

Nutrient Management Field Guide



Sustainable Conservation



California Dairy Campaign
"Dairymen Working For Dairymen"



THE
SOURCE GROUP, INC.



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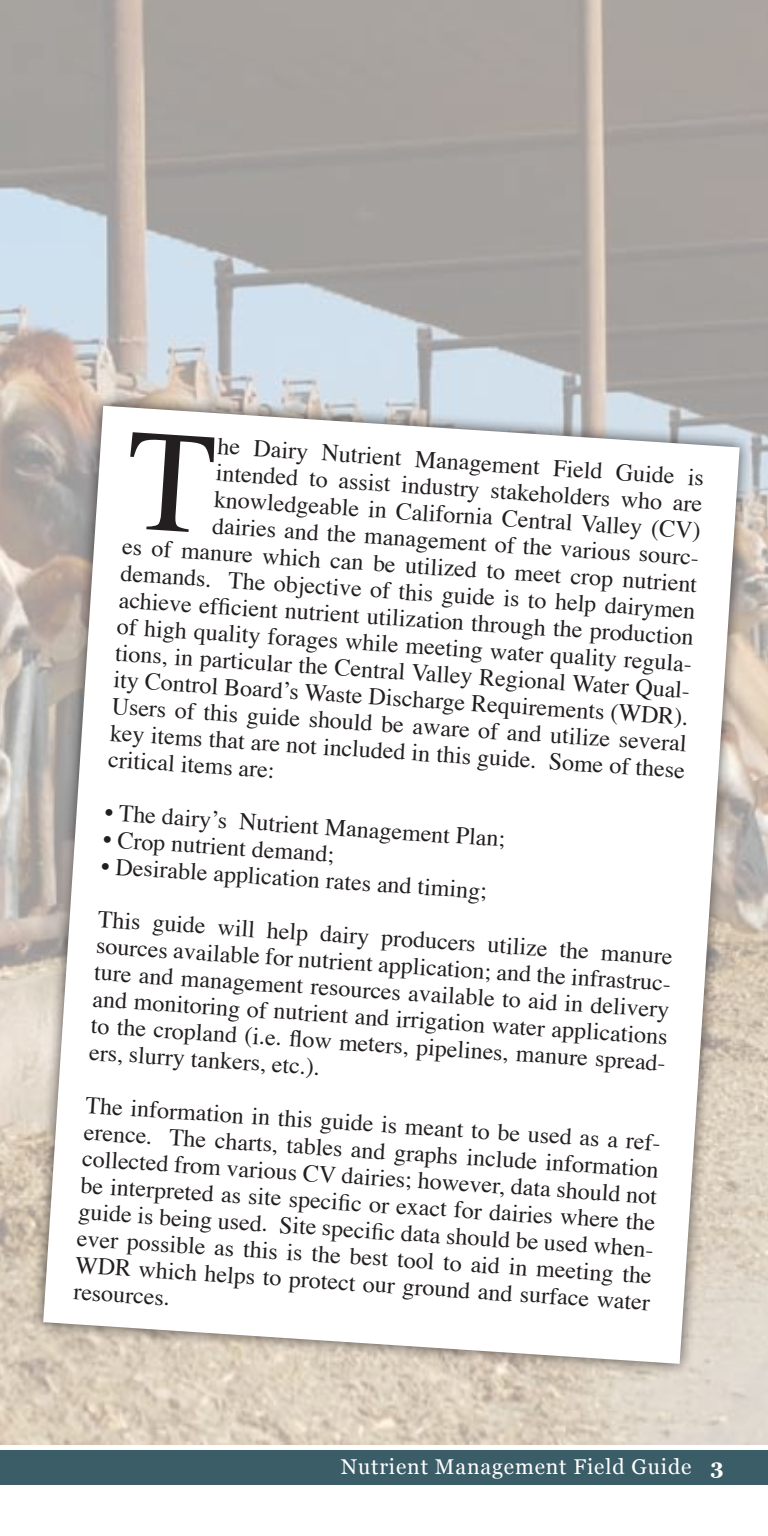
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The Dairy Nutrient Management Field Guide is intended to assist industry stakeholders who are knowledgeable in California Central Valley (CV) dairies and the management of the various sources of manure which can be utilized to meet crop nutrient demands. The objective of this guide is to help dairymen achieve efficient nutrient utilization through the production of high quality forages while meeting water quality regulations, in particular the Central Valley Regional Water Quality Control Board's Waste Discharge Requirements (WDR). Users of this guide should be aware of and utilize several key items that are not included in this guide. Some of these critical items are:

- The dairy's Nutrient Management Plan;
- Crop nutrient demand;
- Desirable application rates and timing;

This guide will help dairy producers utilize the manure sources available for nutrient application; and the infrastructure and management resources available to aid in delivery and monitoring of nutrient and irrigation water applications to the cropland (i.e. flow meters, pipelines, manure spreaders, slurry tankers, etc.).

