Field D (LAA-D)

Years 1 thru 5

NMSU Annual Nutrient Manager Calculation
590 Nutrient Mgt. Jobsheet for Organic & Manure Land Application
USDA-NRCS PLANTS Crop Nutrient Tool
NRCS Phosphorus Index Worksheet for New Mexico
NRCS Irrigation Water Mgt. Conservation Practice Jobsheet 449
NRCS - WEQ Calculations
NRCS RUSLE2 Worksheet Erosion Calculation Record

Dairy Annual Nutrient Manager

Date	11/19/2009	NM STATE UNIVERSITY Dairy Extension Program	Victor E. Cabrera Dairy Specialist dairy.nmsu.edu: Tools vcabrera@nmsu.edu	PLANNED		
Dairy	River Valley Dairy				N Loss	0%
Crop_Year	2009-2010				Goal/Real	Nutrient Needed
Field_ID	LAA-D					
Area (ac)	21					
	Month - Month	Crop	Unit	Yield	N	P
1st Crop	Nov'09-May'10	Triticale (Wheat for green chop 70%)	t/ac	10	2943	391
2nd Crop	Jun'10-Oct'10	Sorghum/Sudangrass, for silage (70%)	t/ac	16	3302	423
					0	0
Total		Nutrient Needed			6,246	814
					Soil Analyses	
Texture by Feel		Clay Loam			N	P
Nutrient Available in Soil			lb/ac		50	206.55
		Nutrient Still Needed			5,196	-3,524
					Effluent Analyses	
					N	P
Effluent Manure Application		NM Dairy Ponds Net from J.S. 590 L&MLA	ac-in	3.65	1993	437
			ac-in		0	0
			ac-in		0	0
		Nutrient Still Needed			3,203	-3,960
					Manure Analyses	
					N	P
Dry Manure Application			t/ac		0	0
			t/ac		0	0
			t/ac		0	0
		Nutrient Still Needed			3,203	-3,960
					Fertilizer Content	
					N	P
Chemical Fertilizers Applied		22-0-0	lb/ac	610	3203	0
			lb/ac		0	0
			lb/ac		0	0
		Annual Nutrient Balance			**0**	**-3,960**

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:	River Valley Dairy	Acres:	21	Date:	11/11/2009	Field ID:	LAA-D

Application Information (enter the units that will be or has been applied to the field):					
Crop Rotation:	Triticale Silage			Needed for field (acin):	30.66
Liquid Applied:	1.46	AcIn/ac		(gal):	832,419
Solids Applied:		ton/ac		Needed for field (tons):	
Liquid Loads Applied:		1000gal/ac		Loads needed for field:	

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:					

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Beef (DM)		0		0		0.0		0		0

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:	145.8	187.1	0.4	100	250

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (99-99.4% liq.)	99		0	42	0	33	0	17	0	68

TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
Book	Test	Book	Test	Book	Test	Book	Test
0.0		0.0		0.0		0.0	

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Wet	80 %	0 (lbs/ton) NH4-N
Liquid (type of application)	**Type of Climate**	**Percent Remaining**	**26.4** (lbs/acin) NH4-N
ace Irr w/o incorp & w/crop canopy	Warm Dry	80 %	**0.0** (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	0	0	0

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	4	13	54
	Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
	0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
<2	Well Drained	88

Summary of Nutrients

Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	26	0
P_2O_5	0.0	13	0
K_2O	0.0	54	0

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	38.7	18.5	79.5

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:	River Valley Dairy	Acres:	21	Date:	11/11/2009	Field ID:	LAA-D

Application Information (*enter the units that will be or has been applied to the field*):

Crop Rotation:	Sudangrass silage			Needed for field (acin):	45.99
Liquid Applied:	2.19	AcIn/ac		(gal):	1,248,629
Solids Applied:		ton/ac	Needed for field (tons):		
Liquid Loads Applied:		1000gal/ac	Loads needed for field:		

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:					

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Beef (DM)		0		0		0.0		0		0

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:	145.8	187.1	0.4	100	250

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (99-99.4% liq.)	99		0	42	0	33	0	17	0	68

TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
Book	Test	Book	Test	Book	Test	Book	Test
0.0		0.0		0.0		0.0	

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Wet	80 %	0 (lbs/ton) NH4-N
Liquid (type of application)	**Type of Climate**	**Percent Remaining**	**26.4** (lbs/acin) NH4-N
face Irr w/o incorp & w/crop canopy	Warm Dry	80 %	0.0 (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	0	0	0

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	4	13	54
	Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
	0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
<2	Well Drained	88

Summary of Nutrients

Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	26	0
P_2O_5	0.0	13	0
K_2O	0.0	54	0

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	58.0	27.7	119.3

USDA Natural Resources Conservation Service
PLANTS
Crop Nutrient Tool

Nutrient Report Summary for the Crop(s) Selected

The table below summarizes the nutrients removed for the crops selected in the previous page. Crop nutrient information for individual crops follow the summary table.

Return to the crop list and make a new selection of crop(s)

Wheat, for green chop
Forage
Triticum sp.
Plant part harvested: Aboveground biomass
Crop yield unit: ton

Nutrients in harvested part (lb/ton) at 70% moisture percentage.

Nitrogen	Phosphorus	Potassium
14.0160	1.8600	

Nutrients removed in harvested part (lb/acre) at 10 ton yield level.

Nitrogen	Phosphorus	Potassium
140.1600	18.6000	

Nutrients removed in harvested part (lb/ton) at 10 ton yield level and 21 acres.

Nitrogen	Phosphorus	Potassium
2943.3600	390.6000	

Element-Fertilizer Equivalents | Average NPK Percentages

«Contents»

Intellectual Property Statement / How to Cite the PLANTS Database

Disclaimers

USDA non-discrimination policy

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Time Generated: Thur 9:32 AM - 11/19/2009

USDA Natural Resources Conservation Service
PLANTS
Crop Nutrient Tool

Nutrient Report Summary for the Crop(s) Selected

The table below summarizes the nutrients removed for the crops selected in the previous page. Crop nutrient information for individual crops follow the summary table.

Return to the crop list and make a new selection of crop(s)

Sorghum/Sudangrass, for silage
Forage
Sorghum bicolor ssp. drummondii
Plant part harvested: Aboveground biomass
Crop yield unit: ton

Nutrients in harvested part (lb/ton) at 70% moisture percentage.

Nitrogen	Phosphorus	Potassium
9.8280	1.2600	15.6600

Nutrients removed in harvested part (lb/acre) at 10 ton yield level.

Nitrogen	Phosphorus	Potassium
98.2800	12.6000	156.6000

Nutrients removed in harvested part (lb/ton) at 10 ton yield level and 21 acres.

Nitrogen	Phosphorus	Potassium
2063.8800	264.6000	3288.6000

Element-Fertilizer Equivalents | Average NPK Percentages

«Contents»

Intellectual Property Statement / How to Cite the PLANTS Database
Disclaimers
USDA non-discrimination policy

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Time Generated: Thur 9:34 AM - 11/19/2009

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	Rock Valley Dairy	Field(s):	LAA-D	Date:	Nov'09
Planner:	Chet Wyant	Location:	DonaAna	Crop:	triticale sil.
Soil Permeablity (in/hr):	0.3	Slope (%):	0.5	Planned/Exist.:	Planned

Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
					X	8
Phosphorus (P_2O_5) Application Rate	None Applied	<30 lbs/ac P_2O_5	30-90 lbs/ac P_2O_5	>90-150 lbs/ac P_2O_5	>150 lbs/ac P_2O_5	
		X				1
Organic Phosphorus Source Application Method	None Applied	Injected Deeper than 2 Inches	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
				X		4
Phosphorus Fertilizer Application Method	None Applied	Placed with Planter Deeper than 2 in.	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
	X					0
Proximity of Nearest Field Edge to Named Stream or Lake	Very Low >1000 feet	Low >500-1000 feet	Medium >200-500 feet	High 30-200 feet	Very High <30 feet	
	X					0
Soil Erosion (wind & water)	Very Low <1 t/ac	Low 1-3 t/ac	Medium >3-5 t/ac	High >5-15 t/ac	Very High >15 t/ac	
	X					0
Runoff Class (Runoff Class Table 2)	Very Low or Negligible	Low	Medium	High	Very High	
		X				1.5
Irrigation Erosion (See QS note)	Not Irrigated or No Furrow Irrigation	Tailwater Recovery or QS<6 for very erodible soils or QS<10 for resistant soils	QS>10 for erosion resistant soils	QS>10 for erodible soils	QS>6 for very erodible soils	
			X			3
Grazing Management	Not Grazed	Graze Crop Residues	Pasture <30% Dry Matter as Supplemental Feed	Pasture 30 to 80% Dry Matter as Supplemental Feed	Pasture 80 to 100% Dry Matter as Supplemental Feed	
	X					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
			X			3

P Hazard Class:	Medium	Total Index Points:	20.5
Phosphorus Application Classification:	N Based		

Notes:

This evaluation has a Medium P hazard class and the nutrient application can be based on N.

Comments: Soil Erosion = (WEQ 10/09 to 5/10) 0.09 t/ac + (RUSLE2) 0.17 t/ac = 0.26 t/ac

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	Rock Valley Dairy	Field(s):	LAA-D	Date:	Jun'10
Planner:	Chet Wyant	Location:	DonaAna	Crop:	sudan sil.
Soil Permeablity (in/hr):	0.3	Slope (%):	0.5	Planned/Exist.:	Exist

Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
					X	8
Phosphorus (P_2O_5) Application Rate	None Applied	<30 lbs/ac P_2O_5	30-90 lbs/ac P_2O_5	>90-150 lbs/ac P_2O_5	>150 lbs/ac P_2O_5	
		X				1
Organic Phosphorus Source Application Method	None Applied	Injected Deeper than 2 inches	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
				X		4
Phosphorus Fertilizer Application Method	None Applied	Placed with Planter Deeper than 2 in.	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
	X					0
Proximity of Nearest Field Edge to Named Stream or Lake	Very Low >1000 feet	Low >500-1000 feet	Medium >200-500 feet	High 30-200 feet	Very High <30 feet	
	X					0
Soil Erosion (wind & water)	Very Low <1 t/ac	Low 1-3 t/ac	Medium >3-5 t/ac	High >5-15 t/ac	Very High >15 t/ac	
	X					0
Runoff Class (Runoff Class Table 2)	Very Low or Negligible	Low	Medium	High	Very High	
		X				1.5
Irrigation Erosion (See QS note)	Not Irrigated or No Furrow Irrigation	Tailwater Recovery or QS<6 for very erodible soils or QS<10 for resistant soils	QS>10 for erosion resistant soils	QS>10 for erodible soils	QS>6 for very erodible soils	
			X			3
Grazing Management	Not Grazed	Graze Crop Residues	Pasture <30% Dry Matter as Supplemental Feed	Pasture 30 to 80% Dry Matter as Supplemental Feed	Pasture 80 to 100% Dry Matter as Supplemental Feed	
	X					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
			X			3

P Hazard Class:	Medium	Total Index Points:	20.5
Phosphorus Application Classification:	N Based		

Notes:

This evaluation has a Medium P hazard class and the nutrient application can be based on N.

Comments: Soil Erosin = (WEQ 6/10 to 10/10) 0.98 t/ac + (RUSLE2) 0.00069 t/ac = 0.98 t/ac

NRCS Natural Resources Conservation Service

Irrigation Water Management

Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: River Valley Dairy **Tract:** 735
Planner: Chet Wyant **Field(s) No.:** LAA-D
Current Land Use: Triticale silage/ Sudangrass Silage **Total Acres:** 21
Date: 11/19/2009 **Date to apply:** 11/1/2009

See the Conservation Plan map for the location of the field(s) to applying IWM.

Purposes (check all that apply)

- ☐ Manage soil moisture to improve crops
- ☑ Optimize use of water
- ☑ Minimize Irrigation Erosion
- ☐ Decrease non-point source pollution
- ☐ Manage salt in the root zone
- ☐ Manage air, soil, or plant microclimate

Conditions where practice applies

This practice is applicable to all irrigated lands. An irrigation system adapted for the site conditions is available and capable of applying water to meet the intended purpose(s).

Soil (Series, Texture, and Map Unit) *Select the soil to manage for:*

Critical soil to manage: **Glendale CL, Mimbres soils, Stellar SICL; 22-37, 221** Intake Family (in/hr): **0.30**

Soil Interpretations for Irrigaiton

Crop Name	Rooting Depth	Moisture Replacement Depth (ft)	Water Holding Capacity (in)	Mgt Allowed Depletion (MAD) (%)	Net Water to Replace (in)	Time Needed to Infiltrate (hrs)
Wheat, winter, silage; Las Cruces	Medium	3.0	6.0	50%	3.0	6.3
Sudangrass, hay or silage; Deming	Medium	3.0	6.0	65%	3.9	9.7

Crop Consumptive Use (CU) Information *(inches/month needed)*

Crop: Wheat, winter, silage; Las Cruces **Total Irrigation Needed:** 10.2 ac in/ac

Month	Est. Frequency (days between irr.)	In/Mo	Month	Est. Frequency (days between irr.)	In/Mo
Jan	>1 Mo.	1.2	Jul		0.0
Feb	>1 Mo.	2.1	Aug		0.0
Mar	27	3.3	Sep	>1 Mo.	0.3
Apr		0.0	Oct	>1 Mo.	1.3
May		0.0	Nov	>1 Mo.	1.2
Jun		0.0	Dec	>1 Mo.	0.9

Crop: Sudangrass, hay or silage; Deming **Total Irrigation Needed:** 14.1 ac in/ac

Month	Est. Frequency (days between irr.)	In/Mo	Month	Est. Frequency (days between irr.)	In/Mo
Jan		0.0	Jul	>1 Mo.	3.3
Feb		0.0	Aug	16	7.2
Mar		0.0	Sep	>1 Mo.	3.7
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Crop:			Total Irrigation Needed:	ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** (days between irr.)	**In/Mo**
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Crop:			Total Irrigation Needed:	ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Farm Irrigation Rating System (FIRS, irrigation system efficiency)

Type of System:	Flood, controlled		System Efficiency (%):	80%
System Capacity (Ditch/Pump/Well):	1400	GPM		

Crop Grown	Days of Operation for CU by crop (days)	Est. System Application Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Wheat, winter, silage; Las Cruces	4	2.84	0.11	System meets CU for crop
Sudangrass, hay or silage; Deming	5	2.84	0.24	System meets CU for crop

Operation and Maintenance Requirements

1. Irrigate when the soils reaches the MAD level, determined by soil moisture monitoring. Use one of the following methods to monitor soil moisture; the feel method, tensiometers, electrical resistance blocks, or moisture probes. Drip or Center Pivots can be irrigated on an as needed basis to meet daily CU.

2. Test irrigation water for Nitrate and Salts (Total Desolved Solids/Electrical Conductivity)

3. Do not exceed the net water to replace listed above when irrigating, unless salts are being managed.

4. Do not apply water at rates that cause runoff or erosion.

5. Monitor the soil to maintain: pH, permeability, salinity, and structure.

6. Application of pond effluent shall not exceed the crop needs (water and nutrient), and will not exceed the water holding capacity listed above.

7. Consider using crops such as sorghum, cotton, or winter wheat when water supplies are short.

8. Avoid traffic on wet soils to minimize soil compaction.

Additional Requirements

Job Approval and Completion

Client: _____ **Date:** 11-23-09

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

USL NRCS Natural Resources Conservation Service

RUSLE2 Worksheet Erosion Calculation Record

Info: Nov'09-May'10 Triticale Silage, Jun'10-Oct'10 Sundangrass Silage

Tract #: 735
Owner name: River Valley Dairy
Field name: LAA-D

Location: New Mexico\DonaAna County\NM_Dona Ana R 9
Soil: Gf GLENDALE CLAY LOAM\GLENDALE clay loam 85%
Slope length (horiz): 100.0 ft
Avg. slope steepness: 0.50 %
T value: 5.0 t/ac/yr

Alternatives:

Management	*Contouring*	*Strips / barriers*	*Diversion/terrace, sediment basin*	*Cons. plan. soil loss, t/ac/yr*	*Description*
a.Single Year/Single Crop Templates\Triticale, silage, plow, irr CT	b. absolute row grade 0.5 percent	(none)	(none)	0.17	
a.Single Year/Single Crop Templates\Haygrazer, sudangrass, disk	b. absolute row grade 0.5 percent	(none)	(none)	0.00069	

NRCS - WEQ CALCULATIONS

Version 9.03 11-19-2007

Producer:	River Valley Dairy	Planner:	Chet Wyant	Location:	Anthony, NM	Tract:	735	Field:	LAA-D		
Crop Rotation:	Triticale Silage/Sundangrass Silage	Climate Data Station:	NM, LAS CRUCES					Site "C" Value:	150		
Tillage Direction (NS/EW):	NS	Length/width ratio:	4	Field Direction (NS/EW):	NS			Field Width (Ft.):	570		
Irrigation (Y or N):	Y	Soil "I":	86	Wind Erodibility Group:	4L	(1-7)		TWF:	2	(see instr.)	
Sum Period Erosion (t/ac):	1.1			No. Yrs in Rotation:	1.0			Av. Annual Wind Erosion:	1.1	(t/ac/yr)	

