F. Jobsheets and Specifications

- Available job sheets and specifications applicable to the producer's specific planned practices.
- Worksheets developed with producer, such as resource impact summaries, forage inventories, erosion estimates, and cost estimates.

DA NRCS Natural Resources Conservation Service

RUSLE2 Profile Erosion Calculation Record

Info:

File: Plan: Profile (Temp. scenario[1]) of CottonwoodSprings-Field1
Access Group: R2_NRCS_Fld_Office

Inputs:
Location: New Mexico\Eddy County\NM_Eddy_R20-22
Soil: Rc REAGAN LOAM, 0 TO 1 PERCENT SLOPES\Reagan loam 100%
Slope length (horiz): 1000 ft
Avg. slope steepness: 1.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
temp\alfalfa 5 yr-Oat hay	Alfalfa, South, fall seed senes to yr2 regrowth	tons	1.0
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr2 regrowth after cutting	tons	1.5
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr2 regrowth after cutting	tons	1.5
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr2 senes to yr3 regrowth	tons	1.0
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr3 regrowth after cutting	tons	1.7
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr3 regrowth after cutting	tons	1.7
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr3 senes to yr4 regrowth	tons	1.0
mp\alfalfa 5 yr-Oat hay	Alfalfa, yr4 regrowth after cutting	tons	1.8
mp\alfalfa 5 yr-Oat hay	Alfalfa, yr4 regrowth after cutting	tons	1.8
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr4 senes to yr5 regrowth	tons	1.0
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr4 regrowth after cutting	tons	1.8
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr4 regrowth after cutting	tons	1.8
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr4 senes to yr5 regrowth	tons	1.0
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr4 regrowth after cutting	tons	1.8
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr4 regrowth after cutting	tons	1.8
temp\alfalfa 5 yr-Oat hay	Alfalfa, yr4 senes to yr5 regrowth	tons	1.0
temp\alfalfa 5 yr-Oat hay	Oats, spring hay	tons	4.0

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Subsurface drainage: (none)
Adjust res. burial level: Normal res. burial
General yield level: Set by user
Rock cover: 0 %

Irrigation Inputs (for first management): managements\temp\alfalfa 5 yr-Oat hay
Inputs for irrigation by application rate:

--

Inputs for irrigation by application depth:

--

uts for irrigation by month:

-

tputs:
value: 5.0 t/ac/yr
Soil loss erod. portion: 0.58 t/ac/yr
Detachment on slope: 0.58 t/ac/yr
Soil loss for cons. plan: 0.58 t/ac/yr
Sediment delivery: 0.58 t/ac/yr
Net C factor: 0.12
Net K factor: 0.32

Crit. slope length: -- ft
Surf. cover after planting: -- %

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
6/30/0	Plow, moldboard		1.1
7/1/0	Disk, tandem light finishing		1.1
7/5/0	Cultivator, field w/ spike points		2.2
7/15/0	Drill or airseeder, double disk	Alfalfa, South, fall seed senes to yr2 regrowth	1.7
6/1/1	Harvest, hay, legume	Alfalfa, yr2 regrowth after cutting	15
7/15/1	Harvest, hay, legume	Alfalfa, yr2 regrowth after cutting	28
9/1/1	Harvest, hay, legume	Alfalfa, yr2 senes to yr3 regrowth	33
6/1/2	Harvest, hay, legume	Alfalfa, yr3 regrowth after cutting	26
7/15/2	Harvest, hay, legume	Alfalfa, yr3 regrowth after cutting	36
9/1/2	Harvest, hay, legume	Alfalfa, yr3 senes to yr4 regrowth	38
6/1/3	Harvest, hay, legume	Alfalfa, yr4 regrowth after cutting	28
7/15/3	Harvest, hay, legume	Alfalfa, yr4 regrowth after cutting	38
9/1/3	Harvest, hay, legume	Alfalfa, yr4 senes to yr5 regrowth	40
6/1/4	Harvest, hay, legume	Alfalfa, yr4 regrowth after cutting	29
7/15/4	Harvest, hay, legume	Alfalfa, yr4 regrowth after cutting	38
9/1/4	Harvest, hay, legume	Alfalfa, yr4 senes to yr5 regrowth	40
6/1/5	Harvest, hay, legume	Alfalfa, yr4 regrowth after cutting	29
7/15/5	Harvest, hay, legume	Alfalfa, yr4 regrowth after cutting	38
9/1/5	Harvest, hay, legume	Alfalfa, yr4 senes to yr5 regrowth	40
3/1/6	Plow, moldboard		0.66
3/15/6	Disk, tandem secondary op.		1.4
3/16/6	Cultivator, field w/ spike points		1.5
3/17/6	Drill or airseeder, double disk	Oats, spring hay	1.3
6/15/6	Harvest, hay, no regrowth		24

Soil conditioning index (SCI): 0.37
Avg. annual slope STIR: 43
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The STIR value is the Soil Tillage Intensity Rating. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