The information in this guide is meant to be used as a reference. The charts, tables and graphs include information collected from various CV dairies; however, data should not be interpreted as site specific or exact for dairies where the guide is being used. Site specific data should be used whenever possible as this is the best tool to aid in meeting the WDR which helps to protect our ground and surface water resources.

Crop Nutrient Uptake

Nutrient uptake values should be used as a reference only. Crop removal data from your fields should be used to plan nutrient applications.

	Total Nutrient Uptake (lb/A)					
	N	N X 1.4	P ₂ O ₅	K ₂ O	Mg	S
Corn Silage 30 tons/A	240	336	105	240	-	-
Oat Silage, soft-dough 16 tons/A	160	224	59	159	-	-
Wheat Silage, soft-dough 18 tons/A	198	277	70	180	-	-
Triticale Silage, soft-dough 22 tons/A	220	308	86	198	-	-
Alfalfa* 10 tons/A	560	784	150	600	50	50
Clover-Grass 6 ton/A	300	420	90	360	30	30
Ryegrass 5 tons/A	215	301	85	240	40	-
Sugar Beets 25 tons/A	212	297	33	458	67	37
Sorghum-Sudan 8 tons/A	320	448	122	466	48	-
Forage Sorghum 8 tons/A	198	277	67	286	35	18
Pasture** 4 tons/A	140	196	41	192	-	-

Sources:

Central Valley Dairy Waste and Nutrient Management - Crop Type Help.htm
International Plant Nutrition Institute and Foundation for Agronomic Research. Plant Food Uptake.

** Alfalfa and Pasture yield based on 10% moisture.*

*** Pasture yield and nutrient removal varies significantly based on plant species, management and harvest methods.*

Normal Year Crop Water Use

Alfalfa, Feb. 1-Nov.1		Cotton, Acala, Apr. 10-Oct 15		Irrigated Wheat, Jan.1-June 10	
Month	Water Use in./day	Month	Water Use in./day	Month	Water Use in./day
Jan.	0.04	Jan.		Jan.	0.03
Feb.	0.05	Feb.		Feb.	0.04
Mar.	0.11	Mar.		Mar.	0.13
Apr.	0.17	Apr.	0.05	Apr.	0.19
May	0.22	May	0.64	May	0.29
Jun.	0.27	Jun.	0.25	Jun.	0.10
Jul.	0.27	Jul.	0.34	Jul.	
Aug.	0.22	Aug.	0.27	Aug.	
Sept.	0.17	Sept.	0.10	Sept.	
Oct.	0.11	Oct.	0.01	Oct.	
Nov.	0.05	Nov.		Nov.	
Dec.	0.03	Dec.		Dec.	

Pasture, Cool Season		Silage Corn, Apr. 15-Sept. 15		Silage Corn, May 15-Sept. 30	
Month	Water Use in./day	Month	Water Use in./day	Month	Water Use in./day
Jan.	0.03	Jan.		Jan.	
Feb.	0.06	Feb.		Feb.	
Mar.	0.11	Mar.		Mar.	
Apr.	0.17	Apr.	0.04	Apr.	
May	0.24	May	0.11	May	0.06
Jun.	0.28	Jun.	0.26	Jun.	0.11
Jul.	0.30	Jul.	0.33	Jul.	0.30
Aug.	0.26	Aug.	0.26	Aug.	0.29
Sept.	0.19	Sept.	0.13	Sept.	0.16
Oct.	0.13	Oct.		Oct.	
Nov.	0.04	Nov.		Nov.	
Dec.	0.03	Dec.		Dec.	

Source: Procedure for Developing CNMPs, NRCS California, August 2008.