Calculations and Output

Mgt Periods		Irr.	Soil	Ridge Roughness				Random Roughness	Unsheltered Distance				SCs	Erosion			
Dates		No. of	"I"	Dev.	Ht.	Sp.	"Krd"	"Krr"	Dev.	Prep.	WED	"L"	"V"	"E"	EWE	"IF"	Loss
Begin	End	(#)	(t/ac)	(deg)	(in.)	(in.)	(factor)	(factor)	(deg)	(factor)	(factor)	(ft)	(lbs/ac)	(t/ac)	(%)	(%)	(t/ac)
10/7	10/14/09	0	56	0.0	2	30	0.70	0.86	0.0	3.3	1.010	576	0	30.7	0.3	1.00	0.09
10/14	10/21/09	0	56	0.0	3	30	0.52	0.52	0.0	3.3	1.010	576	6999	0.0	0.3	1.00	0.00
10/21	11/01/09	0	56	0.0	4	11	0.26	0.52	0.0	3.3	1.010	576	2851	0.0	0.5	1.00	0.00
11/1	01/30/10	1	56	0.0	2	30	0.69	0.99	0.0	4.0	1.010	576	2774	0.0	16.3	0.98	0.00
1/30	02/14/10	2	56	0.0	2	30	0.69	0.86	0.0	4.0	1.010	576	5985	0.0	11.3	0.73	0.00
2/14	03/01/10	1	56	0.0	2	30	0.69	0.86	0.0	4.0	1.010	576	6110	0.0	12.7	0.87	0.00
3/1	05/01/10	1	56	0.0	2	30	0.69	0.99	0.0	4.0	1.010	576	6142	0.0	44.3	0.97	0.00
5/1	06/01/10	0	56	0.0	2	30	0.69	0.99	0.0	4.0	1.010	576	6999	0.0	11.0	1.00	0.00
6/1	06/11/10	0	56	22.5	3	30	0.67	0.52	22.5	1.2	1.500	855	1365	0.6	0.5	1.00	0.00
6/11	06/21/10	0	56	22.5	4	11	0.48	0.52	22.5	1.2	1.500	855	283	7.1	0.5	1.00	0.04
6/21	07/21/10	1	56	22.5	2	30	0.79	0.99	22.5	1.2	1.500	855	275	40.7	0.8	0.93	0.30
7/21	08/20/10	1	56	67.5	2	30	0.81	0.99	67.5	1.1	1.750	998	275	43.7	0.3	0.93	0.11
8/20	10/01/10	1	56	90.0	2	30	0.90	0.99	90.0	2.8	3.740	2132	275	56.9	1.0	0.95	0.53
10/1	10/07/10	1	56	0.0	2	30	0.70	0.86	0.0	3.3	1.010	576	6999	0.0	0.3	0.67	0.00
		0			2	30											
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															

Year 2

Dairy Annual Nutrient Manager

Date	11/19/2009	NM STATE UNIVERSITY Dairy Extension Program	Victor E. Cabrera Dairy Specialist dairy.nmsu.edu: Tools vcabrera@nmsu.edu	**PLANNED**		
Dairy	River Valley Dairy				**N Loss**	0%
Crop_Year	2010-2011				Goal/Real	**Nutrient Needed**
Field_ID	LAA-D					
Area (ac)	21					

	Month - Month	Crop	Unit	Yield	N	P
1st Crop	Nov'10-May'11	Wheat Silage (Wheat for green chop 70%)	t/ac	10	2943	391
2nd Crop	Jun'11-Oct 11	Corn-Field for Salage (dough 68%)	t/ac	24	3986	597
					0	0
Total		Nutrient Needed			6,929	987

				Soil Analyses	
Texture by Feel		Loam		N	P
Nutrient Available in Soil			lb/ac	50	206.55
		Nutrient Still Needed		5,879	-3,350

				Effluent Analyses	
				N	P
Effluent Manure Application		NM Dairy Ponds Net from J.S. 590 L&MLA	ac-in 3.65	1993	437
			ac-in	0	0
			ac-in	0	0
		Nutrient Still Needed		3,886	-3,787

				Manure Analyses	
				N	P
Dry Manure Application			t/ac	0	0
			t/ac	0	0
			t/ac	0	0
		Nutrient Still Needed		3,886	-3,787

				Fertilizer Content	
				N	P
Chemical Fertilizers Applied		22-0-0	lb/ac 740	3885	0
			lb/ac	0	0
			lb/ac	0	0
		Annual Nutrient Balance		1	-3,787

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:	River Valley Dairy	Acres:	21	Date:	11/11/2009	Field ID:	LAA-D

Application Information (enter the units that will be or has been applied to the field):					
Crop Rotation: Wheat Silage				Needed for field (acin):	30.66
Liquid Applied:	1.46	AcIn/ac		(gal):	832,419
Solids Applied:		ton/ac		Needed for field (tons):	
Liquid Loads Applied:		1000gal/ac		Loads needed for field:	

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:					

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Beef (DM)		0		0		0.0		0		0

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:	145.8	187.1	0.4	100	250

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (99-99.4% liq.)	99		0	42	0	33	0	17	0	68

TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
Book	Test	Book	Test	Book	Test	Book	Test
0.0		0.0		0.0		0.0	

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Wet	80 %	0 (lbs/ton) NH4-N
Liquid (type of application)	**Type of Climate**	**Percent Remaining**	**26.4** (lbs/acin) NH4-N
ace Irr w/o incorp & w/crop canopy	Warm Dry	80 %	**0.0** (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	0	0	0

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	4	13	54
	Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
	0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
<2	Well Drained	88

Summary of Nutrients

Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	26	0
P_2O_5	0.0	13	0
K_2O	0.0	54	0

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	38.7	18.5	79.5

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:	River Valley Dairy	Acres:	21	Date:	11/11/2009	Field ID:	LAA-D

Application Information (enter the units that will be or has been applied to the field):					
Crop Rotation:	Corn Silage			Needed for field (acin):	45.99
Liquid Applied:	2.19	AcIn/ac		(gal):	1,248,629
Solids Applied:		ton/ac	Needed for field (tons):		
Liquid Loads Applied:		1000gal/ac	Loads needed for field:		

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:					

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Beef (DM)		0		0		0.0		0		0

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:	145.8	187.1	0.4	100	250

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (99-99.4% liq.)	99		0	42	0	33	0	17	0	68

TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
Book	Test	Book	Test	Book	Test	Book	Test
0.0		0.0		0.0		0.0	

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Wet	80 %	0 (lbs/ton) NH4-N
Liquid (type of application)	**Type of Climate**	**Percent Remaining**	**26.4** (lbs/acin) NH4-N
ace Irr w/o incorp & w/crop canopy	Warm Dry	80 %	0.0 (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	0	0	0

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	4	13	54
	Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
	0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
<2	Well Drained	88

Summary of Nutrients

Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	26	0
P_2O_5	0.0	13	0
K_2O	0.0	54	0

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	58.0	27.7	119.3

USDA Natural Resources Conservation Service

PLANTS Crop Nutrient Tool

Nutrient Report Summary for the Crop(s) Selected

The table below summarizes the nutrients removed for the crops selected in the previous page. Crop nutrient information for individual crops follow the summary table.

Return to the crop list and make a new selection of crop(s)

Wheat, for green chop
Forage
Triticum sp.
Plant part harvested: Aboveground biomass
Crop yield unit: ton

Nutrients in harvested part (lb/ton) at 70% moisture percentage.

Nitrogen	Phosphorus	Potassium
14.0160	1.8600	

Nutrients removed in harvested part (lb/acre) at 10 ton yield level.

Nitrogen	Phosphorus	Potassium
140.1600	18.6000	

Nutrients removed in harvested part (lb/ton) at 10 ton yield level and 21 acres.

Nitrogen	Phosphorus	Potassium
2943.3600	390.6000	

Element-Fertilizer Equivalents | Average NPK Percentages

«Contents»

Intellectual Property Statement / How to Cite the PLANTS Database

Disclaimers

USDA non-discrimination policy

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Time Generated: Thur 9:32 AM - 11/19/2009

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	River Valley Dairy	Field(s):	LAA-D	Date:	Nov'11
Planner:	Chet Wyant	Location:	DonaAna	Crop:	Wheat Sil.
Soil Permeablity (in/hr):	0.3	Slope (%):	0.5	Planned/Exist.:	Planned

Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
					X	8
Phosphorus (P_2O_5) Application Rate	None Applied	<30 lbs/ac P_2O_5	30-90 lbs/ac P_2O_5	>90-150 lbs/ac P_2O_5	>150 lbs/ac P_2O_5	
		X				1
Organic Phosphorus Source Application Method	None Applied	Injected Deeper than 2 inches	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
				X		4
Phosphorus Fertilizer Application Method	None Applied	Placed with Planter Deeper than 2 in.	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
	X					0
Proximity of Nearest Field Edge to Named Stream or Lake	Very Low >1000 feet	Low >500-1000 feet	Medium >200-500 feet	High 30-200 feet	Very High <30 feet	
	X					0
Soil Erosion (wind & water)	Very Low <1 t/ac	Low 1-3 t/ac	Medium >3-5 t/ac	High >5-15 t/ac	Very High >15 t/ac	
	X					0
Runoff Class (Runoff Class Table 2)	Very Low or Negligible	Low	Medium	High	Very High	
		X				1.5
Irrigation Erosion (See QS note)	Not Irrigated or No Furrow Irrigation	Tailwater Recovery or QS<6 for very erodible soils or QS<10 for resistant soils	QS>10 for erosion resistant soils	QS>10 for erodible soils	QS>6 for very erodible soils	
			X			3
Grazing Management	Not Grazed	Graze Crop Residues	Pasture <30% Dry Matter as Supplemental Feed	Pasture 30 to 60% Dry Matter as Supplemental Feed	Pasture 60 to 100% Dry Matter as Supplemental Feed	
	X					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
		X				1.5

P Hazard Class:	Medium	Total Index Points:	19.0
Phosphorus Application Classification:	N Based		

Notes:

This evaluation has a Medium P hazard class and the nutrient application can be based on N.

Comments: Soil Erosion = (WEQ 10/10 to 5/11) 0.15 t/ac + (RUSLE 2) 0.092 t/ac = 0.24 t/ac

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	River Valley Dairy	Field(s):	LAA-C	Date:	Jun'11
Planner:	Chet Wyant	Location:	DonaAna	Crop:	Corn Sil.
Soil Permeablity (in/hr):	0.3	Slope (%):	0.5	Planned/Exist.:	Planned

Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
					X	8
Phosphorus (P_2O_5) Application Rate	None Applied	<30 lbs/ac P_2O_5	30-90 lbs/ac P_2O_5	>90-150 lbs/ac P_2O_5	>150 lbs/ac P_2O_5	
		X				1
Organic Phosphorus Source Application Method	None Applied	Injected Deeper than 2 inches	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
				X		4
Phosphorus Fertilizer Application Method	None Applied	Placed with Planter Deeper than 2 in.	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
	X					0
Proximity of Nearest Field Edge to Named Stream or Lake	Very Low >1000 feet	Low >500-1000 feet	Medium >200-500 feet	High 30-200 feet	Very High <30 feet	
	X					0
Soil Erosion (wind & water)	Very Low <1 t/ac	Low 1-3 t/ac	Medium >3-5 t/ac	High >5-15 t/ac	Very High >15 t/ac	
		X				1.5
Runoff Class (Runoff Class Table 2)	Very Low or Negligible	Low	Medium	High	Very High	
		x				1.5
Irrigation Erosion (See QS note)	Not Irrigated or No Furrow Irrigation	Tailwater Recovery or QS<6 for very erodible soils or QS<10 for resistant soils	QS>10 for erosion resistant soils	QS>10 for erodible soils	QS>6 for very erodible soils	
			X			3
Grazing Management	Not Grazed	Graze Crop Residues	Pasture <30% Dry Matter as Supplemental Feed	Pasture 30 to 80% Dry Matter as Supplemental Feed	Pasture 80 to 100% Dry Matter as Supplemental Feed	
	X					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
		X				1.5

P Hazard Class:	Medium	Total Index Points:	20.5
Phosphorus Application Classification:	N Based		

Notes:

This evaluation has a Medium P hazard class and the nutrient application can be based on N.

Comments: Soil Erosion = (WEQ 6/11 to 10/11) 0.14 t/ac + (RUSLE 2) 0.088 t/ac = 0.23 t/ac

NRCS Natural Resources Conservation Service

Irrigation Water Management

Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: River Valley Dairy **Tract:** 735
Planner: Chet Wyant **Field(s) No.:** LAA-D
Current Land Use: Wheat Silage/ Corn Silage **Total Acres:** 21
Date: 11/19/2009 **Date to apply:** 11/1/2010

See the Conservation Plan map for the location of the field(s) to applying IWM.

Purposes (check all that apply)

- ☐ Manage soil moisture to improve crops
- ☑ Optimize use of water
- ☑ Minimize Irrigation Erosion
- ☐ Decrease non-point source pollution
- ☐ Manage salt in the root zone
- ☐ Manage air, soil, or plant microclimate

Conditions where practice applies

This practice is applicable to all irrigated lands. An irrigation system adapted for the site conditions is available and capable of applying water to meet the intended purpose(s).

Soil (Series, Texture, and Map Unit) *Select the soil to manage for:*

Critical soil to manage:	**Glendale CL, Mimbres soils, Stellar SICL; 22-37, 221**	Intake Family (in/hr):	**0.30**

Soil Interpretations for Irrigaiton

Crop Name	Rooting Depth	Moisture Replacement Depth (ft)	Water Holding Capacity (in)	Mgt Allowed Depletion (MAD) (%)	Net Water to Replace (in)	Time Needed to Infiltrate (hrs)
Wheat, winter, silage; Las Cruces	Medium	3.0	6.0	50%	3.0	6.3
Corn, silage; Las Cruces	Medium	3.0	6.0	50%	3.0	6.3

Crop Consumptive Use (CU) Information *(inches/month needed)*

Crop:	Wheat, winter, silage; Las Cruces		Total Irrigation Needed:	10.2 ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan	>1 Mo.	1.2	Jul		0.0
Feb	>1 Mo.	2.1	Aug		0.0
Mar	27	3.3	Sep	>1 Mo.	0.3
Apr		0.0	Oct	>1 Mo.	1.3
May		0.0	Nov	>1 Mo.	1.2
Jun		0.0	Dec	>1 Mo.	0.9

Crop:	Corn, silage; Las Cruces		Total Irrigation Needed:	29.3 ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan		0.0	Jul	10	9.4
Feb		0.0	Aug	14	6.6
Mar		0.0	Sep		0.0
Apr	>1 Mo.	1.2	Oct		0.0
May	22	4.2	Nov		0.0
Jun	11	7.9	Dec		0.0

Crop:			Total Irrigation Needed:		ac in/ac
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** (days between irr.)	**In/Mo**
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Crop:			Total Irrigation Needed:		ac in/ac
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Farm Irrigation Rating System (FIRS, irrigation system efficiency)

Type of System: **Flood, controlled** System Efficiency (%): **80%**

System Capacity (Ditch/Pump/Well): **1400** GPM

Crop Grown	Days of Operation for CU by crop (days)	Est. System Application Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Wheat, winter, silage; Las Cruces	4	2.84	0.11	System meets CU for crop
Corn, silage; Las Cruces	10	2.84	0.31	System meets CU for crop

Operation and Maintenance Requirements

1. Irrigate when the soils reaches the MAD level, determined by soil moisture monitoring. Use one of the following methods to monitor soil moisture; the feel method, tensiometers, electrical resistance blocks, or moisture probes. Drip or Center Pivots can be irrigated on an as needed basis to meet daily CU.

2. Test irrigation water for Nitrate and Salts (Total Desolved Solids/Electrical Conductivity)

3. Do not exceed the net water to replace listed above when irrigating, unless salts are being managed.

4. Do not apply water at rates that cause runoff or erosion.

5. Monitor the soil to maintain: pH, permeability, salinity, and structure.

6. Application of pond effluent shall not exceed the crop needs (water and nutrient), and will not exceed the water holding capacity listed above.

7. Consider using crops such as sorghum, cotton, or winter wheat when water supplies are short.

8. Avoid traffic on wet soils to minimize soil compaction.

Additional Requirements

Job Approval and Completion

Client: _____ **Date:** 11-23-09

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

USDA NRCS Natural Resources Conservation Service

RUSLE2 Worksheet Erosion Calculation Record

Info: Nov'10-May'11 Wheat Silage, Jun'11-Oct'11 Corn Silage

Tract #: 735
Owner name: River Valley Dairy
Field name: LAA-D

Location: New Mexico\DonaAna County\NM_Dona Ana R 9
Soil: Gf GLENDALE CLAY LOAM\GLENDALE clay loam 85%
Slope length (horiz): 100.0 ft
Avg. slope steepness: 0.50 %
T value: 5.0 t/ac/yr

Alternatives:

Management	*Contouring*	*Strips / barriers*	*Diversion/terrace, sediment basin*	*Cons. plan. soil loss, t/ac/yr*	*Description*
a.Single Year/Single Crop Templates\WWheat, silage, plow, irr CT	b. absolute row grade 0.5 percent	(none)	(none)	0.092	
a.Single Year/Single Crop Templates\Corn, silage, plow	b. absolute row grade 0.5 percent	(none)	(none)	0.088	

NRCS - WEQ CALCULATIONS

Version 9 03 11-19-2007

Producer:	River Valley Dairy	Planner:	Chet Wyant	Location:	Anthony, NM	Tract:	735	Field:	LAA-D
Crop Rotation:	Winter Wheat Silage/Corn Silage	Climate Data Station:	NM, LAS CRUCES					Site "C" Value:	150
Tillage Direction (NS/EW):	NS	Length/width ratio:	4	Field Direction (NS/EW):	NS			Field Width (Ft.):	570
Irrigation (Y or N):	Y	Soil "I":	86	Wind Erodibility Group:	4L	(1-7)		TWF:	2 (see instr.)
Sum Period Erosion (t/ac):	0.3			No. Yrs in Rotation:	1.1			Av. Annual Wind Erosion:	0.3 (t/ac/yr)

Calculations and Output

Mgt Periods		Irr.	Soil	Ridge Roughness				Random Roughness	Unsheltered Distance				SGe	Erosion			
Dates		No. of	"I"	Dev.	Ht.	Sp.	"Krd"	"Kr"	Dev.	Prep.	WED	"L"	"V"	"E"	EWE	"IF"	Loss
Begin	End	(#)	(t/ac)	(deg)	(in.)	(in.)	(factor)	(factor)	(deg)	(factor)	(factor)	(ft)	(lbs/ac)	(t/ac)	(%)	(%)	(t/ac)
10/1	11/02/10	0	56	0.0	2	10	0.46	0.99	0.0	3.3	1.010	576	5317	0.0	1.5	1.00	0.00
11/2	11/17/10	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	2.5	0.87	0.00
11/17	12/02/10	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	2.5	0.87	0.00
12/2	12/17/10	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	3.7	0.87	0.00
12/17	01/01/11	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	3.7	0.87	0.00
1/1	01/16/11	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	2.0	0.87	0.00
1/16	05/15/11	4	56	0.0	2	10	0.44	0.99	0.0	4.0	1.010	576	1667	0.1	75.1	0.93	0.08
5/15	05/22/11	0	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	4282	0.0	2.5	1.00	0.00
5/22	05/29/11	0	56	0.0	3	30	0.50	0.52	0.0	4.0	1.010	576	1473	0.0	2.5	1.00	0.00
5/29	06/29/11	0	56	0.0	4	11	0.22	0.68	0.0	4.0	1.010	576	210	2.8	2.6	1.00	0.07
6/29	07/14/11	0	56	22.5	2	10	0.62	0.86	22.5	1.2	1.500	855	159	26.8	0.3	1.00	0.07
7/14	07/29/11	1	56	67.5	2	10	0.65	0.86	67.5	1.1	1.750	998	163	30.1	0.2	0.87	0.05
7/29	08/13/11	1	56	67.5	2	10	0.65	0.86	67.5	1.1	1.750	998	658	16.9	0.1	0.87	0.02
8/13	08/28/11	1	56	90.0	2	10	0.81	0.86	90.0	2.8	3.740	2132	1551	2.9	0.1	0.87	0.00
8/28	09/12/11	1	56	90.0	2	10	0.81	0.86	90.0	2.8	3.740	2132	5336	0.0	0.4	0.87	0.00
9/12	10/01/11	1	56	0.0	2	10	0.44	0.99	0.0	4.0	1.010	576	6999	0.0	0.6	0.89	0.00
10/1	11/01/11	0	56	0.0	2	10	0.46	0.99	0.0	3.3	1.010	576	5317	0.0	1.3	1.00	0.00
		0			2	10											
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															