NRCS Natural Resources Conservation Service

Irrigation Water Management
Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: Mr. Phil Troost **Tract:** 839
Planner: Reddy Ganta **Field(s) No.:** 1
Current Land Use: Cropland **Total Acres:** 18
Date: 11/20/2009 **Date to apply:** ########

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: Reagan L; RA, Rc, Rd, & RE — Intake Family (in/hr): 0.50

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; Artesia	Deep	4.0	6.6	50%	3.3	4.1
Grain, spring; Artesia	Medium	3.0	5.0	50%	2.5	2.7

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

Crop:	Alfalfa, hay, southern; Artesia		Total Irrigation Needed:	42.5 ac in/ac	
Month	Est. Frequency *(days between irr.)*	In/Mo	Month	Est. Frequency *(days between irr.)*	In/Mo
Jan		0.0	Jul	11	9.0
Feb		0.0	Aug	14	7.2
Mar	>1 Mo.	0.8	Sep	22	4.5
Apr	27	3.7	Oct	>1 Mo.	2.8
May	16	6.2	Nov	>1 Mo.	0.3
Jun	12	8.0	Dec		0.0

Crop:	Grain, spring; Artesia		Total Irrigation Needed:	11.2 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	29	2.6	Sep		0.0
Apr	16	4.8	Oct		0.0
May	20	3.8	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: **Sprinkler, handline or wheelline** System Efficiency (%): **80%**

System Capacity (Ditch/Pump/Well): **800** GPM

Crop Grown	Days of Operation for CU by crop (days)	Est. System Applicaiton Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Alfalfa, hay, southern; Artesia	23	1.90	0.30	System meets CU for crop
Grain, spring; Artesia	6	1.90	0.16	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:** _____

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

NRCS Natural Resources Conservation Service

Irrigation Water Management

Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: Mr. Phil Troost **Tract:**
Planner: Reddy Ganta **Field(s) No.:** 2
Current Land Use: Cropland **Total Acres:** 52
Date: 11/20/2009 **Date to apply:** ########

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
- [x] Optimize use of water
- [ ] Minimize Irrigation Erosion
- [x] 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: Reagan L; RA, Rc, Rd, & RE — Intake Family (in/hr): 0.50

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)
Pasture, cool season grass; Carlsbad	Medium	3.0	5.0	50%	2.5	2.7
Wheat, winter, silage; Deming	Medium	3.0	5.0	50%	2.5	2.7

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

Crop: Pasture, cool season grass; Carlsbad — **Total Irrigation Needed:** 25.8 ac in/ac

Month	Est. Frequency *(days between irr.)*	In/Mo	Month	Est. Frequency *(days between irr.)*	In/Mo
Jan		0.0	Jul	14	5.4
Feb		0.0	Aug	18	4.3
Mar	>1 Mo.	0.4	Sep	26	2.9
Apr	>1 Mo.	2.5	Oct	>1 Mo.	1.4
May	19	4.0	Nov		0.0
Jun	15	5.0	Dec		0.0

Crop: Wheat, winter, silage; Deming — **Total Irrigation Needed:** 13.6 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	>1 Mo.	0.2	Aug		0.0
Mar	>1 Mo.	2.1	Sep		0.0
Apr	18	4.2	Oct		0.0
May	11	7.2	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: Sprinkler, handline or wheelline — System Efficiency (%): 80%

System Capacity (Ditch/Pump/Well): 800 GPM

Crop Grown	Days of Operation for CU by crop (days)	Est. System Applicaiton Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Pasture, cool season grass; Carlsba	40	0.66	0.18	System meets CU for crop
Wheat, winter, silage; Deming	21	0.66	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:** _____

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

NRCS Natural Resources Conservation Service

Irrigation Water Management
Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: Mr. Phil Troost **Tract:**
Planner: Reddy Ganta **Field(s) No.:** 3
Current Land Use: Cropland **Total Acres:** 30
Date: 11/20/2009 **Date to apply:** ########

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:	Reagan L; RA, Rc, Rd, & RE	Intake Family (in/hr):	0.50

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)
Pasture, cool season grass; Artesia MA	Medium	3.0	5.0	50%	2.5	2.7

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

Crop:	Pasture, cool season grass; Artesia MA		Total Irrigation Needed:	25.8 ac in/ac	
Month	**Est. Frequency** *(days between irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between irr.)*	**In/Mo**
Jan		0.0	Jul	14	5.4
Feb		0.0	Aug	18	4.3
Mar	>1 Mo.	0.4	Sep	26	2.9
Apr	>1 Mo.	2.5	Oct	>1 Mo.	1.4
May	19	4.0	Nov		0.0
Jun	15	5.0	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

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: Sprinkler, handline or wheelline — System Efficiency (%): 80%

System Capacity (Ditch/Pump/Well): 800 GPM

Crop Grown	Days of Operation for CU by crop (days)	Est. System Applicaiton Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Pasture, cool season grass; Artesia	23	1.14	0.18	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:** _____

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

NRCS Natural Resources Conservation Service

Irrigation Water Management
Conservation Practice Job Sheet 449
Natural Resources Conservation Service (NRCS) Jan, 2006