Soil Sampling

SOIL SAMPLING CHART

Type of Test	Purpose	Limitations	Frequency	Time of Year	Depth of Sampling
Pre-Plant Nitrate	RECOMMENDED under dairy WDRs. Assess currently available N from planting through early season	Not useful where leaching is excessive, typically in sandier soils. Not calibrated for California, but can provide rough assessment	Annually or (for double crop) semi-annually	After pre-irrigation and before any pre-plant manure or N fertilizer application	0-2 ft or deeper
Post-Plant Nitrate (In other states called PSNT - "Pre-Sidedress Nitrate Test")	Assess currently plant unavailable N through mid-season. May be useful to confirm nutrient budget.	Not useful where leaching is excessive, typically in sandier soils. Not calibrated for California, but can provide rough assessment	One or more times per season	Post-emergence thorough mid-season	0-1 ft or deeper
Post-Harvest (or shortly before harvest) Nitrate	RECOMMENDED under WDRs. Retrospective evaluation of mid to late-season N program.	Not useful where leaching is excessive in mid- to late-season.	Audit basis every 3 years on selected fields	From just before to a few weeks after harvest of summer annual crops	0-3 ft or deeper in 1 ft increments
Soil Total N or Soil Organic Matter	Indicator of seasonal mineralizable N in soil	Rough indicator. Not well related to the "active" fraction of soil organic N. Interpretation based on small amount of UC research.	Suggest every 3 years	Suggest fall, prior to any manure applications	Suggest 0-1 ft
Soil Alkaline Hydrolysis N (UC modification of Illinois amino sugar test)	Indicator of seasonal mineralizable N in soil	Same limitations as total N but in research showed somewhat better relationship to mineralizable N. Not sensitive to recent manure applications	Suggest every 3 years	Suggest fall	Suggest 0-1 ft
Total P (analytical method, sampling depth not specified by Regional Board)	REQUIRED under WDRs. May be used by Regional Board to evaluate potential for P transport to water. Interpretation is not clear at this time	Method for interpretation not known. Studies show that soil total P is not a sensitive or accurate indicator of risk of P release from soil.	Every 5 years, beginning in 2008	Not specified in WDR. Note WDR does specify minimum number of samples per area	Suggest 0-1 ft
Soil Test P ("Olsen P" or "Bicarbonate P" is common in the arid and semi-arid USA)	(2) Assess potential for excessive soluble P level, e.g. where there is potential for transport to surface waters.	Not well calibrated for heavily manured fields.	At least every 3 years or when problem occurs	suggest fall, prior to any manure application	0-1 ft
Soil Test K "Exchangeable K")	(1) Assess adequacy of soil K levels for plant growth; (2) Assess potential for excessive K uptake by forages (RECOMMENDED under WDRs.)	No California data relating level to potential for excessive K uptake by forages.	Every 3 years or when problem occurs	suggest fall, prior to any manure application	0-1 ft

WDR = Waste Discharge Requirements General Order for Existing Milk Cow Dairies. Regional Water Quality Control Board
Central Valley Region.

Source: Stuart Pettygrove and M.C. Mathews, UCCE.

FLOW RATE CONVERSION CHART FOR IRRIGATION AND LIQUID MANURE SOURCES

GPM	CFS	Ac. In/Hr	Gallons/Hr	GPM	CFS	Ac. In/Hr	Gallons/Hr	GPM	CFS	Ac. In/Hr	Gallons/Hr
200	0.4	0.4	12,000	3400	7.6	7.5	204,000	6600	14.7	14.6	396,000
400	0.9	0.9	24,000	3600	8.0	8.0	216,000	6800	15.2	15.0	408,000
600	1.3	1.3	36,000	3800	8.5	8.4	228,000	7000	15.6	15.5	420,000
800	1.8	1.8	48,000	4000	8.9	8.8	240,000	7200	16.0	15.9	432,000
1000	2.2	2.2	60,000	4200	9.4	9.3	252,000	7400	16.5	16.3	444,000
1200	2.7	2.7	72,000	4400	9.8	9.7	264,000	7600	16.9	16.8	456,000
1400	3.1	3.1	84,000	4600	10.2	10.2	276,000	7800	17.4	17.2	468,000
1600	3.6	3.5	96,000	4800	10.7	10.6	288,000	8000	17.8	17.7	480,000
1800	4.0	4.0	108,000	5000	11.1	11.0	300,000	8200	18.3	18.1	492,000
2000	4.5	4.4	120,000	5200	11.6	11.5	312,000	8400	18.7	18.6	504,000
2200	4.9	4.9	132,000	5400	12.0	11.9	324,000	8600	19.2	19.0	516,000
2400	5.3	5.3	144,000	5600	12.5	12.4	336,000	8800	19.6	19.4	528,000
2600	5.8	5.7	156,000	5800	12.9	12.8	348,000	9000	20.1	19.9	540,000
2800	6.2	6.2	168,000	6000	13.4	13.3	360,000	9200	20.5	20.3	552,000
3000	6.7	6.6	180,000	6200	13.8	13.7	372,000	9400	20.9	20.8	564,000
3200	7.1	7.1	192,000	6400	14.3	14.1	384,000	9600	21.4	21.2	576,000
3400	7.6	7.5	204,000	6600	14.7	14.6	396,000	9800	21.8	21.6	588,000