Year 3

Dairy Annual Nutrient Manager

Date	11/19/2009	NM STATE UNIVERSITY Dairy Extension Program	Victor E. Cabrera Dairy Specialist dairy.nmsu.edu: Tools vcabrera@nmsu.edu	**PLANNED**		
Dairy	River Valley Dairy				N Loss	0%
Crop_Year	2011-2012				Goal/Real	**Nutrient Needed**
Field_ID	LAA-D					
Area (ac)	21					
	Month - Month	Crop	Unit		Yield	N	P
1st Crop	Nov'11-May'12	Barley-6 row, for green cut (boot 69%)	t/ac		10	2870	482
2nd Crop	Jun'12-Oct'12	Corn-Field for Salage (dough 68%)	t/ac		24	3986	597
						0	0
Total		Nutrient Needed				6,856	1,079
						Soil Analyses	
Texture by Feel		Loam				N	P
Nutrient Available in Soil			lb/ac			50	206.55
		Nutrient Still Needed				5,806	-3,259
						Effluent Analyses	
						N	P
Effluent Manure Application		NM Dairy Ponds Net from J.S. 590 L&MLA	ac-in		3.65	1993	437
			ac-in			0	0
			ac-in			0	0
		Nutrient Still Needed				3,813	-3,696
						Manure Analyses	
						N	P
Dry Manure Application			t/ac			0	0
			t/ac			0	0
			t/ac			0	0
		Nutrient Still Needed				3,813	-3,696
						Fertilizer Content	
						N	P
Chemical Fertilizers Applied		22-0-0	lb/ac		726	3812	0
			lb/ac			0	0
			lb/ac			0	0
		Annual Nutrient Balance				**2**	**-3,696**

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:	River Valley Dairy	Acres:	21	Date:	11/11/2009	Field ID:	LAA-D

Application Information (enter the units that will be or has been applied to the field):					
Crop Rotation: Barley Silage				Needed for field (acin):	30.66
Liquid Applied:	1.46	AcIn/ac		(gal):	832,419
Solids Applied:		ton/ac		Needed for field (tons):	
Liquid Loads Applied:		1000gal/ac		Loads needed for field:	

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:					

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Beef (DM)		0		0		0.0		0		0

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:	145.8	187.1	0.4	100	250

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (99-99.4% liq.)	99		0	42	0	33	0	17	0	68

TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
Book	Test	Book	Test	Book	Test	Book	Test
0.0		0.0		0.0		0.0	

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Wet	80 %	0 (lbs/ton) NH4-N
Liquid (type of application)	**Type of Climate**	**Percent Remaining**	**26.4** (lbs/acin) NH4-N
...race Irr w/o incorp & w/crop canopy	Warm Dry	80 %	0.0 (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	0	0	0

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	4	13	54
	Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
	0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
<2	Well Drained	88

Summary of Nutrients

Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	26	0
P_2O_5	0.0	13	0
K_2O	0.0	54	0

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	38.7	18.5	79.5

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:	River Valley Dairy	Acres:	21	Date:	11/11/2009	Field ID:	LAA-D

Application information (enter the units that will be or has been applied to the field):					
Crop Rotation: Corn Silage				Needed for field (acin):	45.99
Liquid Applied:	2.19	AcIn/ac		(gal):	1,248,629
Solids Applied:		ton/ac		Needed for field (tons):	
Liquid Loads Applied:		1000gal/ac		Loads needed for field:	

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:					

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Beef (DM)		0		0		0.0		0		0

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:	145.8	187.1	0.4	100	250

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (99-99.4% liq.)	99		0	42	0	33	0	17	0	68

TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
Book	Test	Book	Test	Book	Test	Book	Test
0.0		0.0		0.0		0.0	

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Wet	80 %	0 (lbs/ton) NH4-N
Liquid (type of application)	**Type of Climate**	**Percent Remaining**	**NH_4-N Remaining**
ace Irr w/o incorp & w/crop canopy	Warm Dry	80 %	0.0 (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	0	0	0

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	4	13	54
	Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
	0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
<2	Well Drained	88

Summary of Nutrients

Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	26	0
P_2O_5	0.0	13	0
K_2O	0.0	54	0

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	58.0	27.7	119.3

USDA Natural Resources Conservation Service
PLANTS

Nutrient Report Summary for the Crop(s) Selected

The table below summarizes the nutrients removed for the crops selected in the previous page. Crop nutrient information for individual crops follow the summary table.

Return to the crop list and make a new selection of crop(s)

Barley-6 row, for green chop (boot)
Forage
Hordeum vulgare
Plant part harvested: Aboveground biomass
Crop yield unit: ton

Nutrients in harvested part (lb/ton) at 69% moisture percentage.

Nitrogen	Phosphorus	Potassium
13.6688	2.2951	9.7854

Nutrients removed in harvested part (lb/acre) at 10 ton yield level.

Nitrogen	Phosphorus	Potassium
136.6882	22.9512	97.8539

Nutrients removed in harvested part (lb/ton) at 10 ton yield level and 21 acres.

Nitrogen	Phosphorus	Potassium
2870.4525	481.9746	2054.9314

Element-Fertilizer Equivalents | Average NPK Percentages

«Contents»

Intellectual Property Statement / How to Cite the PLANTS Database
Disclaimers
USDA non-discrimination policy

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Time Generated: Thur 9:49 AM - 11/19/2009

USDA Natural Resources Conservation Service
PLANTS
Crop Nutrient Tool

Nutrient Report Summary for the Crop(s) Selected

The table below summarizes the nutrients removed for the crops selected in the previous page. Crop nutrient information for individual crops follow the summary table.

Return to the crop list and make a new selection of crop(s)

Corn-Field, for silage (dough stage)
Forage
Zea mays ssp. mays
Plant part harvested: Aboveground biomass
Crop yield unit: ton

Nutrients in harvested part (lb/ton) at 68% moisture percentage.

Nitrogen	Phosphorus	Potassium
7.9078	1.1840	6.6560

Nutrients removed in harvested part (lb/acre) at 24 ton yield level.

Nitrogen	Phosphorus	Potassium
189.7882	28.4160	159.7440

Nutrients removed in harvested part (lb/ton) at 24 ton yield level and 21 acres.

Nitrogen	Phosphorus	Potassium
3985.5514	596.7360	3354.6240

Element-Fertilizer Equivalents | Average NPK Percentages

«Contents»

Intellectual Property Statement / How to Cite the PLANTS Database
Disclaimers
USDA non-discrimination policy

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Time Generated: Thur 9:45 AM - 11/19/2009

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	River Valley Dairy	Field(s):	LAA-D	Date:	Nov'11
Planner:	Chet Wyant	Location:	DonaAna	Crop:	Barley Sil.
Soil Permeablity (in/hr):	0.3	Slope (%):	0.5	Planned/Exist.:	Planned

Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
					X	8
Phosphorus (P_2O_5) Application Rate	None Applied	<30 lbs/ac P_2O_5	30-90 lbs/ac P_2O_5	>90-150 lbs/ac P_2O_5	>150 lbs/ac P_2O_5	
		X				1
Organic Phosphorus Source Application Method	None Applied	Injected Deeper than 2 inches	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
				X		4
Phosphorus Fertilizer Application Method	None Applied	Placed with Planter Deeper than 2 in.	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
	X					0
Proximity of Nearest Field Edge to Named Stream or Lake	Very Low >1000 feet	Low >500-1000 feet	Medium >200-500 feet	High 30-200 feet	Very High <30 feet	
	X					0
Soil Erosion (wind & water)	Very Low <1 t/ac	Low 1-3 t/ac	Medium >3-5 t/ac	High >5-15 t/ac	Very High >15 t/ac	
	X					0
Runoff Class (Runoff Class Table 2)	Very Low or Negligible	Low	Medium	High	Very High	
		x				1.5
Irrigation Erosion (See QS note)	Not Irrigated or No Furrow Irrigation	Tailwater Recovery or QS<6 for very erodible soils or QS<10 for resistant soils	QS>10 for erosion resistant soils	QS>10 for erodible soils	QS>6 for very erodible soils	
			X			3
Grazing Management	Not Grazed	Graze Crop Residues	Pasture <30% Dry Matter as Supplemental Feed	Pasture 30 to 60% Dry Matter as Supplemental Feed	Pasture 60 to 100% Dry Matter as Supplemental Feed	
	X					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
		X				1.5

P Hazard Class:	Medium	Total Index Points:	19.0
Phosphorus Application Classification:	N Based		

Notes:

This evaluation has a Medium P hazard class and the nutrient application can be based on N.

Comments: Soil Erosion = (WEQ 10/11 to 5/12) 0.15 t/ac + (RUSLE 2) 0.092 t/ac = 0.24 t/ac

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	River Valley Dairy	Field(s):	LAA-D	Date:	Jun'12
Planner:	Chet Wyant	Location:	DonaAna	Crop:	Corn Sil.
Soil Permeablity (in/hr):	0.3	Slope (%):	0.5	Planned/Exist.:	Planned

Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
					X	8
Phosphorus (P_2O_5) Application Rate	None Applied	<30 lbs/ac P_2O_5	30-90 lbs/ac P_2O_5	>90-150 lbs/ac P_2O_5	>150 lbs/ac P_2O_5	
		X				1
Organic Phosphorus Source Application Method	None Applied	Injected Deeper than 2 inches	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
				X		4
Phosphorus Fertilizer Application Method	None Applied	Placed with Planter Deeper than 2 in.	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
	X					0
Proximity of Nearest Field Edge to Named Stream or Lake	Very Low >1000 feet	Low >500-1000 feet	Medium >200-500 feet	High 30-200 feet	Very High <30 feet	
	X					0
Soil Erosion (wind & water)	Very Low <1 t/ac	Low 1-3 t/ac	Medium >3-5 t/ac	High >5-15 t/ac	Very High >15 t/ac	
	X					0
Runoff Class (Runoff Class Table 2)	Very Low or Negligible	Low	Medium	High	Very High	
		x				1.5
Irrigation Erosion (See QS note)	Not Irrigated or No Furrow Irrigation	Tailwater Recovery or QS<6 for very erodible soils or QS<10 for resistant soils	QS>10 for erosion resistant soils	QS>10 for erodible soils	QS>6 for very erodible soils	
			X			3
Grazing Management	Not Grazed	Graze Crop Residues	Pasture <30% Dry Matter as Supplemental Feed	Pasture 30 to 60% Dry Matter as Supplemental Feed	Pasture 60 to 100% Dry Matter as Supplemental Feed	
	X					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
		X				1.5

P Hazard Class:	Medium	Total Index Points:	19.0
Phosphorus Application Classification:	N Based		

Notes:

This evaluation has a Medium P hazard class and the nutrient application can be based on N.

Comments: Soil Erosion = (WEQ 6/12 to 10/12) 0.14 t/ac + (RUSLE 2) 0.088 t/ac = 0.23 t/ac

NRCS Natural Resources Conservation Service

Irrigation Water Management

Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: River Valley Dairy **Tract:** 735

Planner: Chet Wyant **Field(s) No.:** LAA-D

Current Land Use: Barley Silage/ Corn Silage **Total Acres:** 21

Date: 11/19/2009 **Date to apply:** 11/1/2011

See the Conservation Plan map for the location of the field(s) to applying IWM.

Purposes (check all that apply)

- ☐ Manage soil moisture to improve crops
- ☑ Optimize use of water
- ☑ Minimize Irrigation Erosion
- ☐ Decrease non-point source pollution
- ☐ Manage salt in the root zone
- ☐ Manage air, soil, or plant microclimate

Conditions where practice applies

This practice is applicable to all irrigated lands. An irrigation system adapted for the site conditions is available and capable of applying water to meet the intended purpose(s).

Soil (Series, Texture, and Map Unit) *Select the soil to manage for:*

Critical soil to manage:	**Glendale CL, Mimbres soils, Stellar SICL; 22-37, 221**	Intake Family (in/hr):	**0.30**

Soil Interpretations for Irrigaiton

Crop Name	Rooting Depth	Moisture Replacement Depth (ft)	Water Holding Capacity (in)	Mgt Allowed Depletion (MAD) (%)	Net Water to Replace (in)	Time Needed to Infiltrate (hrs)
Wheat, winter, silage; Las Cruces	Medium	3.0	6.0	50%	3.0	6.3
Corn, silage; Las Cruces	Medium	3.0	6.0	50%	3.0	6.3

Crop Consumptive Use (CU) Information *(inches/month needed)*

Crop:	Wheat, winter, silage; Las Cruces		**Total Irrigation Needed:**	10.2 ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan	>1 Mo.	1.2	**Jul**		0.0
Feb	>1 Mo.	2.1	**Aug**		0.0
Mar	27	3.3	**Sep**	>1 Mo.	0.3
Apr		0.0	**Oct**	>1 Mo.	1.3
May		0.0	**Nov**	>1 Mo.	1.2
Jun		0.0	**Dec**	>1 Mo.	0.9

Crop:	Corn, silage; Las Cruces		**Total Irrigation Needed:**	29.3 ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan		0.0	**Jul**	10	9.4
Feb		0.0	**Aug**	14	6.6
Mar		0.0	**Sep**		0.0
Apr	>1 Mo.	1.2	**Oct**		0.0
May	22	4.2	**Nov**		0.0
Jun	11	7.9	**Dec**		0.0

Crop:			Total Irrigation Needed:	ac in/ac	
Month	Est. Frequency (days between irr.)	In/Mo	Month	Est. Frequency (days between irr.)	In/Mo
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Crop:			Total Irrigation Needed:	ac in/ac	
Month	Est. Frequency (days between irr.)	In/Mo	Month	Est. Frequency (days between irr.)	In/Mo
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Farm Irrigation Rating System (FIRS, irrigation system efficiency)

Type of System: **Flood, controlled** System Efficiency (%): **80%**

System Capacity (Ditch/Pump/Well): **1400** GPM

Crop Grown	Days of Operation for CU by crop (days)	Est. System Application Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Wheat, winter, silage; Las Cruces	4	2.84	0.11	System meets CU for crop
Corn, silage; Las Cruces	10	2.84	0.31	System meets CU for crop

Operation and Maintenance Requirements

1. Irrigate when the soils reaches the MAD level, determined by soil moisture monitoring. Use one of the following methods to monitor soil moisture; the feel method, tensiometers, electrical resistance blocks, or moisture probes. Drip or Center Pivots can be irrigated on an as needed basis to meet daily CU.

2. Test irrigation water for Nitrate and Salts (Total Desolved Solids/Electrical Conductivity)

3. Do not exceed the net water to replace listed above when irrigating, unless salts are being managed.

4. Do not apply water at rates that cause runoff or erosion.

5. Monitor the soil to maintain: pH, permeability, salinity, and structure.

6. Application of pond effluent shall not exceed the crop needs (water and nutrient), and will not exceed the water holding capacity listed above.