Client: Mr. Phil Troost
Planner: Reddy Ganta
Current Land Use: Cropland
Date: 11/20/2009
Tract: 763
Field(s) No.: 4
Total Acres: 120
Date to apply: ########

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:	Reagan L; RA, Rc, Rd, & RE	Intake Family (in/hr):	0.50

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, grain; Carlsbad	Medium	3.0	5.0	50%	2.5	2.7
Corn, grain; Deming	Medium	3.0	5.0	50%	2.5	2.7

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

Crop:	Wheat, winter, grain; Carlsbad		Total Irrigation Needed:	13.0 ac in/ac	
Month	Est. Frequency *(days between irr.)*	In/Mo	Month	Est. Frequency *(days between irr.)*	In/Mo.
Jan	>1 Mo.	0.9	Jul		0.0
Feb	>1 Mo.	1.7	Aug		0.0
Mar	20	3.7	Sep		0.0
Apr	14	5.3	Oct		0.0
May		0.0	Nov	>1 Mo.	0.6
Jun		0.0	Dec	>1 Mo.	0.7

Crop:	Corn, grain; Deming		Total Irrigation Needed:	32.6 ac in/ac	
Month	Est. Frequency *(days between irr.)*	In/Mo	Month	Est. Frequency *(days between irr.)*	In/Mo.
Jan		0.0	Jul	9	8.4
Feb		0.0	Aug	10	7.5
Mar		0.0	Sep	14	5.3
Apr	>1 Mo.	0.5	Oct	>1 Mo.	1.0
May	22	3.5	Nov		0.0
Jun	12	6.5	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:	Sprinkler, handline or wheelline	System Efficiency (%):	80%
System Capacity (Ditch/Pump/Well):	1000	GPM	

Crop Grown	Days of Operation for CU by crop (days)	Est. System Applicaiton Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Wheat, winter, grain; Carlsbad	37	0.36	0.18	System meets CU for crop
Corn, grain; Deming	92	0.36	0.28	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:** _____

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

NRCS Natural Resources Conservation Service

Irrigation Water Management
Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: Mr. Phil Troost **Tract:** 839
Planner: Reddy Ganta **Field(s) No.:** 5
Current Land Use: Cropland **Total Acres:** 85
Date: 11/20/2009 **Date to apply:** ########

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: Reagan L; RA, Rc, Rd, & RE — Intake Family (in/hr): 0.50

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; Artesia	Deep	4.0	6.6	50%	3.3	4.1
Grain, spring; Artesia	Medium	3.0	5.0	50%	2.5	2.7

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

Crop: Alfalfa, hay, southern; Artesia — **Total Irrigation Needed:** 42.5 ac in/ac

Month	Est. Frequency *(days between irr.)*	In/Mo	Month	Est. Frequency *(days between irr.)*	In/Mo
Jan		0.0	Jul	11	9.0
Feb		0.0	Aug	14	7.2
Mar	>1 Mo.	0.8	Sep	22	4.5
Apr	27	3.7	Oct	>1 Mo.	2.8
May	16	6.2	Nov	>1 Mo.	0.3
Jun	12	8.0	Dec		0.0

Crop: Grain, spring; Artesia — **Total Irrigation Needed:** 11.2 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	29	2.6	Sep		0.0
Apr	16	4.8	Oct		0.0
May	20	3.8	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:	Sprinkler, handline or wheelline	System Efficiency (%):	80%
System Capacity (Ditch/Pump/Well):	800	GPM	

Crop Grown	Days of Operation for CU by crop (days)	Est. System Applicaiton Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Alfalfa, hay, southern; Artesia	106	0.40	0.30	System meets CU for crop
Grain, spring; Artesia	28	0.40	0.16	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:** _____

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

NRCS Natural Resources Conservation Service

Irrigation Water Management
Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: Mr. Phil Troost **Tract:**
Planner: Reddy Ganta **Field(s) No.:** 6
Current Land Use: Cropland **Total Acres:** 36
Date: 11/20/2009 **Date to apply:** 9/1/2006

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: Reagan L; RA, Rc, Rd, & RE — Intake Family (in/hr): 0.50

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; Artesia	Deep	4.0	6.6	50%	3.3	4.1
Grain, spring; Artesia	Medium	3.0	5.0	50%	2.5	2.7

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

Crop: Alfalfa, hay, southern; Artesia — **Total Irrigation Needed:** 42.5 ac in/ac

Month	Est. Frequency *(days between irr.)*	In/Mo	Month	Est. Frequency *(days between irr.)*	In/Mo
Jan		0.0	Jul	11	9.0
Feb		0.0	Aug	14	7.2
Mar	>1 Mo.	0.8	Sep	22	4.5
Apr	27	3.7	Oct	>1 Mo.	2.8
May	16	6.2	Nov	>1 Mo.	0.3
Jun	12	8.0	Dec		0.0