Source: Bob Fry, NRCS and The Source Group

Flow Chart

GALLONS PER MINUTE TO ACHIEVE A TARGET APPLICATION RATE:
30 LBS N/ACRE

Target application rate: 30 lbs N/acre									
lbs/Kgal	lbs/ac-in	mg/L	ppm	irrigation hours/acre					lbs N/acre
				2	1 1/4	1 1/2	1 3/4	1	
0.8	441	100	300	342	399	479	599	719	899
1.3	662	150	200	228	266	320	399	479	599
1.7	882	200	150	171	200	240	300	359	449
2.1	1103	250	120	137	160	192	240	288	359
2.5	1323	300	100	114	133	160	200	240	300
2.9	1544	350	86	98	114	137	171	205	257
3.3	1764	400	75	86	100	120	150	180	225
3.8	1985	450	67	76	89	107	133	160	200
4.2	2205	500	60	68	80	96	120	144	180
4.6	2426	550	54	62	73	87	109	131	163
5.0	2646	600	50	57	67	80	100	120	150
5.4	2867	650	46	53	61	74	92	111	138
5.8	3087	700	43	49	57	68	86	103	128
6.3	3308	750	40	46	53	64	80	96	120
6.7	3528	800	37	43	50	60	75	90	112
7.1	3749	850	35	40	47	56	70	85	106
7.5	3969	900	33	38	44	53	67	80	100
7.9	4190	950	32	36	42	50	63	76	95
8.3	4410	1000	30	34	40	48	60	72	90
irrigation minutes/acre									
				35	30	25	20	15	10
				1027	1198	1438	1797	2397	3595
				685	799	959	1198	1598	2397
				514	599	719	899	1198	1797
				411	479	575	719	959	1438
				342	399	479	599	799	1198
				293	342	411	514	685	1027
				257	300	359	449	599	899
				228	266	320	399	533	799
				205	240	288	359	479	719
				187	218	261	327	436	654
				171	200	240	300	399	599
				158	184	221	277	369	553
				147	171	205	257	342	514
				137	160	192	240	320	479
				128	150	180	225	300	449
				121	141	169	211	282	423
				114	133	160	200	266	399
				108	126	151	189	252	378
				103	120	144	180	240	359

Source: M.C. Mathews, UCCE.

Flow Chart

GALLONS PER MINUTE TO ACHIEVE A TARGET APPLICATION RATE:
40 LBS N/ACRE

lbs/Kgal	lbs/ac-in	mg/L or ppm	Target application rate: 40 lbs N/acre												
			irrigation hours/acre					irrigation minutes/acre							
			2	1½	1½	1¼	1	50	40	35	30	25	20	15	10
0.8	441	100	399	457	533	639	799	959	1198	1370	1598	1917	2397	3196	4793
1.3	662	150	266	304	355	426	533	639	799	913	1065	1278	1598	2130	3196
1.7	882	200	200	228	266	320	399	479	599	685	799	959	1198	1598	2397
2.1	1103	250	160	183	213	256	320	383	479	548	639	767	959	1278	1917
2.5	1323	300	133	152	178	213	266	320	399	457	533	639	799	1065	1598
2.9	1544	350	114	130	152	183	228	274	342	391	457	548	685	913	1370
3.3	1764	400	100	114	133	160	200	240	300	342	399	479	599	799	1198
3.8	1985	450	89	101	118	142	178	213	266	304	355	426	533	710	1065
4.2	2205	500	80	91	107	128	160	192	240	274	320	383	479	639	959
4.6	2426	550	73	83	97	116	145	174	218	249	291	349	436	581	872
5.0	2646	600	67	76	89	107	133	160	200	228	266	320	399	533	799
5.4	2867	650	61	70	82	98	123	147	184	211	246	295	369	492	737
5.8	3087	700	57	65	76	91	114	137	171	196	228	274	342	457	685
6.3	3308	750	53	61	71	85	107	128	160	183	213	256	320	426	639
6.7	3528	800	50	57	67	80	100	120	150	171	200	240	300	399	599
7.1	3749	850	47	54	63	75	94	113	141	161	188	226	282	376	564
7.5	3969	900	44	51	59	71	89	107	133	152	178	213	266	355	533
7.9	4190	950	42	48	56	67	84	101	126	144	168	202	252	336	505
8.3	4410	1000	40	46	53	64	80	96	120	137	160	192	240	320	479

Source: M.C. Mathews, UCCE.

Flow Chart

GALLONS PER MINUTE TO ACHIEVE A TARGET APPLICATION RATE:
50 LBS N/ACRE

lbs/Kgal lbs/ac-in mg/L or ppm			Target application rate: 50 lbs N/acre													
			irrigation hours/acre					irrigation minutes/acre								
			2	1½	1½	1¼	1	50	40	35	30	25	20	15	10	
0.8	441	100	499	571	666	799	999	1198	1498	1712	1997	2397	2996	3994	5992	
1.3	662	150	333	380	444	533	666	799	999	1141	1331	1598	1997	2663	3994	
1.7	882	200	250	285	333	399	499	599	749	856	999	1198	1498	1997	2996	
2.1	1103	250	200	228	266	320	399	479	599	685	799	959	1198	1598	2397	
2.5	1323	300	166	190	222	266	333	399	499	571	666	799	999	1331	1997	
2.9	1544	350	143	163	190	228	285	342	428	489	571	685	856	1141	1712	
3.3	1764	400	125	143	166	200	250	300	374	428	499	599	749	999	1498	
3.8	1985	450	111	127	148	178	222	266	333	380	444	533	666	888	1331	
4.2	2205	500	100	114	133	160	200	240	300	342	399	479	599	799	1198	
4.6	2426	550	91	104	121	145	182	218	272	311	363	436	545	726	1089	
5.0	2646	600	83	95	111	133	166	200	250	285	333	399	499	666	999	
5.4	2867	650	77	88	102	123	154	184	230	263	307	369	461	615	922	
5.8	3087	700	71	82	95	114	143	171	214	245	285	342	428	571	856	
6.3	3308	750	67	76	89	107	133	160	200	228	266	320	399	533	799	
6.7	3528	800	62	71	83	100	125	150	187	214	250	300	374	499	749	
7.1	3749	850	59	67	78	94	117	141	176	201	235	282	352	470	705	
7.5	3969	900	55	63	74	89	111	133	166	190	222	266	333	444	666	
7.9	4190	950	53	60	70	84	105	126	158	180	210	252	315	420	631	
8.3	4410	1000	50	57	67	80	100	120	150	171	200	240	300	399	599	

Source: M.C. Mathews, UCCE.

