons/2months)	25% further reduction in Dec. & Mar. (tons/2 months)	50% reduction from Apr through Nov (tons/8 months)	50% reduction year round (tons/year)	Total Controlled Emission Reduction (tons/year)	Total Future Conditions (tons/year)	Total Net Emission Increase under Future Conditions (tons/year)
Scenario 1														
Milk cows	124,668	190,990	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	28,649	401	615	214	214	18	36	23.74	62	NA	122	523	122
Heifers (1 yr to breeding)	59,841	91,676	1,284	1,968	683	683	57	114	75.95	199	NA	389	1,673	389
Calves (3 mos. To 1 year)	49,867	76,396	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	15,279	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**402,989**	1,686	2,582	897	897	75	149	100	262	NA	511	2,196	**511**
Scenario 2														
Milk cows	124,668	190,990	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	28,649	459	703	244	244	20	NA	NA	NA	122	122	581	122
Heifers (1 yr to breeding)	59,841	91,676	1,468	2,249	781	781	65	NA	NA	NA	390	390	1,858	390
Calves (3 mos. To 1 year)	49,867	76,396	1,223	1,874	651	651	54.22	NA	NA	NA	325	325	1,548	325
Baby Calves (<3 months)	9,973	15,279	245	375	130	130	10.84	NA	NA	NA	65	65	310	65
Total	263,049	**402,989**	3,394	5,200	1,806	1,806	150	NA	NA	NA	903	903	4,297	**903**
Scenario 3														
Milk cows	124,668	190,990	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	28,649	60	91	32	32	3	5	3.53	9	NA	18	78	18
Heifers (1 yr to breeding)	59,841	91,676	191	293	102	102	8	17	11.30	30	NA	58	249	58
Calves (3 mos. To 1 year)	49,867	76,396	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	15,279	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**402,989**	251	384	133	133	11	22	15	39	NA	76	327	**76**
Scenario 4														
Milk cows	124,668	190,990	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	28,649	68	105	36	36	3	NA	NA	NA	18	18	86	18
Heifers (1 yr to breeding)	59,841	91,676	218	335	116	116	10	NA	NA	NA	58	58	277	58
Calves (3 mos. To 1 year)	49,867	76,396	182	279	97	97	8.07	NA	NA	NA	48	48	230	48
Baby Calves (<3 months)	9,973	15,279	36	56	19	19	1.61	NA	NA	NA	10	10	46	10
Total	263,049	**402,989**	505	774	269	269	22	NA	NA	NA	134	134	639	**134**

10% Herd Reduction Controlled ROG Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% ROG Reduction Control Measure;
Existing Dairies and Expansion Limits are Exempt from Dairy Element ROG Control Measures

Animal Type	Future Total Head Capacity	10% Reduced Herd Capacity
Milk cows	381,980	343,782
Dry Cows & bred heifers	57,297	51,567
Heifers (1 yr to breeding)	183,351	165,016
Calves (3 mos. To 1 year)	152,792	137,513
Baby Calves (<3 months)	30,558	27,502
Total	**805,978**	**725,380**

Animal Type	Emission Factor (lb/head-yr)	**Existing Dairies**					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	12.88	124,668	24,559	149,227	803	158	961
Dry Cows & bred heifers	12.88	18,700	3,684	22,384	120	24	144
Heifers (1 yr to breeding)	12.88	59,841	11,788	71,629	385	76	461
Calves (3 mos. To 1 year)	12.88	49,867	9,824	59,691	321	63	384
Baby Calves (<3 months)	12.88	9,973	1,965	11,938	64	13	77
Total		263,049	51,820	314,868	1,694	334	2,028

Animal Type	Emission Factor (lb/head-yr)	**New Dairies/Dairy Expansion[3]**				
		10% Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	12.88	194,555	2,505,888	1,253	626	626
Dry Cows & bred heifers	12.88	29,183	375,883	188	94	94
Heifers (1 yr to breeding)	12.88	93,387	1,202,830	601	301	301
Calves (3 mos. To 1 year)	12.88	77,822	1,002,355	501	251	251
Baby Calves (<3 months)	12.88	15,564	200,468	100	50	50
Total		410,512	5,287,424	2,644	1,322	1,322

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**1,587**	**785**
Dry Cows & bred heifers	**238**	**118**
Heifers (1 yr to breeding)	**762**	**377**
Calves (3 mos. To 1 year)	**635**	**314**
Baby Calves (<3 months)	**127**	**63**
Total	**3,350**	**1,656**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% ROG Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% ROG Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% ROG Control Measure.