7. Consider using crops such as sorghum, cotton, or winter wheat when water supplies are short.

8. Avoid traffic on wet soils to minimize soil compaction.

Additional Requirements

Job Approval and Completion

Client: R Bonnet **Date:** 11-23-09

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

USL NRCS Natural Resources Conservation Service

RUSLE2 Worksheet Erosion Calculation Record

Info: Nov'11-May'12 Barley Silage, Jun'12-Oct'12 Corn Silage

Tract #: 735
Owner name: River Valley Dairy
Field name: LAA-D

Location: New Mexico\DonaAna County\NM_Dona Ana R 9
Soil: Gf GLENDALE CLAY LOAM\GLENDALE clay loam 85%
Slope length (horiz): 100.0 ft
Avg. slope steepness: 0.50 %
T value: 5.0 t/ac/yr

Alternatives:

Management	*Contouring*	*Strips / barriers*	*Diversion/terrace, sediment basin*	*Cons. plan. soil loss, t/ac/yr*	*Description*
a.Single Year/Single Crop Templates\WWheat, silage, plow, irr CT	b. absolute row grade 0.5 percent	(none)	(none)	0.092	
a.Single Year/Single Crop Templates\Corn, silage, plow	b. absolute row grade 0.5 percent	(none)	(none)	0.088	

Used Wheat Silage for Barley Silage

NRCS - WEQ CALCULATIONS

Version 9.03 11-19-2007

Producer:	River Valley Dairy	Planner:	Chet Wyant	Location:	Anthony, NM	Tract:	735	Field:	LAA-D		
Crop Rotation:	Barley Silage/Corn Silage	Climate Data Station:	NM, LAS CRUCES					Site "C" Value:	150		
Tillage Direction (NS/EW):	NS	Length/width ratio:	4	Field Direction (NS/EW):	NS			Field Width (Ft.):	570		
Irrigation (Y or N):	Y	Soil "I":	86	Wind Erodibility Group:	4L	(1-7)		TWF:	2	(see instr.)	
Sum Period Erosion (t/ac):	0.3			No. Yrs in Rotation:	1.1			Av. Annual Wind Erosion:	0.3	(t/ac/yr)	

Calculations and Output

Mgt Periods		Irr.	Soil	Ridge Roughness				Random Roughness	Unsheltered Distance				SGe	Erosion			
Dates		No. of	"I"	Dev.	Ht.	Sp.	"Krd"	"Krr"	Dev.	Prep.	WED	"L"	"V"	"E"	EWE	"IF"	Loss
Begin	End	(#)	(t/ac)	(deg)	(in.)	(in.)	(factor)	(factor)	(deg)	(factor)	(factor)	(ft)	(lbs/ac)	(t/ac)	(%)	(%)	(t/ac)
10/1	11/02/11	0	56	0.0	2	10	0.46	0.99	0.0	3.3	1.010	576	5317	0.0	1.5	1.00	0.00
11/2	11/17/11	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	2.5	0.87	0.00
11/17	12/02/11	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	2.5	0.87	0.00
12/2	12/17/11	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	3.7	0.87	0.00
12/17	01/01/12	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	3.7	0.87	0.00
1/1	01/16/12	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1667	0.0	2.0	0.87	0.00
1/16	05/15/12	4	56	0.0	2	10	0.44	0.99	0.0	4.0	1.010	576	1667	0.1	75.1	0.93	0.08
5/15	05/22/12	0	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	4282	0.0	2.5	1.00	0.00
5/22	05/29/12	0	56	0.0	3	30	0.50	0.52	0.0	4.0	1.010	576	1473	0.0	2.5	1.00	0.00
5/29	06/29/12	0	56	0.0	4	11	0.22	0.68	0.0	4.0	1.010	576	210	2.8	2.6	1.00	0.07
6/29	07/14/12	0	56	22.5	2	10	0.62	0.86	22.5	1.2	1.500	855	159	26.8	0.3	1.00	0.07
7/14	07/29/12	1	56	67.5	2	10	0.65	0.86	67.5	1.1	1.750	998	163	30.1	0.2	0.87	0.05
7/29	08/13/12	1	56	67.5	2	10	0.65	0.86	67.5	1.1	1.750	998	658	16.9	0.1	0.87	0.02
8/13	08/28/12	1	56	90.0	2	10	0.81	0.86	90.0	2.8	3.740	2132	1551	2.9	0.1	0.87	0.00
8/28	09/12/12	1	56	90.0	2	10	0.81	0.86	90.0	2.8	3.740	2132	5336	0.0	0.4	0.87	0.00
9/12	10/01/12	1	56	0.0	2	10	0.44	0.99	0.0	4.0	1.010	576	6999	0.0	0.6	0.89	0.00
10/1	11/01/12	0	56	0.0	2	10	0.46	0.99	0.0	3.3	1.010	576	5317	0.0	1.3	1.00	0.00
		0			2	10											
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															

Year 4

Dairy Annual Nutrient Manager

Date	11/19/2009	NM STATE UNIVERSITY Dairy Extension Program	Victor E. Cabrera Dairy Specialist dairy.nmsu.edu: Tools vcabrera@nmsu.edu	PLANNED		
Dairy	River Valley Dairy				N Loss	0%
Crop_Year	2012-2013				Goal/Real	Nutrient Needed
Field_ID	LAA-D					
Area (ac)	21					
	Month - Month	Crop	Unit	Yield	N	P
1st Crop	Nov'12-May'13	Oats for green chop (boot to early bloom 69%)	t/ac	10	4727	882
2nd Crop	Jun'13 - Oct'13	Sorghum/Sudangrass, for silage (70%)	t/ac	16	3302	423
					0	0
Total		Nutrient Needed			8,029	1,306
					Soil Analyses	
Texture by Feel		Loam			N	P
Nutrient Available in Soil			lb/ac		50	206.55
		Nutrient Still Needed			6,979	-3,032
					Effluent Analyses	
					N	P
Effluent Manure Application		NM Dairy Ponds Net from J.S. 590 L&MLA	ac-in	3.65	1993	437
			ac-in		0	0
			ac-in		0	0
		Nutrient Still Needed			4,986	-3,469
					Manure Analyses	
					N	P
Dry Manure Application		NM Dairy Cattle Net from J.S. 590 L&MLA	t/ac	21.58	4985	3168
			t/ac		0	0
			t/ac		0	0
		Nutrient Still Needed			1	-6,636
					Fertilizer Content	
					N	P
Chemical Fertilizers Applied			lb/ac		0	0
			lb/ac		0	0
			lb/ac		0	0
		Annual Nutrient Balance			**1**	**-6,636**

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:	River Valley Dairy	Acres:	21	Date:	11/11/2009	Field ID:	LAA-D

Application Information (enter the units that will be or has been applied to the field):					
Crop Rotation: Oats Silage				Needed for field (acin):	30.66
Liquid Applied:	1.46	AcIn/ac		(gal):	832,419
Solids Applied:	21.58	ton/ac		Needed for field (tons):	453.18
Liquid Loads Applied:		1000gal/ac		Loads needed for field:	

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:	11.51	2.0		1.2	3.1

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Dairy Cattle (30% wet wt) NM (Aver		12	0	35	0.4	0.0	0	21	0	54

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:	145.8	187.1	0.4	100	250

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (99-99.4% liq.)	99		0	42	0	33	0	17	0	68

TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
Book	Test	Book	Test	Book	Test	Book	Test
0.0		0.0		0.0		0.0	

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Dry	60 %	0 (lbs/ton) NH4-N
Liquid (type of application)	**Type of Climate**	**Percent Remaining**	**26.4** (lbs/acin) NH4-N
Surface Irr w/o incorp & w/crop canopy	Warm Dry	80 %	0.0 (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	12	16	43

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	4	13	54
	Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
	0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
<2	Well Drained	88

Summary of Nutrients

Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	26	11
P_2O_5	0.0	13	16
K_2O	0.0	54	43

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	270.9	365.1	1014.5

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:	River Valley Dairy	Acres:	21	Date:	11/11/2009	Field ID:	LAA-D

Application Information (*enter the units that will be or has been applied to the field*):

Crop Rotation:	Sudangrass Silage			Needed for field (acin):	45.99
Liquid Applied:	2.19	AcIn/ac		(gal):	1,248,629
Solids Applied:		ton/ac	Needed for field (tons):		
Liquid Loads Applied:		1000gal/ac	Loads needed for field:		

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:					

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Beef (DM)		0		0		0.0		0		0

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:	145.8	187.1	0.4	100	250

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (99-99.4% liq.)	99		0	42	0	33	0	17	0	68

TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
Book	Test	Book	Test	Book	Test	Book	Test
0.0		0.0		0.0		0.0	

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Wet	80 %	0 (lbs/ton) NH4-N

Liquid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Surface Irr w/o incorp & w/crop canopy	Warm Dry	80 %	0.0 (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	0	0	0

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	4	13	54

Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
<2	Well Drained	88

Summary of Nutrients

Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	26	0
P_2O_5	0.0	13	0
K_2O	0.0	54	0

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	58.0	27.7	119.3

Dairy Annual Nutrient Manager

Date	6/28/2010	NM STATE UNIVERSITY Dairy Extension Program	Victor E. Cabrera Dairy Specialist dairy.nmsu.edu: Tools vcabrera@nmsu.edu	PLANNED		
Dairy	River Valley Dairy				N Loss	0%
Crop_Year	2012-2013				Goal/Real	Nutrient Needed
Field_ID	LAA-D					
Area (ac)	21					
	Month - Month	Crop	Unit	Yield	N	P
1st Crop	Nov'12-May'13	Oats for green chop (boot to early bloom 69%)	t/ac	10	4727	882
2nd Crop	Jun'13 - Oct'13	Sorghum grain (moisture 11.18%)	bu/ac	107	2087	372
					0	0
Total		Nutrient Needed			6,814	1,254
					Soil Analyses	
Texture by Feel		Loam			N	P
Nutrient Available in Soil			lb/ac		50	206.55
		Nutrient Still Needed			5,764	-3,083
					Effluent Analyses	
					N	P
Effluent Manure Application		NM Dairy Ponds Net from J.S. 590 L&MLA	ac-in	3.65	1993	437
		Irrigation	ac-in	36	685	0
			ac-in		0	0
		Nutrient Still Needed			3,086	-3,520
					Manure Analyses	
					N	P
Dry Manure Application		NM Dairy Cattle Net from J.S. 590 L&MLA	t/ac	13.35	3084	1960
			t/ac		0	0
			t/ac		0	0
		Nutrient Still Needed			2	-5,480
					Fertilizer Content	
					N	P
Chemical Fertilizers Applied			lb/ac		0	0
			lb/ac		0	0
			lb/ac		0	0
		Annual Nutrient Balance			**2**	**-5,480**

Search
Name Search

Scientific Name Go
State Search
Advanced Search
Search Help

PLANTS Topics
Alternative Crops
Characteristics
Classification
Culturally Significant
Distribution Update
Fact Sheets & Plant Guides
Invasive and Noxious Weeds
Links
Plant Materials Publications
Threatened & Endangered
Wetland Indicator Status

Image Gallery
40,000+ Plant Images
Submit Your Digital Images

Download
Complete PLANTS Checklist
State PLANTS Checklist
Advanced Search Download
Symbols for Unknown Plants
NRCS State GSAT Lists
NRCS State Plants Lists
PLANTS Posters

Related Tools
Crop Nutrient Tool
Ecological Site Information System
PLANTS Identification Keys
Plant Materials Web Site
Other NRCS Tech Resources

Crop Nutrient Results

Select Crops
About the Crop Nutrient Tool
Nutrient Data Sources
Download Crop Nutrient Database

Nutrient Details

The following is a detailed list of nutrient information based on each specific crop type chosen.

Sorghum, for grain

Crop type:	Cereal and oil
Scientific name:	Sorghum bicolor
Crop yield unit:	bu
Harvested plant part:	Caryopsis

Nutrients in harvested part (lb/bu) at 11.18% moisture percentage.

Nitrogen	Phosphorus	Potassium
0.9288	0.1655	0.1924

Nutrients removed in harvested part (lb/acre) at 107.0 bu yield level.

Nitrogen	Phosphorus	Potassium
99.3836	17.7086	20.5824

Element-Fertilizer Equivalents | Average NPK Percentages

USDA Natural Resources Conservation Service
PLANTS

Nutrient Report Summary for the Crop(s) Selected

The table below summarizes the nutrients removed for the crops selected in the previous page. Crop nutrient information for individual crops follow the summary table.

Return to the crop list and make a new selection of crop(s)

Oat, for green chop (boot to early bloom)
Forage
Avena sativa
Plant part harvested: Aboveground biomass
Crop yield unit: ton

Nutrients in harvested part (lb/ton) at 69% moisture percentage.

Nitrogen	Phosphorus	Potassium
12.2508	2.1046	11.6554

Nutrients removed in harvested part (lb/acre) at 10 ton yield level.

Nitrogen	Phosphorus	Potassium
122.5083	21.0458	116.5538

Nutrients removed in harvested part (lb/ton) at 10 ton yield level and 21 acres.

Nitrogen	Phosphorus	Potassium
2572.6737	441.9621	2447.6295

Element-Fertilizer Equivalents | Average NPK Percentages

«Contents»

Intellectual Property Statement / How to Cite the PLANTS Database
Disclaimers
USDA non-discrimination policy

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Time Generated: Thur 10:06 AM - 11/19/2009

USDA Natural Resources Conservation Service
PLANTS

Nutrient Report Summary for the Crop(s) Selected

The table below summarizes the nutrients removed for the crops selected in the previous page. Crop nutrient information for individual crops follow the summary table.

Return to the crop list and make a new selection of crop(s)

Sorghum/Sudangrass, for silage
Forage
Sorghum bicolor ssp. drummondii
Plant part harvested: Aboveground biomass
Crop yield unit: ton

Nutrients in harvested part (lb/ton) at 70% moisture percentage.

Nitrogen	Phosphorus	Potassium
9.8280	1.2600	15.6600

Nutrients removed in harvested part (lb/acre) at 10 ton yield level.

Nitrogen	Phosphorus	Potassium
98.2800	12.6000	156.6000

Nutrients removed in harvested part (lb/ton) at 10 ton yield level and 21 acres.

Nitrogen	Phosphorus	Potassium
2063.8800	264.6000	3288.6000

Element-Fertilizer Equivalents | Average NPK Percentages

«Contents»

Intellectual Property Statement / How to Cite the PLANTS Database
Disclaimers
USDA non-discrimination policy

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Time Generated: Thur 9:34 AM - 11/19/2009

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	River Valley Dairy	Field(s):	LAA-D	Date:	Nov'12
Planner:	Chet Wyant	Location:	DonaAna	Crop:	Oat Sil.
Soil Permeability (in/hr):	0.3	Slope (%):	0.5	Planned/Exist.:	Planned

Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
					X	8
Phosphorus (P_2O_5) Application Rate	None Applied	<30 lbs/ac P_2O_5	30-90 lbs/ac P_2O_5	>90-150 lbs/ac P_2O_5	>150 lbs/ac P_2O_5	
					X	8
Organic Phosphorus Source Application Method	None Applied	Injected Deeper than 2 inches	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
			X			2
Phosphorus Fertilizer Application Method	None Applied	Placed with Planter Deeper than 2 in.	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
	X					0
Proximity of Nearest Field Edge to Named Stream or Lake	Very Low >1000 feet	Low >500-1000 feet	Medium >200-500 feet	High 30-200 feet	Very High <30 feet	
	X					0
Soil Erosion (wind & water)	Very Low <1 t/ac	Low 1-3 t/ac	Medium >3-5 t/ac	High >5-15 t/ac	Very High >15 t/ac	
	X					0
Runoff Class (Runoff Class Table 2)	Very Low or Negligible	Low	Medium	High	Very High	
		X				1.5
Irrigation Erosion (See QS note)	Not Irrigated or No Furrow Irrigation	Tailwater Recovery or QS<6 for very erodible soils or QS<10 for resistant soils	QS>10 for erosion resistant soils	QS>10 for erodible soils	QS>6 for very erodible soils	
			X			3
Grazing Management	Not Grazed	Graze Crop Residues	Pasture <30% Dry Matter as Supplemental Feed	Pasture 30 to 60% Dry Matter as Supplemental Feed	Pasture 60 to 100% Dry Matter as Supplemental Feed	
	X					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
		X				1.5

P Hazard Class:	Medium	Total Index Points:	24.0
Phosphorus Application Classification:	N Based		

Notes:

This evaluation has a Medium P hazard class and the nutrient application can be based on N.

Comments: Soil Erosion = (WEQ 10/12 to 5/13) 0.09 t/ac + (RUSLE 2) 0.13 t/ac = 0.22 t/ac

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	River Valley Dairy	Field(s):	LAA-D	Date:	Jun'13
Planner:	Chet Wyant	Location:	DonaAna	Crop:	Sudan Sil.
Soil Permeablity (in/hr):	0.3	Slope (%):	0.5	Planned/Exist.:	Planned

Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
					X	8
Phosphorus (P_2O_5) Application Rate	None Applied	<30 lbs/ac P_2O_5	30-90 lbs/ac P_2O_5	>90-150 lbs/ac P_2O_5	>150 lbs/ac P_2O_5	
		X				1
Organic Phosphorus Source Application Method	None Applied	Injected Deeper than 2 inches	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
				X		4
Phosphorus Fertilizer Application Method	None Applied	Placed with Planter Deeper than 2 in.	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
	X					0
Proximity of Nearest Field Edge to Named Stream or Lake	Very Low >1000 feet	Low >500-1000 feet	Medium >200-500 feet	High 30-200 feet	Very High <30 feet	
	X					0
Soil Erosion (wind & water)	Very Low <1 t/ac	Low 1-3 t/ac	Medium >3-5 t/ac	High >5-15 t/ac	Very High >15 t/ac	
		X				1.5
Runoff Class (Runoff Class Table 2)	Very Low or Negligible	Low	Medium	High	Very High	
		x				1.5
Irrigation Erosion (See QS note)	Not Irrigated or No Furrow Irrigation	Tailwater Recovery or QS<6 for very erodible soils or QS<10 for resistant soils	QS>10 for erosion resistant soils	QS>10 for erodible soils	QS>6 for very erodible soils	
			X			3
Grazing Management	Not Grazed	Graze Crop Residues	Pasture <30% Dry Matter as Supplemental Feed	Pasture 30 to 80% Dry Matter as Supplemental Feed	Pasture 80 to 100% Dry Matter as Supplemental Feed	
	X					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
		X				1.5

P Hazard Class:	Medium	Total Index Points:	20.5
Phosphorus Application Classification:	N Based		

Notes:

This evaluation has a Medium P hazard class and the nutrient application can be based on N.

Comments: Soil Erosion = (WEQ 6/13 to 10/13) 1.17 t/ac + (RUSLE 2) 0.00069 t/ac = 1.17 t/ac

NRCS Natural Resources Conservation Service

Irrigation Water Management

Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: River Valley Dairy **Tract:** 735

Planner: Chet Wyant **Field(s) No.:** LAA-D

Current Land Use: Oat Silage/ Sudangrass Silage **Total Acres:** 21

Date: 11/19/2009 **Date to apply:** 11/1/2012

See the Conservation Plan map for the location of the field(s) to applying IWM.

Purposes (check all that apply)

- ☐ Manage soil moisture to improve crops
- ☑ Optimize use of water
- ☑ Minimize Irrigation Erosion
- ☐ Decrease non-point source pollution
- ☐ Manage salt in the root zone
- ☐ Manage air, soil, or plant microclimate

Conditions where practice applies

This practice is applicable to all irrigated lands. An irrigation system adapted for the site conditions is available and capable of applying water to meet the intended purpose(s).