Flow Chart

GALLONS PER MINUTE TO ACHIEVE A TARGET APPLICATION RATE: 60 LBS N/ACRE

Target application rate: 60 lbs N/acre															
lbs/Kgal	lbs/ac-in	mg/L or ppm	irrigation hours/acre					irrigation minutes/acre							
			2	1½	1½	1¼	1	50	40	35	30	25	20	15	10
0.8	441	100	599	685	799	959	1198	1438	1797	2054	2397	2876	3595	4793	7190
1.3	662	150	399	457	533	639	799	959	1198	1370	1598	1917	2397	3196	4793
1.7	882	200	300	342	399	479	599	719	899	1027	1198	1438	1797	2397	3595
2.1	1103	250	240	274	320	383	479	575	719	822	959	1150	1438	1917	2876
2.5	1323	300	200	228	266	320	399	479	599	685	799	959	1198	1598	2397
2.9	1544	350	171	196	228	274	342	411	514	587	685	822	1027	1370	2054
3.3	1764	400	150	171	200	240	300	359	449	514	599	719	899	1198	1797
3.8	1985	450	133	152	178	213	266	320	399	457	533	639	799	1065	1598
4.2	2205	500	120	137	160	192	240	288	359	411	479	575	719	959	1438
4.6	2426	550	109	125	145	174	218	261	327	374	436	523	654	872	1307
5.0	2646	600	100	114	133	160	200	240	300	342	399	479	599	799	1198
5.4	2867	650	92	105	123	147	184	221	277	316	369	442	553	737	1106
5.8	3087	700	86	98	114	137	171	205	257	293	342	411	514	685	1027
6.3	3308	750	80	91	107	128	160	192	240	274	320	383	479	639	959
6.7	3528	800	75	86	100	120	150	180	225	257	300	359	449	599	899
7.1	3749	850	70	81	94	113	141	169	211	242	282	338	423	564	846
7.5	3969	900	67	76	89	107	133	160	200	228	266	320	399	533	799
7.9	4190	950	63	72	84	101	126	151	189	216	252	303	378	505	757
8.3	4410	1000	60	68	80	96	120	144	180	205	240	288	359	479	719

Source: M.C. Mathews, UCCE.

Flow Chart

GALLONS PER MINUTE TO ACHIEVE A TARGET APPLICATION RATE:
70 LBS N/ACRE

lbs/Kgal	in	mg/L	ppm	Target application rate: 70 lbs N/acre													
				Irrigation hours/acre					Irrigation minutes/acre								
				2	1½	1½	1½	1	50	40	35	30	25	20	15	10	
0.8	441	100	699	799	932	1118	1398	1678	2097	2397	2796	3355	4194	5592	8388		
1.3	662	150	466	533	621	746	932	1118	1398	1598	1864	2237	2796	3728	5592		
1.7	882	200	350	399	466	559	699	839	1049	1198	1398	1678	2097	2796	4194		
2.1	1103	250	280	320	373	447	559	671	839	959	1118	1342	1678	2237	3355		
2.5	1323	300	233	266	311	373	466	559	699	799	932	1118	1398	1864	2796		
2.9	1544	350	200	228	266	320	399	479	599	685	799	959	1198	1598	2397		
3.3	1764	400	175	200	233	280	350	419	524	599	699	839	1049	1398	2097		
3.8	1985	450	155	178	207	249	311	373	466	533	621	746	932	1243	1864		
4.2	2205	500	140	160	186	224	280	336	419	479	559	671	839	1118	1678		
4.6	2426	550	127	145	169	203	254	305	381	436	508	610	763	1017	1525		
5.0	2646	600	117	133	155	186	233	280	350	399	466	559	699	932	1398		
5.4	2867	650	108	123	143	172	215	258	323	369	430	516	645	860	1291		
5.8	3087	700	100	114	133	160	200	240	300	342	399	479	599	799	1198		
6.3	3308	750	93	107	124	149	186	224	280	320	373	447	559	746	1118		
6.7	3528	800	87	100	117	140	175	210	262	300	350	419	524	699	1049		
7.1	3749	850	82	94	110	132	164	197	247	282	329	395	493	658	987		
7.5	3969	900	78	89	104	124	155	186	233	266	311	373	466	621	932		
7.9	4190	950	74	84	98	118	147	177	221	252	294	353	441	589	883		
8.3	4410	1000	70	80	93	112	140	168	210	240	280	336	419	559	839		

Source: M.C. Matthews, UCCE.