Crop: Grain, spring; Artesia — **Total Irrigation Needed:** 11.2 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	29	2.6	Sep		0.0
Apr	16	4.8	Oct		0.0
May	20	3.8	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: Sprinkler, handline or wheelline — System Efficiency (%): 80%

System Capacity (Ditch/Pump/Well): 800 GPM

Crop Grown	Days of Operation for CU by crop (days)	Est. System Applicaiton Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Alfalfa, hay, southern; Artesia	45	0.95	0.30	System meets CU for crop
Grain, spring; Artesia	12	0.95	0.16	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:** _____

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

NRCS Natural Resources Conservation Service

Irrigation Water Management

Conservation Practice Job Sheet 449

Natural Resources Conservation Service (NRCS) Jan, 2006

Client: Mr. Phil Troost **Tract:**
Planner: Reddy Ganta **Field(s) No.:** 7
Current Land Use: Cropland **Total Acres:** 40
Date: 11/20/2009 **Date to apply:** ########

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
- [x] Optimize use of water
- [ ] Minimize Irrigation Erosion
- [x] 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:	Reagan L; RA, Rc, Rd, & RE	Intake Family (in/hr):	0.50

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, grain; Carlsbad	Medium	3.0	5.0	50%	2.5	2.7
Corn, grain; Deming	Medium	3.0	5.0	50%	2.5	2.7

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

Crop:	Wheat, winter, grain; Carlsbad		Total Irrigation Needed:	13.0 ac in/ac	
Month	**Est. Frequency** *(days between Irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between Irr.)*	**In/Mo**
Jan	>1 Mo.	0.9	Jul		0.0
Feb	>1 Mo.	1.7	Aug		0.0
Mar	20	3.7	Sep		0.0
Apr	14	5.3	Oct		0.0
May		0.0	Nov	>1 Mo.	0.6
Jun		0.0	Dec	>1 Mo.	0.7

Crop:	Corn, grain; Deming		Total Irrigation Needed:	32.6 ac in/ac	
Month	**Est. Frequency** *(days between Irr.)*	**In/Mo**	**Month**	**Est. Frequency** *(days between Irr.)*	**In/Mo**
Jan		0.0	Jul	9	8.4
Feb		0.0	Aug	10	7.5
Mar		0.0	Sep	14	5.3
Apr	>1 Mo.	0.5	Oct	>1 Mo.	1.0
May	22	3.5	Nov		0.0
Jun	12	6.5	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:	**Sprinkler, handline or wheelline**	System Efficiency (%):	**80%**
System Capacity (Ditch/Pump/Well):	**1000**	GPM	

Crop Grown	Days of Operation for CU by crop (days)	Est. System Applicaiton Rate (in/day)	Needed Application Rate (in/day)	System Evaluation
Wheat, winter, grain; Carlsbad	12	1.07	0.18	**System meets CU for crop**
Corn, grain; Deming	31	1.07	0.28	**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:** _____

Conservationist: _____ **Date:** _____

Completed by: _____ **Date:** _____

Conservation Crop Rotation

Conservation Practice Job Sheet 328

Natural Resources Conservation Service (NRCS) May, 2002

Specification Sheet

Client: CottonWood Springs Da **Tract:** 763, 770, 839 **Farm No.:** 751, 389

See attached drawing or photo location of the fields. **Date:** 11/20/2009 **Planned Application Date:** 11/20/2009

Definition:

Growing crops in a recurring sequence on the same field.

Purposes: Place a ☑ for the purpose(s). Check all that apply. If purpose is check see required application below.

- ☐ Maintain or improve soil organic matter
- ☐ Reduce Water Erosion
- ☑ Manage Plant Nutrients
- ☐ Provide food and cover for wildlife
- ☐ Reduce Wind Erosion
- ☐ Manage Plant Pests
- ☐ Manage crops for saline soils
- ☐ Provide food for domestic livestock
- ☐ Select crops to meet limited water

Crop Rotation: *Type the rotation for these fields (for example: Corn, grain-W-Wheat-Alfalfa 4yr)*

Crop Sequence: F1,F5,F6b: Alfalfa/Oats; F3:Bermuda; F4:Corn/WinterWheat

Field Information: *Type the year of the rotation and the crop grown that year for each field.*

		Year of the Rotation (2002, 2003 etc.)								
Field #	Acres	2009	2010	2011	2012	2013				
1	18	Alfalfa	Alfalfa	Alfaalfa/Oats	Alfalfa	Alfalfa				
3	30	Bermuda	Bermuda	Bermuda	Bermuda	Bermuda				
4	120	Corn/WW	Corn/WW	Corn/WW	Corn/WW	Corn/WW				
5	85	Oats	WW/Alfalfa	Alfalfa	Alfalfa	Alfalfa				
2	52	Pasture/WW	Pasture/WW	Pasture/WW	Pasture/WW	Pasture/WW				
6	40	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa				
7	40	Corn	Corn	Corn/WW	Corn/WW	Corn/WW				

Maintain or Improve Soil Organic Matter: *Attach the Soil Condition Index worksheet run.*

Soil Condition Index Score:	**0.37**	The above crop rotation produces enough biomass to improve or maintain good soil tilth. Tillage and soil erosion are in correct balance to the type of crops grown. The larger the number the better the rotation for building organic matter in the soil.