[5] The 50% ROG Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

50% Herd Reduction Controlled ROG Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% ROG Reduction Control Measure; Existing Dairies and Expansion Limits are Exempt from Dairy Element ROG Control Measures

Animal Type	Future Total Head Capacity	50% Reduced Herd Capacity
Milk cows	381,980	190,990
Dry Cows & bred heifers	57,297	28,649
Heifers (1 yr to breeding)	183,351	91,676
Calves (3 mos. To 1 year)	152,792	76,396
Baby Calves (<3 months)	30,558	15,279
Total	**805,978**	**402,989**

Animal Type	Emission Factor (lb/head-yr)	**Existing Dairies**					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	12.88	124,668	24,559	149,227	803	158	961
Dry Cows & bred heifers	12.88	18,700	3,684	22,384	120	24	144
Heifers (1 yr to breeding)	12.88	59,841	11,788	71,629	385	76	461
Calves (3 mos. To 1 year)	12.88	49,867	9,824	59,691	321	63	384
Baby Calves (<3 months)	12.88	9,973	1,965	11,938	64	13	77
Total		263,049	51,820	314,868	1,694	334	2,028

Animal Type	Emission Factor (lb/head-yr)	**New Dairies/Dairy Expansion[3]**				
		50% Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	12.88	41,763	537,915	269	134	134
Dry Cows & bred heifers	12.88	6,264	80,687	40	20	20
Heifers (1 yr to breeding)	12.88	20,046	258,200	129	65	65
Calves (3 mos. To 1 year)	12.88	16,705	215,166	108	54	54
Baby Calves (<3 months)	12.88	3,341	43,033	22	11	11
Total		88,121	1,135,000	568	284	284

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**1,096**	**293**
Dry Cows & bred heifers	**164**	**44**
Heifers (1 yr to breeding)	**526**	**140**
Calves (3 mos. To 1 year)	**438**	**117**
Baby Calves (<3 months)	**88**	**23**
Total	**2,312**	**617**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% ROG Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% ROG Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 50% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% ROG Control Measure.

[5] The 50% ROG Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

10% Herd Reduction Controlled Methane Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% Methane Reduction Control Measure; Existing Dairies and Expansion Limits are Exempt from Dairy Element Methane Control Measures

Animal Type	Future Total Head Capacity	10% Reduced Herd Capacity
Milk cows	381,980	343,782
Dry Cows & bred heifers	57,297	51,567
Heifers (1 yr to breeding)	183,351	165,016
Calves (3 mos. To 1 year)	152,792	137,513
Baby Calves (<3 months)	30,558	27,502
Total	**805,978**	**725,380**

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	112.56	124,668	24,559	149,227	7,016	1,382	8,398
Dry Cows & bred heifers	112.56	18,700	3,684	22,384	1,052	207	1,260
Heifers (1 yr to breeding)	112.56	59,841	11,788	71,629	3,368	663	4,031
Calves (3 mos. To 1 year)	112.56	49,867	9,824	59,691	2,807	553	3,359
Baby Calves (<3 months)	112.56	9,973	1,965	11,938	561	111	672
Total		263,049	51,820	314,868	14,804	2,916	17,721

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		10% Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	112.56	194,555	21,899,144	10,950	5,475	5,475
Dry Cows & bred heifers	112.56	29,183	3,284,872	1,642	821	821
Heifers (1 yr to breeding)	112.56	93,387	10,511,623	5,256	2,628	2,628
Calves (3 mos. To 1 year)	112.56	77,822	8,759,658	4,380	2,190	2,190
Baby Calves (<3 months)	112.56	15,564	1,751,909	876	438	438
Total		410,512	46,207,205	23,104	11,552	11,552

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**13,873**	**6,857**
Dry Cows & bred heifers	**2,081**	**1,029**
Heifers (1 yr to breeding)	**6,659**	**3,291**
Calves (3 mos. To 1 year)	**5,549**	**2,743**
Baby Calves (<3 months)	**1,110**	**549**
Total	**29,273**	**14,468**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% Control Measure.