Soil (Series, Texture, and Map Unit) *Select the soil to manage for:*

Critical soil to manage:	**Glendale CL, Mimbres soils, Stellar SICL; 22-37, 221**	Intake Family (in/hr):	**0.30**

Soil Interpretations for Irrigaiton

Crop Name	Rooting Depth	Moisture Replacement Depth (ft)	Water Holding Capacity (in)	Mgt Allowed Depletion (MAD) (%)	Net Water to Replace (in)	Time Needed to Infiltrate (hrs)
Oat, hay; Deming	Medium	3.0	6.0	50%	3.0	6.3
Sudangrass, hay or silage; Deming	Medium	3.0	6.0	65%	3.9	9.7

Crop Consumptive Use (CU) Information *(inches/month needed)*

Crop:	Oat, hay; Deming		Total Irrigation Needed:	9.4 ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar	>1 Mo.	2.3	Sep		0.0
Apr	18	5.0	Oct		0.0
May	>1 Mo.	2.1	Nov		0.0
Jun		0.0	Dec		0.0

Crop:	Sudangrass, hay or silage; Deming		Total Irrigation Needed:	14.1 ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan		0.0	Jul	>1 Mo.	3.3
Feb		0.0	Aug	16	7.2
Mar		0.0	Sep	>1 Mo.	3.7
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Crop:			Total Irrigation Needed:		ac in/ac
Month	Est. Frequency (days between irr.)	In/Mo	Month	Est. Frequency (days between irr.)	In/Mo
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Crop:			Total Irrigation Needed:		ac in/ac
Month	Est. Frequency (days between irr.)	In/Mo	Month	Est. Frequency (days between irr.)	In/Mo
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Farm Irrigation Rating System (FIRS, irrigation system efficiency)

Type of System:	Flood, controlled		System Efficiency (%):	80%
System Capacity (Ditch/Pump/Well):	1400	GPM		

Crop Grown	Days of Operation for CU by crop (days)	Est. System Application Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Oat, hay; Deming	3	2.84	0.17	System meets CU for crop
Sudangrass, hay or silage; Deming	5	2.84	0.24	System meets CU for crop

Operation and Maintenance Requirements

1. Irrigate when the soils reaches the MAD level, determined by soil moisture monitoring. Use one of the following methods to monitor soil moisture; the feel method, tensiometers, electrical resistance blocks, or moisture probes. Drip or Center Pivots can be irrigated on an as needed basis to meet daily CU.

2. Test irrigation water for Nitrate and Salts (Total Desolved Solids/Electrical Conductivity)

3. Do not exceed the net water to replace listed above when irrigating, unless salts are being managed.

4. Do not apply water at rates that cause runoff or erosion.

5. Monitor the soil to maintain: pH, permeability, salinity, and structure.

6. Application of pond effluent shall not exceed the crop needs (water and nutrient), and will not exceed the water holding capacity listed above.

7. Consider using crops such as sorghum, cotton, or winter wheat when water supplies are short.

8. Avoid traffic on wet soils to minimize soil compaction.

Additional Requirements

Job Approval and Completion

Client: _____ **Date:** 11-23-09

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

USDA NRCS Natural Resources Conservation Service

RUSLE2 Worksheet Erosion Calculation Record

Info: Nov'12-May'13 Oat Silage, Jun'13-Oct'13 Sundangrass Silage

Tract #: 735
Owner name: River Valley Dairy
Field name: LAA-D

Location: New Mexico\DonaAna County\NM_Dona Ana R 9
Soil: Gf GLENDALE CLAY LOAM\GLENDALE clay loam 85%
Slope length (horiz): 100.0 ft
Avg. slope steepness: 0.50 %
T value: 5.0 t/ac/yr

Alternatives:

Management	*Contouring*	*Strips / barriers*	*Diversion/terrace, sediment basin*	*Cons. plan. soil loss, t/ac/yr*	*Description*
a.Single Year/Single Crop Templates\Forage\Oats, hay and grain, conv till, irr, CMZ29	b. absolute row grade 0.5 percent	(none)	(none)	0.13	
a.Single Year/Single Crop Templates\Haygrazer, sudangrass, disk	b. absolute row grade 0.5 percent	(none)	(none)	0.00069	

NRCS - WEQ CALCULATIONS

Version 9 03 11-19-2007

Producer: River Valley Dairy | Planner: Chet Wyant | Location: Anthony, NM | Tract: 735 | Field: LAA-D

Crop Rotation: Oat Silage/Sundangrass Silage | Climate Data Station: NM, LAS CRUCES | Site "C" Value: 150

Tillage Direction (NS/EW): NS | Length/width ratio: 4 | Field Direction (NS/EW): NS | Field Width (Ft.): 570

Irrigation (Y or N): Y | Soil "I": 86 | Wind Erodibility Group: 4L (1-7) | TWF: 2 (see instr.)

Sum Period Erosion (t/ac): 1.3 | No. Yrs in Rotation: 1.0 | Av. Annual Wind Erosion: 1.3 (t/ac/yr)

Calculations and Output

Mgt. Periods		Irr.	Soil	Ridge Roughness				Random Roughness	Unsheltered Distance				SCe	Erosion			
Dates		No. of	"I"	Dev.	Ht.	Sp.	"Krd"	"Kr"	Dev.	Prep.	WED	"L"	"V"	"E"	EWE	"If"	Loss
Begin	End	(#)	(t/ac)	(deg)	(in.)	(in.)	(factor)	(factor)	(deg)	(factor)	(factor)	(ft)	(lbs/ac)	(t/ac)	(%)	(%)	(t/ac)
10/7	10/14/12	0	56	0.0	2	30	0.70	0.86	0.0	3.3	1.010	576	0	30.7	0.3	1.00	0.09
10/14	10/21/12	0	56	0.0	3	30	0.52	0.52	0.0	3.3	1.010	576	6999	0.0	0.3	1.00	0.00
10/21	11/01/12	0	56	0.0	4	11	0.26	0.52	0.0	3.3	1.010	576	2851	0.0	0.5	1.00	0.00
11/1	01/30/13	1	56	0.0	2	30	0.69	0.99	0.0	4.0	1.010	576	2774	0.0	16.3	0.98	0.00
1/30	02/14/13	2	56	0.0	2	30	0.69	0.86	0.0	4.0	1.010	576	2774	0.0	11.3	0.73	0.00
2/14	03/01/13	1	56	0.0	2	30	0.69	0.86	0.0	4.0	1.010	576	2774	0.0	12.7	0.87	0.00
3/1	05/01/13	1	56	0.0	2	30	0.69	0.99	0.0	4.0	1.010	576	2774	0.0	44.3	0.97	0.00
5/1	06/01/13	0	56	0.0	2	30	0.69	0.99	0.0	4.0	1.010	576	2593	0.0	11.0	1.00	0.00
6/1	06/11/13	0	56	22.5	3	30	0.67	0.52	22.5	1.2	1.500	855	400	10.8	0.5	1.00	0.06
6/11	06/21/13	0	56	22.5	4	11	0.48	0.52	22.5	1.2	1.500	855	83	8.7	0.5	1.00	0.05
6/21	07/21/13	1	56	22.5	2	30	0.79	0.99	22.5	1.2	1.500	855	80	46.3	0.8	0.93	0.34
7/21	08/20/13	1	56	67.5	2	30	0.81	0.99	67.5	1.1	1.750	998	80	49.7	0.3	0.93	0.12
8/20	10/01/13	1	56	90.0	2	30	0.90	0.99	90.0	2.8	3.740	2132	80	64.1	1.0	0.95	0.60
10/1	10/07/13	1	56	0.0	2	30	0.70	0.86	0.0	3.3	1.010	576	6999	0.0	0.3	0.67	0.00
		0			2	30											
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															

Year 5

Dairy Annual Nutrient Manager

Date	11/19/2009	NM STATE UNIVERSITY Dairy Extension Program	Victor E. Cabrera Dairy Specialist dairy.nmsu.edu: Tools vcabrera@nmsu.edu	**PLANNED**		
Dairy	River Valley Dairy				N Loss	0%
Crop_Year	2013-2014				Goal/Real	**Nutrient Needed**
Field_ID	LAA-D					
Area (ac)	21					
	Month - Month	Crop	Unit	Yield	N	P
1st Crop	Nov'13-Oct'14	Alfalfa, for hay	t/ac	10	10583	992
2nd Crop					0	0
					0	0
Total		Nutrient Needed			10,583	992
					Soil Analyses	
Texture by Feel		Loam			N	P
Nutrient Available in Soil			lb/ac		50	206.55
		Nutrient Still Needed			9,533	-3,346
					Effluent Analyses	
					N	P
Effluent Manure Application		NM Dairy Ponds Net from J.S. 590 L&MLA	ac-in	3.65	1993	437
			ac-in		0	0
			ac-in		0	0
		Nutrient Still Needed			7,540	-3,783
					Manure Analyses	
					N	P
Dry Manure Application			t/ac		0	0
			t/ac		0	0
			t/ac		0	0
		Nutrient Still Needed			7,540	-3,783
					Fertilizer Content	
					N	P
Chemical Fertilizers Applied			lb/ac		0	0
			lb/ac		0	0
			lb/ac		0	0
		Annual Nutrient Balance			**7,540**	**-3,783**

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:	River Valley Dairy	Acres:	21	Date:	11/11/2009	Field ID:	LAA-D

Application information (enter the units that will be or has been applied to the field):					
Crop Rotation: Alfalfa				Needed for field (acin):	76.65
Liquid Applied:	3.65	AcIn/ac		(gal):	2,081,048
Solids Applied:		ton/ac		Needed for field (tons):	
Liquid Loads Applied:		1000gal/ac		Loads needed for field:	

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:					

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Beef (DM)		0		0		0.0		0		0

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:	145.8	187.1	0.4	100	250

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (99-99.4% liq.)	99		0	42	0	33	0	17	0	68

	TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
	Book	Test	Book	Test	Book	Test	Book	Test
	0.0		0.0		0.0		0.0	

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Dry	60 %	0 (lbs/ton) NH4-N
Liquid (type of application)	**Type of Climate**	**Percent Remaining**	**26.4** (lbs/acin) NH4-N
Surface Irr w/o incorp & w/crop canopy	Warm Dry	80 %	0.0 (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	0	0	0

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	4	13	54
	Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
	0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
<2	Well Drained	88

Summary of Nutrients

Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	26	0
P_2O_5	0.0	13	0
K_2O	0.0	54	0

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	96.7	46.2	198.8

USDA Natural Resources Conservation Service
PLANTS

Nutrient Report Summary for the Crop(s) Selected

The table below summarizes the nutrients removed for the crops selected in the previous page. Crop nutrient information for individual crops follow the summary table.

Return to the crop list and make a new selection of crop(s)

Alfalfa, for hay
Forage
Medicago sativa
Plant part harvested: Aboveground biomass
Crop yield unit: ton

Nutrients in harvested part (lb/ton) at 9.65% moisture percentage.

Nitrogen	Phosphorus	Potassium
50.3935	4.7217	38.2939

Nutrients removed in harvested part (lb/acre) at 10 ton yield level.

Nitrogen	Phosphorus	Potassium
503.9354	47.2166	382.9392

Nutrients removed in harvested part (lb/ton) at 10 ton yield level and 21 acres.

Nitrogen	Phosphorus	Potassium
10582.6426	991.5488	8041.7240

Element-Fertilizer Equivalents | Average NPK Percentages

«Contents»

Intellectual Property Statement / How to Cite the PLANTS Database
Disclaimers
USDA non-discrimination policy

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Time Generated: Thur 9:30 AM - 11/19/2009

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	River Valley Dairy	Field(s):	LAA-D	Date:	Nov'13
Planner:	Chet Wyant	Location:	DonaAna	Crop:	Alfalfa
Soil Permeablity (in/hr):	0.3	Slope (%):	0.5	Planned/Exist.:	Planned

Site Characteristic	Place an X in the appropriate box for each of the Site Characteristic listed below.					Sub Total
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
					X	8
Phosphorus (P_2O_5) Application Rate	None Applied	<30 lbs/ac P_2O_5	30-90 lbs/ac P_2O_5	>90-150 lbs/ac P_2O_5	>150 lbs/ac P_2O_5	
			X			2
Organic Phosphorus Source Application Method	None Applied	Injected Deeper than 2 inches	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
				X		4
Phosphorus Fertilizer Application Method	None Applied	Placed with Planter Deeper than 2 in.	Incorporated Immediately before Planting	Incorp. >3 Mo. Before Planting or Surface Applied <3 Mo. before Planting	Surface Applied >3 Months Before Planting	
	X					0
Proximity of Nearest Field Edge to Named Stream or Lake	Very Low >1000 feet	Low >500-1000 feet	Medium >200-500 feet	High 30-200 feet	Very High <30 feet	
	X					0
Soil Erosion (wind & water)	Very Low <1 t/ac	Low 1-3 t/ac	Medium >3-5 t/ac	High >5-15 t/ac	Very High >15 t/ac	
	X					0
Runoff Class (Runoff Class Table 2)	Very Low or Negligible	Low	Medium	High	Very High	
		X				1.5
Irrigation Erosion (See QS note)	Not Irrigated or No Furrow Irrigation	Tailwater Recovery or QS<6 for very erodible soils or QS<10 for resistant soils	QS>10 for erosion resistant soils	QS>10 for erodible soils	QS>6 for very erodible soils	
			X			3
Grazing Management	Not Grazed	Graze Crop Residues	Pasture <30% Dry Matter as Supplemental Feed	Pasture 30 to 80% Dry Matter as Supplemental Feed	Pasture 80 to 100% Dry Matter as Supplemental Feed	
	X					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
		X				1.5

P Hazard Class:	Medium	Total Index Points:	20.0
Phosphorus Application Classification:		N Based	

Notes:

This evaluation has a Medium P hazard class and the nutrient application can be based on N.

Comments: Soil Erosion = (WEQ 10/13 to 10/14) 0.03 t/ac + (RUSLE 2) 0.036 t/ac = 0.07 t/ac

NRCS Natural Resources Conservation Service

Irrigation Water Management

Conservation Practice Job Sheet *449*

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: River Valley Dairy **Tract:** 735
Planner: Chet Wyant **Field(s) No.:** LAA-D
Current Land Use: Alfalfa **Total Acres:** 21
Date: 11/19/2009 **Date to apply:** 11/1/2013

See the Conservation Plan map for the location of the field(s) to applying IWM.

Purposes (check all that apply)

- ☐ Manage soil moisture to improve crops
- ☑ Optimize use of water
- ☑ Minimize Irrigation Erosion
- ☐ Decrease non-point source pollution
- ☐ Manage salt in the root zone
- ☐ Manage air, soil, or plant microclimate

Conditions where practice applies

This practice is applicable to all irrigated lands. An irrigation system adapted for the site conditions is available and capable of applying water to meet the intended purpose(s).

Soil (Series, Texture, and Map Unit) *Select the soil to manage for:*

Critical soil to manage:	**Glendale CL, Mimbres soils, Stellar SICL; 22-37, 221**	Intake Family (in/hr):	**0.30**

Soil Interpretations for Irrigaiton

Crop Name	Rooting Depth	Moisture Replacement Depth (ft)	Water Holding Capacity (in)	Mgt Allowed Depletion (MAD) (%)	Net Water to Replace (in)	Time Needed to Infiltrate (hrs)
Alfalfa, hay, southern; Las Cruces	Deep	4.0	8.0	50%	4.0	10.1

Crop Consumptive Use (CU) Information *(inches/month needed)*

Crop:	Alfalfa, hay, southern; Las Cruces		**Total Irrigation Needed:**	47.7 ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan		0.0	**Jul**	12	9.7
Feb		0.0	**Aug**	16	7.7
Mar	>1 Mo.	1.6	**Sep**	21	5.7
Apr	29	4.2	**Oct**	>1 Mo.	2.7
May	17	6.9	**Nov**		0.0
Jun	13	9.3	**Dec**		0.0

Crop:			**Total Irrigation Needed:**	ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan		0.0	**Jul**		0.0
Feb		0.0	**Aug**		0.0
Mar		0.0	**Sep**		0.0
Apr		0.0	**Oct**		0.0
May		0.0	**Nov**		0.0
Jun		0.0	**Dec**		0.0

Crop:			Total Irrigation Needed:	ac in/ac	
Month	Est. Frequency (days between irr.)	In/Mo	Month	Est. Frequency (days between irr.)	In/Mo
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Crop:			Total Irrigation Needed:	ac in/ac	
Month	Est. Frequency (days between irr.)	In/Mo	Month	Est. Frequency (days between irr.)	In/Mo
Jan		0.0	Jul		0.0
Feb		0.0	Aug		0.0
Mar		0.0	Sep		0.0
Apr		0.0	Oct		0.0
May		0.0	Nov		0.0
Jun		0.0	Dec		0.0

Farm Irrigation Rating System (FIRS, irrigation system efficiency)

Type of System: **Flood, controlled** System Efficiency (%): **80%**

System Capacity (Ditch/Pump/Well): **1400** GPM

Crop Grown	Days of Operation for CU by crop (days)	Est. System Application Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Alfalfa, hay, southern; Las Cruces	17	2.84	0.32	System meets CU for crop

Operation and Maintenance Requirements

1. Irrigate when the soils reaches the MAD level, determined by soil moisture monitoring. Use one of the following methods to monitor soil moisture; the feel method, tensiometers, electrical resistance blocks, or moisture probes. Drip or Center Pivots can be irrigated on an as needed basis to meet daily CU.

2. Test irrigation water for Nitrate and Salts (Total Desolved Solids/Electrical Conductivity)

3. Do not exceed the net water to replace listed above when irrigating, unless salts are being managed.

4. Do not apply water at rates that cause runoff or erosion.

5. Monitor the soil to maintain: pH, permeability, salinity, and structure.

6. Application of pond effluent shall not exceed the crop needs (water and nutrient), and will not exceed the water holding capacity listed above.

7. Consider using crops such as sorghum, cotton, or winter wheat when water supplies are short.

8. Avoid traffic on wet soils to minimize soil compaction.

Additional Requirements

Job Approval and Completion

Client: _____ **Date:** 11-23-09

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

USDA NRCS Natural Resources Conservation Service

RUSLE2 Worksheet Erosion Calculation Record

Info: Nov'13-Oct'14 Alfalfa

Tract #: 735
Owner name: River Valley Dairy
Field name: LAA-D

Location: New Mexico\DonaAna County\NM_Dona Ana R 9
Soil: Gf GLENDALE CLAY LOAM\GLENDALE clay loam 85%
Slope length (horiz): 100.0 ft
Avg. slope steepness: 0.50 %
T value: 5.0 t/ac/yr

Alternatives:

Management	*Contouring*	*Strips / barriers*	*Diversion/terrace, sediment basin*	*Cons. plan. soil loss, t/ac/yr*	*Description*
b.Mullti-year Rotation Templates\Alfalfa-Small Grain, 5yr, 5cuts CMZ 23	b. absolute row grade 0.5 percent	(none)	(none)	0.036	

NRCS - WEQ CALCULATIONS

Version 9.03 11-19-2007

Producer: River Valley Dairy | Planner: Chet Wyant | Location: Anthony, NM | Tract: 735 | Field: LAA-D

Crop Rotation: Alfalfa | Climate Data Station: NM, LAS CRUCES | Site "C" Value: 150

Tillage Direction (NS/EW): NS | Length/width ratio: 4 | Field Direction (NS/EW): NS | Field Width (Ft.): 570

Irrigation (Y or N): Y | Soil "I": 86 | Wind Erodibility Group: 4L (1-7) | TWF: 2 (see instr.)