Wind Erosion: *See the Residue Management Jobsheet(s) or the Cover Crop Jobsheet for details.*

Wind erosion is not a primary purpose of this practice.

Wate osion: *See the Residue Management Jobsheet(s) for deta*

Water erosion control is not a primary purpose of this practice.

Crop(s) Selected Meet the Needs of Limited Irrigation Water: *See the NM-CONS-213 A or B form and the Irrigation Water Management Jobsheet for details.*

There is adaquate water to meet the Consumptive Use for this rotation and management of limited water is not a primary part of this practice.

Manage Plant Pests: *See the Pest Management Jobsheet for details.*

Crops were not selected to manage pests in the rotation.

Manage Plant Nutrients: *See the Nutrient Management Jobsheet for details.*

Crops were selected to add or remove nitrogen from the cropping system, or remove posphorus from the cropping system.

The green manure crop selected to add nitrogen to the system is:

The crop selected to remove nitrogen from the system is:

The crop selected to remove phosphorus from the system is:

Manage Crops for Saline Soils: *See the Irrigation Guide, Water Quality in the references portion of Sec I of the FOTG for the salt tolerant crop list.*

Crops were not primarily selected based on their salt tolerance in the rotation.

Soil Salinity (mmhos/cm or dS/m):

The crops that meet the 10% yield reduction for salinity are:

Provide Food and Cover for Wildlife: *See a Wildlife Habitat Jobsheet for details.*

Crops were not primarily selected based the need for food and cover for wildlife.

The featured animal(s) is:

The before WHEG score is: After applying the crop rotation the WHEG score is:

The following crop(s) provide the food and cover needed in the rotation:

Provide Food for Domestic Livestock: *See the Livestock, Forage, and Feed Worksheet, and the Prescribed Grazing Schedule Jobsheet for details.*

Crops were not selected based on food for domestic Livestock.

The crops that will be grazed are: **None**

Oper n and Maintenance Requirements

1. If the weather or economics causes a need to change the crop rotation, an acceptable substitute crops must be selected. Acceptable substitutes are crop(s) having similar properties that meet the identified resource concern(s).
2. Summer fallow can be used when needed on dryland fields or area where irrigation water is short, if erosion conserns are addressed

Management Tips

1. Till only necessary for good seedbed prepration and weed control.
2. Deep rooted crops such as alfalfa, utilize nutrients and water not available to shallow rooted.
3. Use the best adapted varieties when selecting crops. Check with the county extension office.
4. Chemically control pests only when theshold levels are reached.
5. Longer rotation lower the possiblity of resistance to a chemical control of pests.
6. Follow a crop with one that is not an alternate host to a specific pest to reduce to the overall pest problem.
7. High residue producing crops such as corn, and small grains tend to maintain tilth and oganic matter. Row crops such as onions and chile tend to lower tilth and organic matter.
8. Follow a legume crop with a crop that can use the added N. Select one that uses less N the third year.
9. Rotation that maintain a high orgainic matter level are more able to hold and breakdown pesticde residue.

Additional Requirements:

Job Approval and Completion

I agree to install this practice as designed and planned.

Client: _____ **Date:** _____

This practice is designed and planned according to NRCS NM Standards and Specifications:

Conservationist: _____ **Date:** _____

This practice was installed and maintained in accordance with this jobsheet.

Completed by: **Date:**

590 JOBSHEETS
(With Summary Sheets)

Cottonwood Springs Dairy NMP
590 Jobsheet Supplemental

Lagoon TKN Average Summary and Calculations

	Lagoon Sample Date	TKN Value (in mg/L)	Average 2008-2009 Sample Years (in mg/L)
2006	3/30/2006 8/9/2006	230 180	
2007	2/23/2007 7/24/2007	140 180	
2008	2/1/2008	350	**308**
2009	1/28/2009 5/12/2009 7/15/2009	420 260 200	

mg/L: milligrams per liter

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Aug-06*

CLIENT:	Glorieta GeoScience	**Client Sample ID:**	Lagoon
Lab Order:	0608149	**Collection Date:**	8/9/2006 4:30:00 PM
Project:	Cottonwood Springs Dairy	**Date Received:**	8/11/2006
Lab ID:	0608149-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: TES
Chloride	230	1.0		mg/L	10	8/23/2006 10:58:02 PM
Nitrate (As N)+Nitrite (As N)	ND	0.50		mg/L	5	8/13/2006 5:50:01 AM
EPA METHOD 160.1: TDS						Analyst: KS
Total Dissolved Solids	2100	40		mg/L	1	8/15/2006
EPA METHOD 351.3: TKN						Analyst: KS
Nitrogen, Kjeldahl, Total	180	5.0		mg/L	1	8/22/2006