[5] The 50% Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

50% Herd Reduction Controlled Methane Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% Reduction Control Measure;
Existing Dairies and Expansion Limits are Exempt from Dairy Element Control Measures

Animal Type	Future Total Head Capacity	50% Reduced Herd Capacity
Milk cows	381,980	190,990
Dry Cows & bred heifers	57,297	28,649
Heifers (1 yr to breeding)	183,351	91,676
Calves (3 mos. To 1 year)	152,792	76,396
Baby Calves (<3 months)	30,558	15,279
Total	**805,978**	**402,989**

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	112.56	124,668	24,559	149,227	7,016	1,382	8,398
Dry Cows & bred heifers	112.56	18,700	3,684	22,384	1,052	207	1,260
Heifers (1 yr to breeding)	112.56	59,841	11,788	71,629	3,368	663	4,031
Calves (3 mos. To 1 year)	112.56	49,867	9,824	59,691	2,807	553	3,359
Baby Calves (<3 months)	112.56	9,973	1,965	11,938	561	111	672
Total		263,049	51,820	314,868	14,804	2,916	17,721

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		50% Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	112.56	41,763	4,700,876	2,350	1,175	1,175
Dry Cows & bred heifers	112.56	6,264	705,131	353	176	176
Heifers (1 yr to breeding)	112.56	20,046	2,256,428	1,128	564	564
Calves (3 mos. To 1 year)	112.56	16,705	1,880,351	940	470	470
Baby Calves (<3 months)	112.56	3,341	376,065	188	94	94
Total		88,121	9,918,852	4,959	2,480	2,480

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**9,574**	**2,557**
Dry Cows & bred heifers	**1,436**	**384**
Heifers (1 yr to breeding)	**4,595**	**1,228**
Calves (3 mos. To 1 year)	**3,829**	**1,023**
Baby Calves (<3 months)	**766**	**205**
Total	**20,201**	**5,396**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% Control Measure.

[5] The 50% Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

ROG & Methane Emissions from Manure Decomposition

10% Herd Reduction

Source	Existing	ratio	Head	Future Head (	Future 10% Reduced Total Head Capacity	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
						TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	a	b	c=axb	c1	c2	d	e	f	g=cxd	h=cxe	I=cxf	j=g/2000	k=h/2000	L=I/2000
Milk cows	124,668	1	124,668	381,980	343,782	160.8	112.56	12.88	55,280,146	38,696,102	4,427,940	27,640	19,348	2,214
Dry Cows & bred heifers		0.150	18,700	57,297	51,567	160.8	112.56	12.88	8,292,022	5,804,415	664,191	4,146	2,902	332
Heifers (1 yr to breeding)		0.480	59,841	183,351	165,016	160.8	112.56	12.88	26,534,557	18,574,190	2,125,418	13,267	9,287	1,063
Calves (3 mos. To 1 year)		0.400	49,867	152,792	137,513	160.8	112.56	12.88	22,112,058	15,478,441	1,771,176	11,056	7,739	886
Baby Calves (<3 months)		0.080	9,973	30,558	27,502	160.8	112.56	12.88	4,422,354	3,095,648	354,231	2,211	1,548	177
Total			**263,050**	**805,978**	**725,380**				116,641,136	81,648,795	9,342,955	**58,321**	**40,824**	**4,671**

50% Herd Reduction

Source	Existing	ratio	Head	Future Head (	Future 50% Reduced Total Head Capacity	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
						TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	m1	m2	m3=m1xm2	m4	m5	n	o	p	q=mxn	r=mxo	s=mxp	t=q/2000	u=r/2000	v=s/2000
Milk cows	124,668	1	124,668	381,980	190,990	160.8	112.56	12.88	30,711,192	21,497,834	2,459,966	15,356	10,749	1,230
Dry Cows & bred heifers		0.150	18,700	57,297	28,649	160.8	112.56	12.88	4,606,679	3,224,675	368,995	2,303	1,612	184
Heifers (1 yr to breeding)		0.480	59,841	183,351	91,676	160.8	112.56	12.88	14,741,420	10,318,994	1,180,788	7,371	5,159	590
Calves (3 mos. To 1 year)		0.400	49,867	152,792	76,396	160.8	112.56	12.88	12,284,477	8,599,134	983,987	6,142	4,300	492
Baby Calves (<3 months)		0.080	9,973	30,558	15,279	160.8	112.56	12.88	2,456,863	1,719,804	196,795	1,228	860	98
Total			**263,050**	**805,978**	**402,989**				64,800,631	45,360,442	5,190,531	**32,400**	**22,680**	**2,595**

Summary

	emission (lb/year)			**emission (ton/year)**		
Scenario	**TOG**	**Methane**	**ROG**	**TOG**	**Methane**	**ROG**
10% Reduced Herd Capacity	116,641,136	81,648,795	9,342,955	58,321	40,824	4,671
50% Reduced Herd Capacity	64,800,631	45,360,442	5,190,531	32,400	22,680	2,595

Notes:

Existing & Future data From Table No. 5 (Theoretical Dairy Herd Capacity in Kings County)

Ratio of milk cow to support stock for total cattle capacity in Kings County, as provided in Table No. 5(Theoretical Dairy Capacity of Kings County)

Emission factors are from CARB Livestock Waste Methodology and 1988, Radian; assumed emission factor published is for milk cows; adjusted head to equivalent head using Animal Unit (AU) conversion factors.