Sum Period Erosion (t/ac): 0.0 | No. Yrs in Rotation: 1.0 | Av. Annual Wind Erosion: (t/ac/yr)

Calculations and Output

Mgt Periods		Irr.	Soil	Ridge Roughness				Random Roughness	Unsheltered Distance				SCe	Erosion			
Dates		No. of	"I"	Dev.	Ht.	Sp.	"Krd"	"Kr"	Dev.	Prep.	WED	"L"	"V"	"E"	EWE	"F"	Loss
Begin	End	(#)	(t/ac)	(deg)	(in.)	(in.)	(factor)	(factor)	(deg)	(factor)	(factor)	(ft)	(lbs/ac)	(t/ac)	(%)	(%)	(t/ac)
11/1	11/02/13	0	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	0	14.3	0.2	1.00	0.02
11/2	01/02/14	0	56	0.0	2	10	0.44	0.99	0.0	4.0	1.010	576	2094	0.0	12.5	1.00	0.00
1/2	01/17/14	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1582	0.3	2.0	0.87	0.01
1/17	02/01/14	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1651	0.2	2.0	0.87	0.00
2/1	02/16/14	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	1722	0.1	12.7	0.87	0.00
2/16	03/03/14	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	3319	0.0	12.7	0.87	0.00
3/3	03/18/14	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	6994	0.0	12.9	0.87	0.00
3/18	06/16/14	3	56	0.0	2	10	0.44	0.99	0.0	4.0	1.010	576	6994	0.0	41.5	0.93	0.00
6/16	07/01/14	0	56	22.5	2	10	0.62	0.86	22.5	1.2	1.500	855	4124	0.0	0.8	1.00	0.00
7/1	07/16/14	1	56	67.5	2	10	0.65	0.86	67.5	1.1	1.750	998	2856	0.0	0.2	0.87	0.00
7/16	07/31/14	0	56	67.5	2	10	0.65	0.86	67.5	1.1	1.750	998	4124	0.0	0.2	1.00	0.00
7/31	08/15/14	1	56	67.5	2	10	0.65	0.86	67.5	1.1	1.750	998	2856	0.0	0.1	0.87	0.00
8/15	08/30/14	0	56	90.0	2	10	0.81	0.86	90.0	2.8	3.740	2132	4124	0.0	0.1	1.00	0.00
8/30	09/14/14	1	56	90.0	2	10	0.81	0.86	90.0	2.8	3.740	2132	2856	0.0	0.4	0.87	0.00
9/14	09/29/14	0	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	4124	0.0	0.5	1.00	0.00
9/29	10/14/14	1	56	0.0	2	10	0.44	0.86	0.0	4.0	1.010	576	2856	0.0	0.6	0.87	0.00
10/14	10/29/14	0	56	0.0	2	10	0.46	0.86	0.0	3.3	1.010	576	4124	0.0	0.6	1.00	0.00
		0			2	10											
		0															
		0															
		0															
		0															
		0															
		0															
		0															
		0															

Appendix B

Emergency Action Plan and Safety Precautions

This Emergency Action Plan (EAP) is taken from the New Mexico NRCS Comprehensive Nutrient Management Plan program.

Emergency Action Plan and Safety Precautions

Emergency Action Plan

Summary Action Plan

Facility Name		
Emergency Numbers ***911* **	➢ **Ambulance, Fire, Police – 911** ➢ **Sheriff Dept. :** **County- 575/**	
Non-Emergency Numbers	**State Police** **Sheriff Dept.** **Spill Recovery** **Spill Reporting** **Owner:** ➢ ➢	**575/** **575/** **575/** **or 505-827-9329** **575/** **or 505-827-9329**
Recovery Equipment	**Heavy equipment is located on the Farm at various staging locations within ½ mile or closer to the Dairy facility.**	**Type of equipment includes large farm tractor with portable pump (pto driven), 5 front end loaders, road grader, backhoes and vac-tank.**
Action Plan	**Spills from Containment Structures: In the event of such failure, containment of the spill will be addressed by properly draining the structures, with effluent allowed to evaporate or be applied to cropland fields. Structures will then be repaired or replaced according to a certified engineering design.**	
	Spills during Pumping: In the event of such failure, containment of the spill will be addressed by constructing a dike (an earthen embankment) around the spill. Effluent will be allowed to evaporate or be pumped into a transport tanker for delivery to the storage lagoon. Structures will then be repaired or replaced according to a certified engineering design.	
	Spills during Transport: In the event of such failure, containment of the spill will be addressed by constructing a dike around the spill, ceasing the transport of the effluent, and allow the effluent to evaporate or be pumped into a transport tanker for delivery to the storage lagoon. Structure or equipment will then be repaired or replaced accordingly.	

Emergency action plans are required to meet current animal waste management regulations. Develop an emergency action plan for your waste handling system. This plan will be implemented in the event that wastes from your operation are leaking, overflowing, or running off the site. Example Dairy will call before the problem leaves the dairy. You should NOT wait until wastes reach surface waters or leave your property to consider that you have a problem. You should make every effort to ensure that this does not happen. This plan should be available to all employees at the facility, as accidents, leaks, and breaks could happen at any time. Example Dairy will: (1) stop the release of wastes; (2) assess the extent of the spill and note any obvious damages; (3) contact the appropriate agencies; and (4) implement procedures to rectify the damage and repair the waste management system.

1. **Stop the release of wastes.** Depending on the situation, this may or may not be possible. Suggested responses to several problems are listed below:

   a. *Lagoon or slurry basin overflow* - possible solutions are:

   - add soil to berm to increase elevation of dam
   - pump wastes to fields at an acceptable rate
   - stop all additional flow to the structure (waters, flushing system, etc.)
   - call a pumping contractor
   - make sure no surface water is entering storage structure

   *Note: *These activities should be started when your lagoon level has exceeded the temporary storage level.*

   b. *Runoff from waste application field* actions include:

   - immediately stop waste application
   - create a temporary diversion or berm to contain the waste in the field
   - incorporate waste to reduce further runoff
   - evaluate and eliminate the reason(s) that caused the runoff
   - evaluate the application rates for the fields where runoff occurred

   c. *Leakage from the waste distribution system:*

   - pipes and sprinklers – actions include:
     - ☐ stop recycle (flushing system) pump
     - ☐ stop irrigation pump
     - ☐ close valves to eliminate further discharge
     - ☐ separate pipes to create an air gap and stop flow

☐ repair all leaks prior to restarting pumps

- flush system, houses, solids separators – actions include:
  - ☐ stop recycle (flushing system) pump
  - ☐ stop irrigation pump
  - ☐ make sure no siphon effect has been created
  - ☐ separate pipes to create an air gap and stop flow
  - ☐ repair all leaks prior to restarting pumps

d. *Leakage from base or sidewall of lagoon or earthen storage structure.* Often these are seepage rather than flowing leaks- possible action:

- dig a small well or ditch to catch all seepage, put in a submersible pump, and pump back into lagoon
- if holes are caused by burrowing animals, trap or remove animals and fill holes and compact with a clay type soil
- other holes may be likewise temporarily plugged with clay soil

* *Note: Problems with lagoons and earthen storage structures require the consultation of an individual experienced in the design and installation of lagoons for permanent repair measures.*

2. **Assess the extent of the spill** and note any obvious damages.
   a. *Did the waste reach any surface waters?*
   b. *Approximately how much was released and for what duration?*
   c. *Any damage noted, such as employee injury, fish kills, or propertydamage?*
   d. *Did the spill leave the property?*
   e. *Does the spill have the potential to reach surface waters?*
   f. *Could a future rain event cause the spill to reach surface waters?*

g. *Are potable water wells in danger (either on or off the property)?*

3. **Contact appropriate agencies**

During normal business hours, call your NMED office; after hours, call this emergency number:505-827-9329. Your phone call should include: your name, facility, telephone number, the details of the incident from item 2 above, the exact location of the facility, and the location or direction of movement of the spill, weather and wind conditions, what corrective measures have been undertaken, and the seriousness of the situation.

a. *If spill leaves property call local EMS. If spill enters surface water call EPA.*

b. *Instruct EMS to contact local Health Department.*

c. *Contact CES, local SWCD office, and local NRCS office for advice/technical assistance.*

d. *If none of the above works, call 911 or the Sheriff's Department and explain your problem to them. Ask them to contact the agencies as listed above.*

4. **Implement procedures** as advised by NMED and technical assistance agencies to rectify the damage, repair the system, and reassess the waste management plan to keep problems with release of wastes from happening again.

Suggested Safety Precautions

Safety Precautions

Accidents and injuries don't just happen, they are caused. Behind every accident is a chain of events that leads up to an unsafe act, unsafe conditions, or a combination of both. Safety in the workplace should be everyone's concern. Communication between supervisors and employees generates ideas and safety awareness that leads to accident prevention. Safety programs, safety manuals, and safety meetings are essential in providing the lines of communication that lead to a safe, accident-free workplace.

Dangerous Gases

Dangerous situations can be associated with five main gases that are produced in livestock and poultry buildings and manure storage structures. These gases are listed in Table 1 along with some of their characteristics. All of these are colorless.

Table 1. Characteristics and Effects of Gases Produced in Livestock Buildings and Manure Storage Structures

Gas	Odor	Density	Health Effects
Ammonia (NH_3)	Pungent	Lighter than air	Irritation to eyes and nose. Asphyxiating at high levels.
Carbon Dioxide (CO_2)	None	Heavier than air	Drowsiness, headache. Can be asphyxiating.
Carbon Monoxide (CO)	None	Heavier than air	Headache, chest pains, potential for problems with developing fetuses. Can be asphyxiating.
Hydrogen Sulfide (H_2S)	Rotten-egg smell	Heavier than air	TOXIC: causes headache, dizziness, nausea, unconsciousness, death.
Methane (CH_4)	None	Lighter than air	Headache, asphyxiant, explosive in 5% to 15% mixture methane with air.

Ammonia

Ammonia (NH_3) is released from fresh manure and urine and during anaerobic decomposition. Ammonia levels tend to be high in buildings where manure is not regularly and thoroughly removed. Examples include buildings with litter, solid floors, or scrapers where manure is spread over the floor. Heated floors can increase ammonia release. Furthermore, when pH levels are higher than 8.0, ammonia is more susceptible to being released. Ammonia is very soluble in water, therefore liquid manure systems tend to release less ammonia. Building ventilation also affects ammonia levels in the air.

Carbon Dioxide

Death of animals in closed confinement buildings following a ventilation-equipment failure (such as a power failure) is due in part to excessive carbon dioxide. Carbon dioxide (CO_2) is released by unvented heaters, through livestock respiration and manure decomposition. In fact, most of the gas in bubbles coming from stored manure or lagoons is CO_2. Vigorous agitation of stored manure can also release a large amount of carbon dioxide in a short time period.

Carbon Monoxide

Carbon monoxide (CO) can cause workers to develop headaches and experience chest pain. Pregnant women should be aware of the potential health hazard this gas poses to a developing fetus. Carbon monoxide is rare in confinement buildings, but can accumulate in areas with poor ventilation such as swine farrowing rooms and nursery buildings. Evidence of carbon monoxide overexposure among livestock may

first appear as aborted litters and stillbirth. The main sources of CO are heaters (LP-fired, radiant brooder, or space).

Hydrogen Sulfide

Hydrogen Sulfide (H_2S) is the most toxic gas generated from the storage liquid manure storage. Exposure to 200 ppm for an hour can cause headaches and dizziness; 500 ppm for 30 minutes can cause severe headaches, nausea, excitement, or insomnia. High concentrations of 800 to 1,000 ppm can cause immediate unconsciousness and death through respiratory paralysis unless the victim is moved to fresh air and artificial respiration is immediately applied. Be aware even the characteristic rotten-egg smell of hydrogen sulfide does not give adequate warning. The sense of smell is rapidly fatigued by the gas and high concentrations do not give a proportionately higher odor intensity. Also note that dangerous concentrations can be released by agitation of stored liquid manure. Concentrations reaching 200 to 300 ppm have been reported in buildings a few minutes after starting to pump waste from a storage pit and can be as high as 800 ppm during vigorous agitation.

Methane

Methane (CH_4) is a product of manure decomposition under strict anaerobic conditions, such as those found in an anaerobic or biogas digester. It is insoluble in water, lighter than air, and thus will accumulate in stagnant air corners in the top of enclosed pits or buildings. Methane is not toxic, but at high concentrations may cause an asphyxiating environment. Methane concentrations in confinement housing is normally well below the levels that may be explosive. However, explosions attributed to methane have occurred around manure storage pits.

First Aid for Victims of Manure-Gas Asphyxiation

1. Do not attempt to rescue a victim from a hazardous gas situation unless you are protected with a supplied air-breathing apparatus.

2. Have someone telephone for an emergency medical (rescue) squad, informing them there is a "victim of toxic gas asphyxiation."

3. If the victim is free from the immediate area of danger and there is no personal threat to life, check for breathing (with the victim on his/her back). If there is no breathing, give four quick breaths and check for a pulse.

    - *If there is a pulse*, continue mouth-to-mouth breathing every 5 seconds (12 per minute).
    - *If there is no pulse*, start CPR (cardio-pulmonary resuscitation) immediately.

Training courses for rescue breathing and CPR are available through local Red Cross and Cooperative Extension Service centers. These courses provide the training and practice necessary to perform CPR.

Effect of Air Quality on Human Health

Health problems associated with poor air quality include coughing, phlegm production, wheezing, chest tightness, headaches, shortness of breath, eye irritation, sneezing, runny nose, and nasal congestion. Problems are usually greater the more time a worker spends in the presence of the contaminant and the greater the concentrations of airborne contaminants. In addition, some people are more susceptible than others.

Health problems may be chronic (lasting a long time) or acute (severe but short term). Since chronic and acute problems can be mistaken for other health problems, such as the flu or allergies, the work

environment is often overlooked as a cause of the symptoms and precautions are therefore not taken. Table 2lists some symptoms swine facility workers in Iowa have experienced as the result of poor air quality in the swine houses.

Table 2. Health Symptoms of Iowa Swine Facility Workers	
Symptom	Prevalence (percent)
Cough	67
Sputum or phlegm	56
Scratchy throat	54
Runny nose	45
Burning or watery eyes	39
Headaches	37
Chest tightness	36
Shortness of breath	30
Wheezing	27

Safety Precautions with Manure Storage

You should consider safety when constructing, operating and managing animal waste management systems. The following major safety points should be considered when installing and operating manure equipment, structures, or systems:

1. Do not enter a manure pit unless following procedures for entering a confined space.
2. When agitating a manure storage structure, always have at least one additional person available to seek help if trouble occurs.
3. Properly designed and operated ventilation systems can reduce the concentration of gases within the building, thereby improving animal performance.
4. When possible, construct lids for manure pits and tanks. Keep these lids in place. If an open, ground-level tank or pit is necessary, build a fence around it and post with "Keep Out" and "DangerManure Storage" signs.
5. Get help before attempting to rescue livestock that have fallen into a manure storage structure.
6. Build railings along all walkways or piers of open manure storage structures.
7. Permanent ladders on the outside of above-ground tanks should have locked entry guards or the ladder should not be able to be reached from the ground.
8. Never leave a ladder standing against an above-ground tank.
9. Construct permanent ladders on the inside wall of all pits and tanks, even if covered. Use noncorrosive material to prevent deterioration of the ladder.
10. Fence in earthen storage ponds and lagoons, and erect signs: "Danger Manure Storage." Additional precautions include a minimum of one lifesaving station equipped with a reaching pole and a ring buoy on a line.

11. All push-off platforms need a barrier strong enough to stop a slow-moving tractor.

12. If possible, remove animals from buildings before agitating manure stored in in-house pits. Otherwise:

    a. if the building is mechanically ventilated, turn fans on full capacity before starting agitation, or

    b. if the building is naturally ventilated, do not agitate unless there is a brisk breeze. Watch animals closely when beginning to agitate, and turn off the pump at the first sign of trouble.

13. If manure storage is outside the livestock building, use a water trap or other device to prevent gases from the storage structure from entering the building.

14. During agitation, if an animal becomes affected by toxic gases, do not try to rescue it. You might become a victim of toxic gases. Turn off the agitation pump, ventilate the building, and do not enter the building until gases have had a chance to escape.

15. Don't smoke, weld, or use an open flame in confined, poorly ventilated areas where methane can accumulate. Electric motors, fixtures, and wiring near manure storage structures should be kept in good condition to prevent a spark from igniting the methane.

16. Keep all guards and safety shields on all mechanical equipment such as pumps, manure spreaders, and irrigation equipment.

Vehicle Safety

Only employees with a current, valid NM driver's license should drive vehicles. In the case of specialized vehicles, only trained operators should operate the vehicles. The driver of the vehicle should inspect the vehicle prior to operating it.

1. All vehicles should be operated within the legal speed limit at all times or at a lower speed where conditions warrant.

2. Vehicles should not be used to transport unauthorized personnel.

3. The driver should be familiar with the capacity and required clearances for safe use of the vehicle.

4. Vehicle windshields and windows should be kept clear of obstructions.

5. Objects or persons being transported should be located so that they do not obstruct the driver's view.

6. Always know the proper operating procedures for each piece of equipment used.

Heavy Equipment Vehicles

1. Make sure that the air brake system (if present) has reached operating pressure before driving the vehicle.

2. Make sure everyone is clear of the vehicle before starting. Slight steering movement can occur as the engine starts causing machine movement.

3. Stay clear of the engine when it is running. Work on the engine only when it is off.

4. Do not move the steering wheel until everyone is clear of the vehicle.

Power Take-Off (PTO)

1. Refer to the safety section of owner's manual.

2. Stay clear of rear of vehicle during operation.

3. Do not wear loose fitting clothing, scarves, or jewelry that could get caught in the PTO.

4. Tie back long hair.

Hydraulic Systems

1. Do not open pressurized lines. Hydraulic fluid can cause severe burns, eye injury, or skin irritation.

2. Search for leaks in the line using a piece of cardboard or wood, not your hands.

3. If anyone is injured by hydraulic fluid, administer first aid, then contact a physician.

4. Stay clear of leaky hydraulic lines.

Electrical Safety

All employees must lock-out/tag-out any piece of equipment they are working on where the unexpected energization, startup, or release of stored energy could occur. In case of electrocution, turn off power to the electrical source or use an insulated implement, such as a piece of wood, to separate the victim from the source. Do not attempt to pull a victim away from the electrical source with your bare hands.