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

Date: *06-Mar-07*

CLIENT:	Glorieta GeoScience	**Client Sample ID:**	Lagoon
Lab Order:	0702304	**Collection Date:**	2/23/2007 3:55:00 PM
Project:	Cottonwood Springs Dairy	**Date Received:**	2/26/2007
Lab ID:	0702304-03	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: TES
Chloride	270	1.0		mg/L	10	3/2/2007 4:17:06 PM
Nitrate (As N)+Nitrite (As N)	ND	1.0		mg/L	10	3/1/2007 8:00:45 PM
EPA METHOD 160.1: TDS						Analyst: KS
Total Dissolved Solids	2500	40		mg/L	1	2/28/2007
EPA METHOD 351.3: TKN						Analyst: MAP
Nitrogen, Kjeldahl, Total	140	10		mg/L	1	3/6/2007

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *02-Aug-07*

CLIENT:	Glorieta GeoScience	**Client Sample ID:**	Lagoon
Lab Order:	0707316	**Collection Date:**	7/24/2007 1:29:00 PM
Project:	Cottonwood Springs Dairy	**Date Received:**	7/25/2007
Lab ID:	0707316-05	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: KS
Chloride	220	2.0		mg/L	20	7/26/2007 12:42:22 PM
Nitrogen, Nitrate (As N)	ND	2.0		mg/L	20	7/26/2007 12:42:22 PM
EPA METHOD 160.1: TDS						Analyst: TAF
Total Dissolved Solids	2000	400		mg/L	1	7/27/2007
EPA METHOD 351.3: TKN						Analyst: SLB
Nitrogen, Kjeldahl, Total	180	10		mg/L	1	8/1/2007

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *12-Feb-08*

CLIENT:	Glorieta GeoScience	**Client Sample ID:**	Lagoon
Lab Order:	0802041	**Collection Date:**	2/1/2008 1:58:00 PM
Project:	Cottonwood Springs Dairy	**Date Received:**	2/4/2008
Lab ID:	0802041-03	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SLB
Chloride	250	2.0		mg/L	20	2/5/2008 5:14:31 PM
Nitrate (As N)+Nitrite (As N)	ND	4.0		mg/L	20	2/5/2008 6:06:44 PM
SM 2540C: TDS						Analyst: TAF
Total Dissolved Solids	4100	400		mg/L	1	2/6/2008
SM4500-NORG C: TKN						Analyst: TAF
Nitrogen, Kjeldahl, Total	350	10		mg/L	1	2/8/2008

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *10-Feb-09*

CLIENT:	Glorieta GeoScience	**Client Sample ID:**	Lagoon
Lab Order:	0901418	**Collection Date:**	1/28/2009 8:50:00 AM
Project:	Cottonwood Springs	**Date Received:**	1/29/2009
Lab ID:	0901418-02	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: RAGS
Chloride	230	1.0		mg/L	10	1/29/2009 5:33:07 PM
Nitrogen, Nitrate (As N)	ND	1.0		mg/L	10	1/29/2009 5:33:07 PM
SM 2540 C: TOTAL DISSOLVED SOLIDS						Analyst: KMS
Total Dissolved Solids	4800	2000		mg/L	1	1/29/2009
SM 4500 NORG C: TKN						Analyst: TAF
Nitrogen, Kjeldahl, Total	430	10		mg/L	1	2/1/2009

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	E	Estimated value	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
	ND	Not Detected at the Reporting Limit	RL	Reporting Limit
	S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *27-May-09*

CLIENT:	Glorieta GeoScience	**Client Sample ID:**	Lagoon
Lab Order:	0905266	**Collection Date:**	5/12/2009 4:02:00 PM
Project:	Cottonwood Springs Dairy	**Date Received:**	5/14/2009
Lab ID:	0905266-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: RAGS
Chloride	280	1.0		mg/L	10	5/21/2009 5:00:20 AM
Nitrate (As N)+Nitrite (As N)	ND	2.0		mg/L	10	5/20/2009 12:34:20 AM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: KMS
Total Dissolved Solids	3100	400		mg/L	1	5/15/2009
SM 4500 NORG C: TKN						Analyst: KMS
Nitrogen, Kjeldahl, Total	260	20		mg/L	1	5/19/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *22-Jul-09*

CLIENT:	Glorieta GeoScience	**Client Sample ID:**	Lagoon
Lab Order:	0907256	**Collection Date:**	7/13/2009 3:34:00 PM
Project:	Cottonwood Springs Dairy	**Date Received:**	7/15/2009
Lab ID:	0907256-04	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: RAGS
Chloride	260	2.0		mg/L	20	7/15/2009 2:49:10 PM
Nitrogen, Nitrate (As N)	ND	2.0		mg/L	20	7/15/2009 2:49:10 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: MMS
Total Dissolved Solids	2400	400		mg/L	1	7/17/2009
SM 4500 NORG C: TKN						Analyst: LJB
Nitrogen, Kjeldahl, Total	200	20		mg/L	1	7/21/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory

Date: *07-Apr-06*

CLIENT:	Glorieta GeoScience	**Client Sample ID:**	Lagoon
Lab Order:	0603365	**Collection Date:**	3/31/2006 12:30:00 PM
Project:	Cottonwood Springs Dairy	**Date Received:**	3/31/2006
Lab ID:	0603365-04	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: MAP
Chloride	290	2.0		mg/L	20	4/4/2006 1:49:01 AM
Nitrogen, Nitrate (As N)	ND	0.50		mg/L	5	4/1/2006 1:18:54 AM
EPA METHOD 160.1: TDS						Analyst: ks
Total Dissolved Solids	3000	250		mg/L	1	4/5/2006
EPA METHOD 351.3: TKN						Analyst: TES
Nitrogen, Kjeldahl, Total	230	5.0		mg/L	1	4/4/2006

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit

WARD Laboratories, Inc.