Flow Chart

GALLONS PER MINUTE TO ACHIEVE A TARGET APPLICATION RATE:
80 LBS N/ACRE

Target application rate: 80															lbs N/acre				
lbs/Kgal	lbs/ac-in	mg/L	ppm	irrigation hours/acre					irrigation minutes/acre										
				2	1½	1½	1½	1	50	40	35	30	25	20	15	10			
0.8	441	100	799	913	1065	1278	1598	1917	2397	2739	3196	3835	4793	6391	9587				
1.3	662	150	533	609	710	852	1065	1278	1598	1826	2130	2556	3196	4261	6391				
1.7	882	200	399	457	533	639	799	959	1198	1370	1598	1917	2397	3196	4793				
2.1	1103	250	320	365	426	511	639	767	959	1096	1278	1534	1917	2556	3835				
2.5	1323	300	266	304	355	426	533	639	799	913	1065	1278	1598	2130	3196				
2.9	1544	350	228	261	304	365	457	548	685	783	913	1096	1370	1826	2739				
3.3	1764	400	200	228	266	320	399	479	599	685	799	959	1198	1598	2397				
3.8	1985	450	178	203	237	284	355	426	533	609	710	852	1065	1420	2130				
4.2	2205	500	160	183	213	256	320	383	479	548	639	767	959	1278	1917				
4.6	2426	550	145	166	194	232	291	349	436	498	581	697	872	1162	1743				
5.0	2646	600	133	152	178	213	266	320	399	457	533	639	799	1065	1598				
5.4	2867	650	123	140	164	197	246	295	369	421	492	590	737	983	1475				
5.8	3087	700	114	130	152	183	228	274	342	391	457	548	685	913	1370				
6.3	3308	750	107	122	142	170	213	256	320	365	426	511	639	852	1278				
6.7	3528	800	100	114	133	160	200	240	300	342	399	479	599	799	1198				
7.1	3749	850	94	107	125	150	188	226	282	322	376	451	564	752	1128				
7.5	3969	900	89	101	118	142	178	213	266	304	355	426	533	710	1065				
7.9	4190	950	84	96	112	135	168	202	252	288	336	404	505	673	1009				
8.3	4410	1000	80	91	107	128	160	192	240	274	320	383	479	639	959				

Source: M.C. Mathews, UCCE.

Moisture By Feel

ESTIMATING AVAILABLE MOISTURE BY FEEL

Sands					
Sandy Loam to Fine Sandy Loam		Loam to Clay Loam		Clay	
Percent of readily available moisture remaining	0.50 - 1.0 inches of avail. Water per foot of soil.	1.25 - 1.75 inches of avail. water per foot of soil.	1.50 - 2.25 inches of avail. water per foot.	2.0 - 2.50 inches of avail. water per foot of soil.	
FEEL OR APPEARANCE					
0	Dry, loose, single-grained, flows through fingers.	Dry, loose, single-grained, flows through fingers, or may form soft clods.	Powdery dry, may form clods, which can be broken to fine granules by hand.	Hard, baked, cracked, sometimes has loose crumbs on surface.	
50 or less	Still appears to be dry; will not form ball with pressure*	Still appears to be dry; will not form a ball with pressure*	Somewhat crumbly, but will not hold together with pressure.	Somewhat pliable, will call under pressure.	
50 - 75	Same as sand under 50 or less.	Tends to call under pressure, but seldom holds together.	Forms a ball, somewhat plastic; will sometimes slick slightly with pressure.	Forms a ball; will ribbon out between thumb and fingers.	
75 - Field	Tends to stick together slightly, sometimes forms a very weak ball under pressure.	Forms a weak ball, breaks easily; will not slick.	Forms a ball and is very pliable; slicks readily.	Easily ribbons out between fingers; has a slick feeling.	
	Upon squeezing, no free water appears on soil, but wet outline of ball is left on hand.	Same as sand.	Same as sand.	Same as sand.	

* Ball is formed by squeezing a handful of soil very firmly.
Source: USDA; NRCS.

Lagoon Properties

LAGOON WATER NUTRIENT VALUES PER QUARTER 2009

Data has been summarized for demonstration purposes. Nutrient levels vary significantly depending on site conditions and management. Collecting samples from your dairy is necessary to properly characterize nutrient content of process wastewater, manure and slurry.

		TKN	Ammonium	Phosphate	Avail. Potassium
		# / 1,000 gallons			
1st Qrt:	Average	5.70	3.02	1.38	8.22
	Range	1.45 - 16.1	1.5 - 5.0	0.63 - 2.41	3.59 - 13.98
	n	58	44	44	44
		TKN	Ammonium	Phosphate	Avail. Potassium
2nd Qrt:	Average	4.65	2.58	0.90	6.40
	Range	1.23 - 9.65	0.7 - 5.10	0.29 - 1.74	1.24 - 13.12
	n	124	99	100	100
		TKN	Ammonium	Phosphate	Avail. Potassium
3rd Qrt:	Average	2.65	1.72	0.76	5.55
	Range	0.84 - 5.32	0.40 - 3.70	0.27 - 1.42	1.27 - 12.98
	n	187	164	164	161
		TKN	Ammonium	Phosphate	Avail. Potassium
4th Qrt:	Average	3.32	2.27	0.92	6.34
	Range	1.35 - 6.36	0.80 - 4.10	0.50 - 1.45	2.28 - 11.12
	n	136	99	98	104