Responsibilities of the Site Supervisor

The following should be the responsibility of the site supervisor:
Establish and supervise an accident prevention program and a training program that is designed to improve the skills and competency of all employees in the field of occupational safety and health.

Conduct preliminary investigations to determine the cause of any accident that results in injury. The results of this investigation should be documented for reference.

Establish and maintain a system for maintaining records of occupational injuries and illnesses.

Provide new employees with a safety orientation on the special hazards and precautions of any new job.

Conduct job briefings with employees before starting any job to acquaint them with unfamiliar procedures.

Issue necessary safety equipment and manuals.

Conduct periodic group safety meetings with all employees.

The Safety Program should include:

- procedures for reporting injuries;
- procedures for reporting unsafe conditions or practices;
- use and care of personal protective equipment;
- proper actions to be taken in the event of emergencies;
- identification of hazardous gases, chemicals, or materials; and
- instructions on safe use of hazardous gases, chemicals, or materials and emergency procedures following exposure.

First Aid Training

There should be a person available at all times with first aid training in:

- bleeding control and bandaging
- artificial respiration, including mouth-to-mouth resuscitation
- poisons
- shock, unconsciousness, stroke
- burns
- sunstroke, heat exhaustion
- frostbite, hypothermia
- strains, sprains, hernia
- fractures, dislocations
- bites, stings
- transportation of the injured
- specific health hazards likely to be encountered by co-workers

There should be adequate, readily available first aid kits and supplies on site. Emergency telephone numbers must be posted by telephones.

Eyewash

Suitable facilities for quick drenching or flushing of the eyes and body should be provided in areas where the eyes or body of any person may be exposed to injurious chemicals and materials.

Responsibilities of the Employer (Safe Place Standards)

The following are the responsibility of the *employer*:

1. The employer should furnish to each of his employees a workplace free from recognized hazards that may cause serious injury or death.

2. The employer should furnish and use safety devices and practices that are reasonably adequate to render the employee workplace safe. The employer should do everything reasonably necessary to protect the life and safety of employees.

3. No employer should require an employee to be in any workplace that is not safe.

Responsibilities of the Employee

The following are the responsibility of the *employee*:

1. Each employee should keep themselves informed of the contents of the appropriate sections of this manual and any other safety manual provided by the employer and apply it to their work.

2. Each employee should perform their duties so as to provide safety to themselves and other employees.

3. An employee should request instruction from the site supervisor if there is a question as to the safe performance of an assigned task.

4. Each employee should wear clothing that is suitable for the job performed.

5. Each employee is responsible to report to the site supervisor any unsafe condition, acts, or hazards.

6. Each employee should wear appropriate personal protective equipment.

Personal Protective Equipment (PPE)

Employees should use the appropriate personal protective equipment, or protective devices, provided for their work. Before starting work, these items should be inspected by the employee to ensure that they are in safe operating condition. These items include, but are not limited to:

- Hard hats should be worn when appropriate.
- Hearing protection should be used, as needed, to reduce noise levels when working around generators and heavy equipment.
- Eye protection should be worn when operating shop tools, and when working around chemicals.
- Safety belts/seat belts should be worn at all times in vehicles.
- Approved welding goggles or helmets and gloves should be worn while welding, cutting, or both. Fasten clothing around the neck, wrists, and ankles.

Lifting and Carrying

Everyone should observe the following guidelines to avoid possible injury when lifting and carrying objects:

- Set your feet far enough apart to provide good balance and stability (approximately the width of your shoulders).
- Get as close to the load as practical, bending your legs at the knees, and bending at the hips to keep your back as straight as possible.
- Straighten your legs to lift the object, and at the same time bring your back to a vertical position.
- When lifting an object with another person, be sure that both individuals lift at the same time and let the load down together.
- Do not carry loads above people. Do not hoist, lower, or move any person with a crane by allowing them to stand on the hook, or by any nonapproved method.
- Do not stand under a suspended load or boom unless the nature of the work requires it.

Personal Hygiene

Wastewater contains pathogens (disease-causing organisms). Hence, good personal hygiene is very important!

1. Keep your hands away from your nose, mouth, eyes, and ears to avoid ingestion of wastewater.

2. Nonpermeable gloves should be worn when handling any equipment covered with wastewater or residuals.

3. Special care (e.g., protective, waterproof dressing) should be taken to keep any area of broken skin covered to avoid possible infection. If a worker suffers an injury which results in an open wound or laceration, they should be given a tetanus booster.

4. Wash hands thoroughly with soap before smoking, eating, drinking, or after work.

5. Work clothing should be changed and washed daily.

6. If contact with wastewater does occur, wash the area thoroughly with water and soap. Sponge any cuts with an antiseptic solution and cover with a clean, dry gauze dressing and waterproof adhesive.

Immunization

Each facility may want to consult a physician or the local health department to determine the need for immunizations for the employees working at the site. Adult tetanus and diphtheria should be given routinely every 10 years, or at shorter intervals when injury occurs.

Working in a Confined Space

A confined space is defined as a space that has limited means of entry and exit, has an adequate size and configuration for employee entry, and is not designed for continuous worker occupancy. Under new OSHA regulations, there are certain confined spaces that require a permit for entry. A permit-required confined space is defined as a confined space that has one or more of the following characteristics:

1. it contains or has the potential to contain a hazardous atmosphere;

2. it contains a material that has the potential for engulfing an entrant;

3. it has an integral configuration such that an entrant could be trapped or asphyxiated by inwardly-converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or

4. it contains any other recognized serious safety or health hazard.

If a facility has permit-required confined spaces, to be in compliance with the new OSHA regulations, a written confined space entry program must be developed and implemented. Enclosed facilities which are used to handle wastewater or wastewater solids, such as the tanks and/or tanker trucks, would fall under the permit-required confined space regulations. Do not enter a permit-required confined space without proper training, equipment, and support personnel. (*The confined space regulations can be found in the Code of Federal Regulations 29 CFR 1910.147.*)

When working in a space that does not require a confined space permit, the following safety actions must be taken:

1. Always assign a standby person to remain on the outside of the confined space. It is the standby person's responsibility to be in constant contact (visually, verbally, or both) with the workers inside the confined space as long as anyone is in the space.

2. Wear ear protection, as needed. Noise within a confined space can be amplified because of the design and acoustic properties of the space.

3. Use only an air-supplying respirator, such as a self-contained breathing apparatus (SCBA) or a supplied-air respirator with an auxiliary escape-only SCBA in confined spaces where there is insufficient oxygen.

Fire Prevention and Protection

It is important to be fire conscious in the outdoor environment. Employees should be knowledgeable of the fire conditions at the site and operate accordingly. Poor site maintenance, worn or defective electrical systems, and welding and cutting may contribute to dangerous situations. The following precautions should be observed:

1. Do not smoke near equipment or fuel trailers. No open flame should be allowed near wastewater storage tanks. Combustible gases can accumulate and when vented to the surrounding area, may become explosive.
2. Do not tamper with or remove fire-fighting equipment from designated locations for purposes other than fire-fighting or rescue operations. Access to fire equipment should not be hindered. If fire extinguishers are used, they should be promptly recharged. Inspect fire extinguishers monthly to be sure they are in good operating condition.

APPENDIX C

Example Forms

Schedule of Logs and Records

The logs and records located in this section are organized by reoccurring schedule. The as needed section is organized by order of most likely to used. Please refer to this table of contents to locate a particular form.

Daily	Water Line Inspection Log
Weekly	Process Water & Runoff Control Structure Water Level & Visual Inspection Log
Annually	Annual Soil Analysis Annual Dry Manure Nutrient Analysis Annual Process Water Analysis Planned On Site Process/Runoff Water & Manure Application Rate Calculation Year-end On Site Process/Runoff Water & Manure Application Rate Calculation Employee Training Record Annual Report to EPA
As Needed	On Site Process Water Land Irrigation Log Precipitation Log Maintenance Report Off Site Manure/Wastewater Removal On Site Manure Application Log Liner Maintenance Log Nutrient Management Plan (NMP) Amendments Spill Log Spill Incident Report Discharge Log Discharge Report (EPA) Discharge Report (State) Five Year Structural Controls Review

DAILY WATER LINE INSPECTION
LOG SHEET

Use this form to log your daily water line visual inspections. Initial the form each day after the inspection is done. Put a check mark in the leak detected column, if a leak is found during the inspection. If any leaks are found complete a maintenance report after repairing it.

Day	January, 20_____ Initials	if leaks are found	Day	February, 20_____ Initials	if leaks are found	Day	March, 20_____ Initials	if leaks are found
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
10			10			10		
11			11			11		
12			12			12		
13			13			13		
14			14			14		
15			15			15		
16			16			16		
17			17			17		
18			18			18		
19			19			19		
20			20			20		
21			21			21		
22			22			22		
23			23			23		
24			24			24		
25			25			25		
26			26			26		
27			27			27		
28			28			28		
29			29			29		
30						30		
31						31		

DAILY WATER LINE INSPECTION
LOG SHEET

Use this form to log your daily water line visual inspections. Initial the form each day after the inspection is done. Put a check mark in the leak detected column, if a leak is found during the inspection. If any leaks are found complete a maintenance report after repairing it.

Day	April, 20____ Initials	if leaks are found
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

Day	May, 20____ Initials	if leaks are found
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		

Day	June, 20____ Initials	if leaks are found
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

DAILY WATER LINE INSPECTION
LOG SHEET

Use this form to log your daily water line visual inspections. Initial the form each day after the inspection is done. Put a check mark in the leak detected column, if a leak is found during the inspection. If any leaks are found complete a maintenance report after repairing it.

Day	July, 20____ Initials	if leaks are found	Day	August, 20____ Initials	if leaks are found	Day	September, 20____ Initials	if leaks are found
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
10			10			10		
11			11			11		
12			12			12		
13			13			13		
14			14			14		
15			15			15		
16			16			16		
17			17			17		
18			18			18		
19			19			19		
20			20			20		
21			21			21		
22			22			22		
23			23			23		
24			24			24		
25			25			25		
26			26			26		
27			27			27		
28			28			28		
29			29			29		
30			30			30		
31			31					

DAILY WATER LINE INSPECTION
LOG SHEET

Use this form to log your daily water line visual inspections. Initial the form each day after the inspection is done. Put a check mark in the leak detected column, if a leak is found during the inspection. If any leaks are found complete a maintenance report after repairing it.

Day	October, 20____ Initials	if leaks are found	Day	November, 20____ Initials	if leaks are found	Day	December, 20____ Initials	if leaks are found
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
10			10			10		
11			11			11		
12			12			12		
13			13			13		
14			14			14		
15			15			15		
16			16			16		
17			17			17		
18			18			18		
19			19			19		
20			20			20		
21			21			21		
22			22			22		
23			23			23		
24			24			24		
25			25			25		
26			26			26		
27			27			27		
28			28			28		
29			29			29		
30			30			30		
31						31		

WEEKLY PROCESS WATER STORAGE (PWRS) AND RUNOFF CONTROL STRUCTURE (RCS) INSPECTIONS

Use this form to record weekly visual inspections of the process water storage structures and runoff control structures. This inspection is to include all process water management devices, runoff control diversions, retaining berms and channels used to direct contaminated storm water drainage or to divert off-site surface drainage away from the facility control systems. Conditions discovered needing repair or maintenance are to be noted. Complete a maintenance report and enter the date the condition was corrected. The areas to be visually inspected are listed below:

PWRS (maximum water level,) RCS (maximum water level, 1 ½ ft) Screen Separator Separator Drain Line Run-on Diversions

Erosion Controls Drainage Channels & Control Features

For the Year of 20____ Check the OK line if the visual inspection discovers no conditions needing repair or maintenance.

Date	Initials	Water Levels RCS,	PWRS,	OK	Inspection Notes Describe any problem(s) found and possible solution(s)	Date Corrected

WEEKLY PROCESS WATER STORAGE (PWRS) AND RUNOFF CONTROL STRUCTURE (RCS) INSPECTIONS

For the Year of 20____ Check the OK line if the visual inspection discovers no conditions needing repair or maintenance.

Date	Initials	Water Levels		OK	Inspection Notes	Date
		RCS,	PWRS,		Describe any problem(s) found and possible solution(s)	Corrected

ANNUAL SOIL ANALYSIS

The following is a log of the annual soil analysis. The annual soil analysis is to be taken as a composite soil sample, from each individual crop land area, owned or operated by the Dairy, where process water and/or manure solids are applied. If a map or layout drawing of the farm land owned or operated by the Dairy is available, it should be kept with this record and updated as needed. A copy of the soil analysis are to be placed immediately behind this log.

Date Sampled	Sampled By	Location of Sample

ANNUAL MANURE NUTRIENT ANALYSIS

The following is a log of the annual manure solids nutrient analysis. Annual N, P & K analysis of the manure solids generated at this facility has been completed by a qualified laboratory. The results of the analysis are made available to any hauler/spreader who is receiving manure from this facility. A copy is attached immediately behind this Log.

Date Sampled	Sampled By	Sample Location

ANNUAL PROCESS WATER ANALYSIS

The following is a log of the annual process water nutrient analysis. Annual N, P & K analysis of the process water generated at this facility has been completed by a qualified laboratory. The results of the analysis are made available to any hauler/spreader who is receiving wastewater from this facility. A copy is attached immediately behind this Log.

Date Sampled	**Sampled By**	**Sample Location**

Dairy Annual Nutrient Manager

Date	11/8/2009	NM STATE UNIVERSITY Dairy Extension Program dairy.NMSU.edu	Victor E. Cabrera Dairy Specialist dairy.nmsu.edu: Tools vcabrera@nmsu.edu		PLANNED		Nutrient Balance (lb)
Dairy				C	N Loss	38%	
Crop_Year					Goal/Real		Nutrient Needed
Field_ID							
Area (ac)							

	Month - Month	Crop	Unit	Yield	N	P
1st Crop				0	0	0
2nd Crop					0	0
3rd Crop					0	0
Total		Nutrient Needed			0	0

			Soil Analyses	
			N	P
Texture by Feel				
Nutrient Available in Soil		lb/ac	1	74
	Nutrient Still Needed		0	0

			Effluent Analyses	
			N	P
Effluent Manure Application		ac-in 0	0	0
		ac-in	0	0
		ac-in	0	0
	Nutrient Still Needed		0	0

			Manure Analyses	
			N	P
Dry Manure Application		t/ac	0	0
		t/ac	0	0
		t/ac	0	0
	Nutrient Still Needed		0	0

			Fertilizer Content	
			N	P
Chemical Fertilizers Applied		lb/ac	0	0
		lb/ac	0	0
		lb/ac	0	0
	Annual Nutrient Balance		**0**	**0**

Dairy Annual Nutrient Manager

Date	11/8/2009	NM STATE UNIVERSITY Dairy Extension Program dairy.NMSU.edu	Victor E. Cabrera Dairy Specialist dairy.nmsu.edu: Tools vcabrera@nmsu.edu	ACTUAL		Nutrient Balance (lb)	
Dairy					N Loss	38%	
Crop_Year					Goal/Real	Nutrient Needed	
Field_ID				C	Yield	N	P
Area (ac)							
	Month - Month	Crop		Unit			
1st Crop					0	0	0
2nd Crop						0	0
3rd Crop						0	0
Total		Nutrient Needed				0	0
						Soil Analyses	
Texture by Feel						N	P
Nutrient Available in Soil				lb/ac		1	74
		Nutrient Still Needed				0	0
						Effluent Analyses	
						N	P
Effluent Manure Application				ac-in	0	0	0
				ac-in		0	0
				ac-in		0	0
		Nutrient Still Needed				0	0
						Manure Analyses	
						N	P
Dry Manure Application				t/ac		0	0
				t/ac		0	0
				t/ac		0	0
		Nutrient Still Needed				0	0
						Fertilizer Content	
						N	P
Chemical Fertilizers Applied				lb/ac		0	0
				lb/ac		0	0
				lb/ac		0	0
		Annual Nutrient Balance				**0**	**0**

EMPLOYEE TRAINING

The following is a log of the employee training that has been conducted at this facility. This training is to provide guidance to those employees who have responsibilities in the proper operation, maintenance, spill response an record keeping at this facility.

Area of Training

Date	Employee	Spill/Discharge Response &	Control Structure Management	Possible Pollutant Storage	Record Keeping & Reporting	Land Application & Management

APPENDIX I. EXAMPLE NPDES CAFO PERMIT ANNUAL REPORT FORM

NPDES CAFO PERMIT ANNUAL REPORT

NPDES Permit Number:

Reporting period (mm/dd/yyyy - mm/dd/yyyy):
/ / – / /

Facility Name :

I. TYPE AND NUMBER OF ANIMALS

Report the maximum number of each type of animal confined at this facility at any one time.

Type	Number in Open Confinement	Number Housed Under Roof
Mature Dairy Cows		
Dairy Heifers		
Veal Calves		
Other Cattle		
Swine (55 lb. or more)		
Swine (under 55 lb.)		
Horses		
Sheep or Lambs		
Turkeys		
Chickens (broilers)		
Chickens (layers)		
Ducks		
Other: (specify) _____		

II. MANURE, LITTER, AND PROCESS WASTEWATER PRODUCTION

Report the estimated amount of manure, litter, and process wastewater that were generated at this facility in the 12-month period covered by this report.

A. Amount of manure generated in the 12-month period covered by this report. _____ (tons)

B. Amount of litter generated in the 12-month period covered by this report. _____ (tons)

C. Amount of process wastewater generated in the 12-month period covered by this report. _____ (gallons)

III. MANURE, LITTER, AND PROCESS WASTEWATER TRANSFERRED TO OTHER PERSONS

Report the estimated amount of manure, litter, and process wastewater that were transferred to other persons in the 12-month period covered by this report.

A. Amount of manure transferred in the 12-month period covered by this report. _____ (tons)

B. Amount of litter transferred in the 12-month period covered by this report. _____ (tons)

C. Amount of process wastewater transferred in the 12-month period covered by this report. _____ (gallons)

IV. LAND APPLICATION OF MANURE, LITTER, AND PROCESS WASTEWATER

A. Report the total number of acres of land that are covered by this facility's nutrient management plan. Include all land application acres covered by the nutrient management plan, whether or not they were used for land application during the 12-month period covered by this report.