Ag Testing - Consulting

Account No. : 56204

Manure Analysis Report

GLORIETA GEOSCIENCE INC
PO BOX 5727
SANTA FE NM 87502-5727

Invoice No. : 1010195
Date Received : 12/26/2006
Date Reported : 12/27/2006

Lab No. : 1317

Results For : COTTONWOOD SPRINGS DAIRY
Sample ID : 11-20-06
SEPERATOR

	Analysis Dry Basis	Lbs / Ton Dry Basis	Lbs / Ton As Is Basis	Lbs / Ton Available First Year As Is Basis
Organic N, % N	1.19	23.9	4.4	1.1
Ammonium, % N	0.03	0.6	0.1	0.1
Nitrate, % N	< 0.01	0.0	0.0	0.0
Total N (TKN), % N	1.23	24.5	4.5	1.2
Phosphorus, % P_2O_5	0.69	13.8	2.5	1.8
Potassium, % K_2O	0.33	6.7	1.2	1.1
Sulfur, % S	0.30	5.9	1.1	0.4
Calcium, % Ca	1.26	25.1	4.6	3.2
Magnesium, % Mg	0.22	4.4	0.8	0.6
Sodium, % Na	0.16	3.2	0.6	0.6
Zinc, ppm Zn	167.9	0.3	0.1	0.0
Iron, ppm Fe	1362.2	2.7	0.5	0.4
Manganese, ppm Mn	47.6	0.1	0.0	0.0
Copper, ppm Cu	18.3	0.0	0.0	0.0
Soluble Salts, mmho / cm	5.39	6.9	1.3	1.3
pH	7.8			
Moisture, %	81.65			
Dry Matter, %	18.35			

"<" - Not Detected / Below Detection Limit

Reviewed By : Raymond Ward 12/29/2006 Copy : 1

Bus: 308-234-2418
Fax: 308-234-1940

web site
www.wardlab.com

4007 Cherry Ave., P.O. Box 788
Kearney, Nebraska 68848-0788

WARD Laboratories, Inc.

Soil Test Report

received

WARD LABORATORIES, INC.
P.O. Box 788 • 4007 Cherry Avenue
Kearney, Nebraska 68848-0788
(308) 236-2275

Customer: P TROOST
Farm: FIELD 4

Sent To: 56199
FRENCH, CARROLL (CEC)
CEC (AG) LLC
1007 W SEARS AVE
ARTESIA NM 88210

Invoice No.: 724007
Date Received: January 9 2003
Date Reported: January 13 2003
Lab Sample No's: 3738 thru 3739

MAIL

Soil Test Results

Sample ID	1:1 Soil pH	WDRF Buffer pH	S Calc 1:1 mmho/cm	Excess Lime Rating	Organic Matter LOI-%	Nitrate-N (FIA) KCl Inches	Nitrate-N (FIA) KCl ppm N	Nitrate-N (FIA) KCl lbsN/A	Phosphorus ppm P	Potassium NH4OAc ppm K	Sulfate Ca P ppm S	Zinc DTPA ppm Zn	Iron DTPA ppm Fe	Manganese DTPA ppm Mn	Copper DTPA ppm Cu	Calcium NH4OAc ppm Ca	Magnesium NH4OAc ppm Mg	Sodium NH4OAc ppm Na	Boron Hot Water ppm B
757						0-8	18.3	44											
758						24-36	40.3	145											

Fertilizer Recommendations in Actual Pounds of Plant Nutrient per Acre

Sample ID	Crop	Yield Goal	Nitrogen N	Phosphorus P_2O_5	Potassium K_2O	Sulfur S	Zinc Zn	Magnesium Mg	Iron Fe	Manganese Mn	Copper Cu	Boron B	Lime, ECC Ton/A	Source of Calcium lbs/100g	% Saturation H	K	Ca	Mg	Na

Sample ID	TKN ppm N
757	1796
758	373

Reviewed By: Raymond Ward

SOIL ANALYSIS REPORT

CLIENT: 1290	AGRILIANCE 103 E MILL RD P O BOX 38 ARTESIA, NM 88210-0038

Servi-Tech Laboratories
1515 E. Wyatt Earp, PO Box 1357
Dodge City, KS 67801
Phone 620-227-7123
FAX 620-227-2047