MANURE NUTRIENT CONCENTRATION 2009

	Total Nitrogen	Phosphate	Avail. K
	# / ton		
Average	38.3	21.5	37.0
Range	20.4 - 59.8	7.3 - 39.4	8.4 - 79.2
n	241	265	279

*Data source - Denele Analytical, analytical data for year 2009
Reported on Dry Matter basis*

FORMULA TO CONVERT SOLID MANURE DRY WEIGHT BASIS TO "AS APPLIED"

$N \text{ lbs/ton (DWB)} \times (100 - \% \text{ moisture from lab sample}/100) = N \text{ lbs/ton as applied}$

LAGOON SLURRY NUTRIENT CONCENTRATION 2009

	TKN	Phosphate	Avail. K
	# / 1,000 gallons		
Average	19.4	1.58	14.0
Range	6.65 - 28.6	0.86 - 2.54	4.55 - 44.9
n	9	9	9

Data source - Denele Analytical, analytical data for year 2009

Important Dates

WDRS REQUIREMENTS GENERAL ORDER NO. R5-2007-0035 EXISTING MILK COW DAIRIES SCHEDULE FOR SUBMITTAL OF ANNUAL REPORTS AND INFORMATION

Due Date	Submittal Due	Contents of Submittal	Professional Certification Requirements
1 July 2010	Annual Report	Per Monitoring and Reporting Program No. R5-2007-0035 including Annual Dairy Facility Assessment with facility modifications implemented to date.	California Registered Professional
1 July 2010	Waste Management Plan (with Retrofitting Plan/Schedule) Including the Following items in Attachment B (Waste Management Plan); Items I.F.1b, I.F.2.b	Retrofitting needed to improve storage capacity, flood protection, or design of production area - may include design/construction of new pond, berms for flood protection, grading for drainage, etc. Facility Description	California Registered Professional None
1 July 2010	Item II	Storage Capacity	California Registered Professional
	Item III	Flood Protection	California Registered Professional
	Item IV	Production Area Design/Construction	None
	Item VI	Documentation there are no cross connections.	Trained Professional
1 July 2010	Status on facility retrofitting completed or in progress	Status on facility retrofitting completion as proposed (1 July 2009) for the Nutrient Management Plan.	None
31 Dec. 2010	Status on facility retrofitting completed or in progress	Status on facility retrofitting completion as proposed (1 July 2010) for the Waste Management Plan.	None
1 July 2011	Annual Report	Per Monitoring and Reporting Program No. R5-2007-0035 including Annual Dairy Facility Assessment with facility modifications implemented to date.	None
1 July 2011	Certification of Facility Retrofitting Completion		
	For Nutrient Management Plan	Certify completion of retrofitting proposed (1 July 2009) to improve nitrogen balance.	Certified Nutrient Management Specialist
	The Following Items in Attachment B (Waste Management Plan): Item II.C	Certification of completion of modifications made to meet storage capacity requirements.	California Registered Professional
1 July 2011	Item III.D	Certification of completion of modifications made to meet flood protection requirements.	California Registered Professional
	Item IV.C	Certification of modifications made to meet construction criteria for corrals, pens, animal housing area, and manure and feed storage areas.	None
1 July 2012	Annual Report	Per Monitoring and Reporting Program No. R5-2007-0035 including Annual Dairy Facility Assessment with facility modifications implemented to date.	None
1 July 2012	Certification of Nutrient Management Plan implementation	Certification that the Nutrient Management Plan has been completely implemented.	None

Source: http://www.cdqa.org/docs/R5-2007-0035-tab1_modified_to_guide.pdf

Important Dates

SPECIAL ACTIVITY DATES TO REMEMBER

SPECIAL ACTIVITY	REPORT, PLAN, ACTION OR NOTIFICATION DUE	DUE DATES
Any material change or proposed change in the character, location, or volume of the discharge, including any expansion of the facility or development of any treatment technology, or construction of an anaerobic digester	Report of Waste Discharge (GO-18)	At least 140 days prior to any change or proposed change
Significant Noncompliance Event (illegal discharge which threatens human health or the environment)	Verbal incident report to the Central Valley Water Board Office, local environmental health department and to the California Office of Emergency Services (OES); and a Written Noncompliance Report (MRP-10)	Verbal report- within 24 hours; Written report- within two weeks of noncompliance event
Land application monitoring shows Groundwater Limitations or surface water quality objectives or criteria have been exceeded (see page IS-17 of the Information Sheet – <i>Receiving Water Limitations for Dairies</i> – for the most stringent limitations).	Modification of the Nutrient management Plan (GO-16) -to be maintained on-site and submitted at the request of RB5.	Within 90 days of finding Groundwater Limitations or surface water quality objectives or criteria have been exceeded
Planned change in ownership or control of facility	Notification to the Regional Water Quality Control Board; Notify succeeding owner or operator by letter of existence of the General Order (copy to Central Valley Water Board) (SPRR-4) – should also inform succeeding owner/operator of their need to request Central Valley Water Board transfer coverage under the General Order. Notification form available at: http://www.waterboards.ca.gov/centralvalley/water_issues/dairies/index.html .	At least 60 days advance notice
Dairy closure	Closure Plan (GO-19) & Closure Report (GO-20)	Closure plan-at least 90 days before desired termination of coverage under General Order; Closure report-no more than 30 days after completion of site closure