Total number of land application acres covered by the nutrient management plan. _____ acres

B. Report the total number of acres of land where manure, litter, or process wastewater generated at this facility was spread. Include only land application areas that are under the control of this CAFO facility.

Total number of acres under the control of the CAFO used for land application in the 12-month period covered by this report. _____ acres

V. SUMMARY OF DISCHARGES

Provide a summary of each discharge of manure, litter, and/or process wastewater from the production area(s) that occurred in the 12-month period covered by this report. Attach additional sheets, if needed.

Date[a]	Time[b]	Location[c,f]	Description[d,f]	Volume[e]

[a] **Date:** The date of the discharge. If the discharge was detected after it happened, give an estimate of the date when the discharge occurred.
[b] **Time:** The time of the discharge. If the discharge was detected after it happened, give an estimate of the time when the discharge occurred.
[c] **Location:** The location of the discharge to waters of the U.S. Be specific. Include the name of the water body, and a specific description of where the manure, litter, or process wastewater entered the water body. Include landmarks or other points of reference (e.g., Three Mile Creek, at southeast corner of feedlot where creek bends to the west).
[d] **Description:** Provide other relevant information about the discharge, including the source, cause, composition (e.g., emergency overflow of process wastewater from lagoon #2), and impacts observed (e.g., fish kill in waterbody).
[e] **Volume:** Give an estimate of the number of gallons or tons of manure, litter, or process wastewater discharged.
[f] This information is not required by the NPDES CAFO regulations to be included in the annual report.

VI. NUTRIENT MANAGEMENT PLAN

Indicate whether the facility's nutrient management plan was either developed or approved by a certified nutrient management planner. Note: The *[permitting authority]* does not require CAFO owners or operators to use a certified nutrient management planner to prepare or approve nutrient management plans.

Was the current version of this facility's nutrient management plan prepared or approved by a certified nutrient management planner? ❑ Yes ❑ No

VII. INSTANCES OF NONCOMPLIANCE NOT PREVIOUSLY REPORTED

During the past 12 months have there been any instances of noncompliance which have not been reported to the permitting authority? ❑ Yes ❑ No If yes, please provide the information requested below.

If during the past 12 months there been instances of noncompliance which have not been reported to the permitting authority please provide the following information, for each instance, along with this annual report:

- ❑ Description of the noncompliance and its cause.
- ❑ The period that the operation was in noncompliance with permit conditions, including exact dates and times.
- ❑ In those cases where the noncompliance has not been corrected, the anticipated time it is expected to continue.
- ❑ Description of the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance

VIII. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: _____

Print Name: _____

Submit by *[insert due date/reporting schedule]*
Submit to *[permitting authority and address]*

ON SITE PROCESS WATER IRRIGATION LOG

The following is a log of the on site (on crop land owned and/or operated by this CAFO) irrigation of wastewater generated at this facility. A map identifying each field is behind this log for reference. An application rate calculation is completed annually for each individual field, once at the beginning of the crop year to establish the estimated nutrient balance application rates and once at the end of the crop year to document the actual nutrient application rate. For application rate calculations, refer to the NMSU calculation work sheets. Describe weather conditions as "clear" "dry" "cloudy" or such.

Date	**Field**	**Meter Reading**		**Weather Conditions**		
		Start	End	24 Hours Before	During	24 Hours After

PRECIPITATION (RAINFALL/SNOWFALL) LOG

The following is a record of all measurable precipitation which has occurred at this facility. Measured amounts cover a 24 hour period.

Record measurable rainfall in inches and record snowfall as "wet" or "dry" in approximate flat fall inches.

Year _____

Precipitation Rainfall/Snowfall Inches

Date	Rainfall	Snowfall

Year _____

Precipitation Rainfall/Snowfall Inches

Date	Rainfall	Snowfall

Maintenance or Modification Activity Record

The facility operator will complete the following report to briefly describe and record any significant repairs or modifications to the pollution prevention system. Any modifications that improve the performance of the system will be recorded here. Any significant modifications that change the way the system works will also be recorded as an amendment to this plan. This activity report will be filed immediately behind D.3.A.

Date or period in which maintenance was performed _____

Did the maintenance leave the system component in proper working condition? Yes____ No____ NA____

Briefly describe the system component or structural control that received maintenance or improvement:

_____

Briefly describe the maintenance preformed on the system component:

_____

_____

_____

_____

_____

_____

_____

_____

OFF SITE MANURE/WASTEWATER TRANSFER

Recipient List

The following is a list of recipients that receive manure solids or wastewater from this facility. manure solids that have been sold or given to other persons. This record is to be up-dated as needed to add new recipients and to keep the information current.

Recipients taking insignificant (ie. pickup or small trailer loads) need not be recorded.

Name	Address	Annual Analysis Provided				
		2010	2011	2012	2013	2014

OFF SITE MANURE/WASTEWATER TRANSFER

The following is a log of the removal of manure solids that have been sold or given to other persons. The amount is recorded in estimated or scaled tons, or in cubic yards. Recipients removing significant amounts of manure solids or wastewater must provide their name and address for your records. Insignificant (ie. pickup or small trailer loads) need not be recorded.

A computer record may be used in substitute for this written record. If using a computer record the same information is needed. Note on this record that a computer file is being maintained.

Date(s)	**Recipient**	**Amount Removed (ton/cu-yd/gallons/ac-ft)**

ON SITE DRY MANURE APPLICATION

The following is a log of the on site (on crop land owned and/or operated by this CAFO) use of manure solids generated at this facility. A map identifying each field is behind this log for reference. An application rate calculation is completed annually for each individual field, once at the beginning of the crop year to establish the estimated nutrient balance application rates and once at the end of the crop year to document the actual nutrient application rate. For application rate calculations, refer to the NMSU calculation work sheets. Describe weather conditions as “clear” “dry” “cloudy” or such.

Date	Field	Tons/Acre	Weather Conditions		
			24 Hours Before	During	24 Hours After

LINER MAINTENANCE

The following is a log of liner maintenance that has been preformed on the retention structures at this facility. Any activity required to restore the PWRS or RCS liner will be inspected by a professional engineer or NRCS engineer. At least every 5 years a review of this maintenance record and a site evaluation will be conducted by a professional engineer or NRCS engineer.

Date Completed	**Cause of Damage**	**Corrective Action Taken**	**Inspector**

NUTRIENT MANAGEMENT PLAN (NMP) AMENDMENTS

The following is a log of the amendments to the NMP for this facility. Details of the amendments will be attached directly behind this log.

Date	Description of NMP Change(s)

SPILLS

The following is a log of the significant spills of possible pollutants that have occurred at this facility. Refer to the Spill Clean Up Report immediately behind this log, for additional details.

Date of Spill	Material Spilled	Clean Up Completed	
		Yes	No

Spill Incident Report
For
A Possible Pollutant Source Material

The following spill incident report is to be completed to document the circumstances and actions taken regarding a significant spill of a Possible Pollutant Source Material.

Date of the Spill _____

Location on the Facility _____

Material Spilled _____

Amount of Material Spilled _____gallons/pounds

Was the Material Contained and/or Cleaned Up? Yes____ No____
If yes, provide a brief description of the containment and/or clean up.

_____
_____
_____

Did the Spilled Material Enter a Water of the US? Yes____ No____
If yes, provide a brief description of the flow path and the water polluted.

_____
_____
_____

Was Any Action Taken to Prevent Future Spills of This Type? Yes____ No____
If yes, briefly describe the preventive action.

_____
_____
_____

I _____completed this spill incident report. _____
Print Name Signature

FIVE YEAR STRUCTURAL CONTROLS REVIEW

Facility Operators Log of Five (5) Year Structural Inspections and/or Re-Certification; For Additional Information Refer to the Facility Design Section of this document.

Date of Inspection	Inspectors Name	Follow Up Needed
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____
_____	_____	Yes_____ No_____

Tables and Calculations

Table 2.3

Facility: River Valley Dairy, LLC

Crop Land Inventory

Field ID	No. Acres	Basis for Application	Irrigated Yes	Irrigated No	Type of Irrigation	Crops Grown in Winter	Crops Grown in Summer	Conservation Practices Yes	Conservation Practices No
Field A (LAA-A)	15	Nitrogen	X		Flooded Row or Border	X	X	X	
Field B (LAA-B)	32	Nitrogen	X		Flooded Row or Border	X	X	X	
Field C (LAA-C)	29	Nitrogen	X		Flooded Row or Border	X	X	X	
Field D (LAA-D)	21	Nitrogen	X		Flooded Row or Border	X	X	X	

Flooded Row irrigation is used on row crops like corn
Flooded Border irrigation is used on small grains and grasses; a border covers 2 to 4 acres.

Table 10.2

Facility: River Valley Dairy, LLC

Crop Rotation and Yield[1] Projections

		Field A		Field B		Field C		Field D	
	Year	Crop	Yield	Crop	Yield	Crop	Yield	Crop	Yield
1)	2009 Winter	Triticale	10 t/ac	Triticale	10 t/ac	Triticale	10 t/ac	Triticale	10 t/ac
	2010 Summer	Sorg/Sudan	16 t/ac	Sorg/Sudan	16 t/ac	Sorg/Sudan	16 t/ac	Sorg/Sudan	16 t/ac
2)	2010 Winter	Wheat	10 t/ac	Wheat	10 t/ac	Wheat	10 t/ac	Wheat	10 t/ac
	2011 Summer	Corn	24 t/ac	Corn	24 t/ac	Corn	24 t/ac	Corn	24 t/ac
3)	2011 Winter	Barley	10 t/ac	Barley	10 t/ac	Barley	10 t/ac	Barley	10 t/ac
	2012 Summer	Corn	24 t/ac	Corn	24 t/ac	Corn	24 t/ac	Corn	24 t/ac
4)	2012 Winter	Oats	10 t/ac	Oats	10 t/ac	Oats	10 t/ac	Oats	10 t/ac
	2013 Summer	Sorg/Sudan	16 t/ac	Sorg/Sudan	16 t/ac	Sorg/Sudan	16 t/ac	Sorg/Sudan	16 t/ac
5)	2013 Winter	Alfalfa		Alfalfa		Alfalfa		Alfalfa	
	2014 Summer	Alfalfa	10 t/ac	Alfalfa	10 t/ac	Alfalfa	10 t/ac	Alfalfa	10 t/ac

[1] Yield projections are in tons per acre of silage, except for alfalfa which is in annual tons per acre dry baled hay.

Table 10.8

Facility: River Valley Dairy, LLC

Total Nutrient[1] Applied All Sources

	Crop in the Projected Rotation[2]						
Field ID	Alfalfa[3]	Barley	Corn	Oats	Sorghum/Sudan	Triticale	Wheat
Field A (LAA-A)	302.5 #/ac[4]	136.7 #/ac	189.8 #/ac	122.5 #/ac	157.2 #/ac	140.2 #/ac	140.2 #/ac
Field B (LAA-B)	302.5 #/ac[4]	136.7 #/ac	189.8 #/ac	122.5 #/ac	157.2 #/ac	140.2 #/ac	140.2 #/ac
Field C (LAA-C)	302.5 #/ac[4]	136.7 #/ac	189.8 #/ac	122.5 #/ac	157.2 #/ac	140.2 #/ac	140.2 #/ac
Field D (LAA-D)	302.5 #/ac[4]	136.7 #/ac	189.8 #/ac	122.5 #/ac	157.2 #/ac	140.2 #/ac	140.2 #/ac

1 All fields at this facility are N based for crop nutrient rate projections. Total nutrients are in PAN Nitrogen.

2 See Table 10.2 for year-by-year projections on an annual crop rotation basis.

3 USDA-NRCS Plants Nutrient Tool for alfalfa shows 503.935 #N/ac at 10 ton/acre yield. NRCS Standard Practice 590, Appendix D to the Permit adjusts N application to legumes to 60% of the nutrient removal.

4 Total plant available nitrogen (PAN) to be applied from all sources is taken from USDA-NRCS Plants Nutrient Tool. Also refer to NMSU Annual Nutrient Management worksheet in Appendix A.

River Valley Dairy, LLC --- Annual Manure Production Estimates

WORKSHEET I. MANURE PRODUCTION DATA FOR COLLECTABLE MANURE

TYPE OF ANIMAL (Dairy=0, Swine=1, Laying Hens=2, Beef Feedlot=3, Sheep Feedlot=4, Horses=5, Turkeys=6, Broilers=7) => 0

Manure Production Criteria for Dairy Feeding Facilities

Parameters	Buildings, Concrete Pens & Alleys	Open Lots	Total
#1. Number of Animals	2500	2500	MILKING
#2. Average Liveweight per Head, lbs/hd	1300	1300	
#3. Total Liveweight,lbs (#1 x #2)	3250000	3250000	
#4. Confinement Period, hours/day	2	22	24
#5. Confinement Period, fraction (#4/24)	0.08	0.92	1.00
#6. Adjusted Total Liveweight, lbs (#3 x #5)	270833	2979167	3250000
#7. Wet Manure Production, lbs/day	27625	303875	331500
#8. Dry Manure Production, lbs/day	3981	43794	47775
#9. Dry Manure Production, tons/year	727	7992	8719
#10 .Volatile Solids (VS) Production, lbs/day	2922	32145	35068
#11 .Total Nitrogen Production, lbs/day	148	1630	1778
#12 .Total Phosphorus (P2O5), lbs/day	73	804	878
#13 .Total Potassium (K2O), lbs/day	125	1379	1505
#14 .Sodium Production, lbs/day	21	232	254
#15 .COD Production, lbs/day	3629	39921	43550
#16.BOD5 Production, lbs/day	563	6197	6760

River Valley Dairy, LLC --- Annual Manure Production Estimates

WORKSHEET I. MANURE PRODUCTION DATA FOR COLLECTABLE MANURE

TYPE OF ANIMAL (Dairy=0, Swine=1, Laying Hens=2, Beef Feedlot=3, Sheep Feedlot=4, Horses=5, Turkeys=6, Broilers=7) => 0

Manure Production Criteria for	Dairy Feeding Facilities		
Parameters	Buildings, Concrete Pens & Alleys	Open Lots	Total
#1. Number of Animals	0	500	500 DRY
#2. Average Liveweight per Head, lbs/hd	0	1500	
#3. Total Liveweight,lbs (#1 x #2)	0	750000	
#4. Confinement Period, hours/day	0	24	24
#5. Confinement Period, fraction (#4/24)	0.00	1.00	1.00
#6. Adjusted Total Liveweight, lbs (#3 x #5)	0	750000	750000
#7. Wet Manure Production, lbs/day	0	76500	76500
#8. Dry Manure Production, lbs/day	0	11025	11025
#9. Dry Manure Production, tons/year	0	2012	2012
#10 .Volatile Solids (VS) Production, lbs/day	0	8093	8093
#11 .Total Nitrogen Production, lbs/day	0	410	410
#12 .Total Phosphorus (P2O5), lbs/day	0	203	203
#13 .Total Potassium (K2O), lbs/day	0	347	347
#14 .Sodium Production, lbs/day	0	59	59
#15 .COD Production, lbs/day	0	10050	10050
#16.BOD5 Production, lbs/day	0	1560	1560

River Valley Dairy, LLC --- Annual Manure Production Estimates

WORKSHEET 1. MANURE PRODUCTION DATA FOR COLLECTABLE MANURE

TYPE OF ANIMAL (Dairy=0, Swine=1, Laying Hens=2, Beef Feedlot=3, Sheep Feedlot=4, Horses=5, Turkeys=6, Broilers=7) => 0

Manure Production Criteria for	Dairy Feeding Facilities		
Parameters	Buildings, Concrete Pens & Alleys	Open Lots	Total
#1. Number of Animals	0	1500	HEIFERS
#2. Average Liveweight per Head, lbs/hd	0	800	
#3. Total Liveweight,lbs (#1 x #2)	0	1200000	
#4. Confinement Period, hours/day	0	24	24
#5. Confinement Period, fraction (#4/24)	0.00	1.00	1.00
#6. Adjusted Total Liveweight, lbs (#3 x #5)	0	1200000	1200000
#7. Wet Manure Production, lbs/day	0	122400	122400
#8. Dry Manure Production, lbs/day	0	17640	17640
#9. Dry Manure Production, tons/year	0	3219	3219
#10 .Volatile Solids (VS) Production, lbs/day	0	12948	12948
#11 .Total Nitrogen Production, lbs/day	0	656	656
#12 .Total Phosphorus (P2O5), lbs/day	0	324	324
#13 .Total Potassium (K2O), lbs/day	0	556	556
#14 .Sodium Production, lbs/day	0	94	94
#15 .COD Production, lbs/day	0	16080	16080
#16.BOD5 Production, lbs/day	0	2496	2496

River Valley Dairy, LLC --- Annual Manure Production Estimates

WORKSHEET I. MANURE PRODUCTION DATA FOR COLLECTABLE MANURE

TYPE OF ANIMAL (Dairy=0, Swine=1, Laying Hens=2, Beef Feedlot=3, Sheep Feedlot=4, Horses=5, Turkeys=6, Broilers=7) => 0

Manure Production Criteria for	Dairy Feeding Facilities		
Parameters	Buildings, Concrete Pens & Alleys	Open Lots	Total
#1. Number of Animals	0	1000	Baby calves
#2. Average Liveweight per Head, lbs/hd	0	200	
#3. Total Liveweight,lbs (#1 x #2)	0	200000	
#4. Confinement Period, hours/day	0	24	24
#5. Confinement Period, fraction (#4/24)	0.00	1.00	1.00
#6. Adjusted Total Liveweight, lbs (#3 x #5)	0	200000	200000
#7. Wet Manure Production, lbs/day	0	20400	20400
#8. Dry Manure Production, lbs/day	0	2940	2940
#9. Dry Manure Production, tons/year	0	537	537
#10 .Volatile Solids (VS) Production, lbs/day	0	2158	2158
#11 .Total Nitrogen Production, lbs/day	0	109	109
#12 .Total Phosphorus (P2O5), lbs/day	0	54	54
#13 .Total Potassium (K2O), lbs/day	0	93	93
#14 .Sodium Production, lbs/day	0	16	16
#15 .COD Production, lbs/day	0	2680	2680
#16.BOD5 Production, lbs/day	0	416	416

Annual Process Wastewater Generated

Facility:	River Valley Dairy	
NMED DP-167	Authorized wastewater rate	35,000 gallon per day

35.000 gpd X 365 days / 325,850 = 39.21 acre-feet or 470.46 acre-inches

Figures