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
10% Herd Reduction				
milk cows	343,782	28.37	9,754,196	4,877
dry cows&bred	51,567	28.37	1,463,129	732
heifers (1yr-bred)	165,016	8.54	1,408,777	704
3mo-1yr calves	137,513	3.53	485,365	243
baby calves	27,502	3.53	97,072	49
Total	725,380		13,208,540	6,604
50% Herd Reduction				
milk cows	190,990	28.37	5,418,998	2,709
dry cows&bred	28,649	28.37	812,850	406
heifers (1yr-bred)	91,676	8.54	782,654	391
3mo-1yr calves	76,396	3.53	269,647	135
baby calves	15,279	3.53	53,929	27
Total	402,989		7,338,078	3,669

Notes:
Emission factors obtained from 1994 Battye Report; emission factors reflect stable & storage emission factor components only.

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
10% Herd Reduction				
milk cows	343,782	74.00	25,439,868	12,720
dry cows&bred	51,567	74.00	3,815,980	1,908
heifers (1yr-bred)	165,016	74.00	12,211,177	6,106
3mo-1yr calves	137,513	74.00	10,175,947	5,088
baby calves	27,502	74.00	2,035,163	1,018
Total	725,380		53,678,135	**26,839**
50% Herd Reduction				
milk cows	190,990	74.00	14,133,260	7,067
dry cows&bred	28,649	74.00	2,119,989	1,060
heifers (1yr-bred)	91,676	74.00	6,783,987	3,392
3mo-1yr calves	76,396	74.00	5,653,304	2,827
baby calves	15,279	74.00	1,130,646	565
Total	402,989		29,821,186	14,911

Notes:
Emission factors obtained from James, T., Freitas, N., Ashbaugh, L., and D. Meyer, 1997, Field Estimates of Ammonia Volatilization from Cattle Production Facilities. In Proceedings of Emission Inventory Specialty Conference, Air and Waste Management Association, Pittsburgh, PA. pp. 259-267.
Emission factor does not speciate between the different cattle types (e.g., heifers, calves, cows) as it reflects the average emission factor for all cattle
types; estimate assumes that ratios of cattle types are similar to the dairy studied
in developing the emission factor.

Methane Generation from Dairy Cattle

Animal type	#cows	Emission Factor (lb CH4/head/year)	Emissions (tons CH4/year)	Notes
10% Herd Reduction				
milk cows	343,782	262.5	45,121	considered mature cows
dry cows&bred	51,567	152	3,919	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	165,016	134.6	11,106	considered replacement cows from 12 -24 months
3mo-1yr calves	137,513	45.5	3,128	considered replacement cows from 0-12 months
baby calves	27,502	45.5	626	considered replacement cows from 0-12 months
Total	725,380		**63,900**	
50% Herd Reduction				
milk cows	190,990	262.5	25,067	considered mature cows
dry cows&bred	28,649	152	2,177	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	91,676	134.6	6,170	considered replacement cows from 12 -24 months
3mo-1yr calves	76,396	45.5	1,738	considered replacement cows from 0-12 months
baby calves	15,279	45.5	348	considered replacement cows from 0-12 months
Total	402,989		**35,500**	

Notes:
Emission factors obtained from CARB and Radian Report

URBEMIS 7G: Version 3.1

File Name: 99233ALL.URB
Project Name: 5000-Cow Dairy, Dairy Element
Project Location: San Joaquin Valley

DETAILED REPORT
(Tons/Year)

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2020 Temperature (F): 100 Season: Annual

EMFAC Version: EMFAC7G (10/96)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
5000-cow dairy	84.00 trips / trips/dairy	76.00	6,384.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Duty Autos	30.00	1.16	98.58	0.26
Light Duty Trucks	30.00	0.13	99.54	0.33
Medium Duty Trucks	0.00	1.44	98.56	
Lite-Heavy Duty Trucks	0.00	19.56	40.00	40.44
Med.-Heavy Duty Trucks	33.00	19.56	40.00	40.44
Heavy-Heavy Trucks	7.00			100.00
Urban Buses	0.00			100.00
Motorcycles	0.00	100.00 % all fuels		