Source: http://www.cdqa.org/docs/Special_Activity_Dates_to_Remember.pdf

Contact Info

ALL SIGNIFICANT NONCOMPLIANCE EVENTS (ILLEGAL DISCHARGES WHICH THREATEN HUMAN HEALTH OR THE ENVIRONMENT) REQUIRE VERBAL INCIDENT REPORTING TO THE FOLLOWING THREE AGENCIES WITHIN 24 HOURS OF THE EVENT:

- **CENTRAL VALLEY REGIONAL WATER QUALITY BOARD**
- **LOCAL ENVIRONMENTAL HEALTH DEPARTMENT**
- **CALIFORNIA OFFICE OF ENVIRONMENTAL SERVICES (OES)**

CENTRAL VALLEY REGIONAL WATER QUALITY BOARD CONTACTS

FOR DAIRIES IN **GLENN, LAKE, COLUSA, SUTTER, YUBA, SIERRA, NEVADA, PLACER, EL DORADO, NAPA, YOLO, SOLANO, SACRAMENTO, AMADOR, CALAVERAS, CONTRA COSTA, SAN JOAQUIN, ALAMEDA, STANISLAUS, TUOLUMNE AND MERCED** COUNTIES:
11020 SUN CENTER DRIVE #200,
RANCHO CORDOVA 95607
(916) 464-3291

FOR DAIRIES IN **FRESNO, KERN, KINGS, MADERA, MARIPOSA AND TULARE** COUNTIES:
REGIONAL WATER QUALITY CONTROL BOARD, CENTRAL VALLEY REGION,
FRESNO OFFICE
1685 "E" STREET, FRESNO 93706
(559) 445-5116

FOR DAIRIES IN **BUTTE, LASSEN, MODOC, PLUMAS, TEHAMA AND SHASTA** COUNTIES:
REGIONAL WATER QUALITY CONTROL BOARD, CENTRAL VALLEY REGION,
REDDING OFFICE
415 KNOLLCREST DRIVE, STE 100,
REDDING 96002
(530) 224-4845

COUNTY ENVIRONMENTAL HEALTH DEPARTMENTS CONTACTS

BUTTE: (530) 538-7581
COLUSA: (530) 458-0395
CONTRA COSTA: (925) 646-5225 x200
EL DORADO: (530) 621-5360
FRESNO: (559) 445-3357
GELNN: (530) 934-6120
KERN: (661) 862-8700
KINGS: (559)584-1411
LAKE LAKEPORT AREA: (707) 263-1164
CLEAR LAKE AREA: (707) 994-2257
MADERA: (559) 675-7821
MARIPOSA: (209) 966-2220
MERCED: (209) 381-7444
NEVADA: (530) 265-1222
PLACER: (530) 745-2300
PULMAS: (530) 283-6355
SACRAMENTO: (916) 875-8400
SAN JOAQUIN: (209) 468-3420
SIERRA: (530) 993-6716
SISKIYOU: (530) 841-2100
STANISLAUS: (209) 525-6700
SUTTER: (530) 822-7400
TEHAMA: (530) 527-8020
TULARE: (559) 733-6441
YUBA: (530) 674-1461 x130

CALIFORNIA OFFICE OF EMERGENCY SERVICES, WARNING CENTER CONTACT
(800) 852-7550 OR (916) 845-8911

WDR GENERAL ORDER DAIRY PRODUCER ASSISTANCE CONTACTS

SUSTAINABLE CONSERVATION
JOSEPH CHOPERENA:
(415) 977-0380 EXT. 320

THE SOURCE GROUP, INC.
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UC DAVIS (530) 752-9391

MILK PRODUCERS COUNCIL

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UNIVERSITY OF CALIFORNIA COOP- ERATIVE EXTENSION

BETSY KARLE, DAIRY PROGRAM

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USDA NRCS

ELK GROVE SERVICE CENTER

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VISALIA SERVICE CENTER
(559) 734-8732

BAKERSFIELD SERVICE CENTER
(661) 336-0967



Sustainable Conservation



**THE
SOURCE GROUP, INC.**



California Dairy Campaign
"dairy men Working For dairy men"

**"FUNDING FOR THIS PROJECT HAS BEEN PROVIDED IN PART
THROUGH AN AGREEMENT WITH THE
STATE WATER RESOURCES CONTROL BOARD."**