LAB NO:	17942-17945
INVOICE NO:	D41926
DATE RECEIVED:	12-21-04
DATE REPORTED:	12-30-04

FIELD IDENTIFICATION: CWS

SOIL ANALYSIS RESULTS FOR: CWS

METHODS USED:			1:1	SMP	1:1		Bray	OS Reduction		Olsen	Ammonium Acetate						DTPA			
Lab Number	Sample ID	Sample Depth	Soil pH	Buffer pH	Sat. Soluble Salts mmhos/cm	Excess Lime	% Organic Matter	Nitrate-Nitrogen ppm	Nitrate-Nitrogen lb. N/A	Phosphorus ppm P	Potassium ppm K	Sulfur ppm	Sulfur lb. S/A	Calcium ppm Ca	Magnesium ppm Mg	Sodium ppm Na	Zinc ppm Zn	Iron ppm Fe	Manganese ppm Mn	Copper ppm Cu
17942	1	0- 6	7.9		0.56	Hi	2.9	16	29	113	763	126	227	5531	461	22	5.7	22.4	7.8	62.2
17943	4	0- 6	8.1		0.49	Hi	2.8	8	14	120	521	75	135	5349	465	35	9.4	8.4	6.5	3.1
17944	5	0- 6	8.1		0.56	Hi	4.5	14	25	495	1158	46	83	4778	642	67	9.9	11.8	10.3	6.4
17945	7	0- 6	8.1		0.51	Hi	1.6	12	22	56	307	48	86	5313	444	51	23.5	6.8	7.8	3.0

FERTILIZER RECOMMENDATIONS: POUNDS ACTUAL NUTRIENT PER ACRE

Lab Number	Sample ID	Crop to Be Grown	Yield Goal	Lime, ECC Tons/A	Nitrogen N	Phosphorus P_2O_5	Potassium K_2O	Zinc Zn	Sulfur S	MgO	Cu	Mn
17942	1	ALFALFA - NEW	9 T		10	0	0	0	0	0	0	0
17943	4	WHEAT HAY	2 T		45	0	0	0	0	0	0	0
17944	5	ALFALFA - NEW	9 T		10		0	0	0	0	0	0
17945	7	CORN SILAGE	28 T		260	0	0	0	0	0	0	0

CATION EXCHANGE CAPACITY

CEC	%H	%K	%Ca	%Mg	%Na
34	0	6	82	11	0
32	0	4	83	12	0
33	0	9	74	16	1
31	0	3	84	12	1

SPECIAL COMMENTS AND SUGGESTIONS:

SAMPLE(S): 1, 4, 5, 7
CEC calculated by cation summation may overestimate true CEC and underestimate exchangeable sodium percentage (ESP) in soils containing excess lime.

SAMPLE(S): 1, 5
FORAGE LEGUMES (alfalfa or clover), NEW SEEDING: Applying 15 to 20 lbs of nitrogen can aid in establishing legumes, if soil nitrate is low. Do not apply excess nitrogen or it may stimulate competition from grassy weeds.

SAMPLE(S): 4, 7
Subsoil nitrate samples to 24 or 36 inches can improve the accuracy of nitrogen recommendations. Contact the laboratory for further details.

Analyses are representative of the samples submitted. • Samples are retained 30 days after report of analysis. • Explanation of soil analysis terms is on the back of the yellow copy.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

COVER LETTER

Wednesday, July 28, 2010

Phil Goetze
Glorieta GeoScience
P.O. Box 5727
Santa Fe, NM 87502

TEL: (505) 983-5546
FAX (505) 983-6482

RE: Cottonwood Springs Dairy

Order No.: 1007923

Dear Phil Goetze:

Hall Environmental Analysis Laboratory, Inc. received 1 sample(s) on 7/27/2010 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites.

Reporting limits are determined by EPA methodology.

Please do not hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Laboratory Manager

NM Lab # NM9425 NM0901
AZ license # AZ0682
ORELAP Lab # NM100001
Texas Lab# T104704424-08-TX

Hall Environmental Analysis Laboratory, Inc.

Date: *28-Jul-10*

CLIENT:	Glorieta GeoScience	**Client Sample ID:**	Lagoon
Lab Order:	1007923	**Collection Date:**	7/26/2010 2:00:00 PM
Project:	Cottonwood Springs Dairy	**Date Received:**	7/27/2010
Lab ID:	1007923-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
						Analyst: LJB
EPA METHOD 300.0: ANIONS						
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	7/27/2010 12:59:40 PM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- NC Non-Chlorinated
- PQL Practical Quantitation Limit
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

ıient: Glorieta GeoScience
Project: Cottonwood Springs Dairy

Work Order: 1007923

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: **EPA Method 300.0: Anions**											
Sample ID: **MB**		*MBLK*				**Batch ID:**	**R40049**	**Analysis Date:**	**7/27/2010 11:15:14 AM**		
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50								
Sample ID: **LCS**		*LCS*				**Batch ID:**	**R40049**	**Analysis Date:**	**7/27/2010 11:32:38 AM**		
Phosphorus, Orthophosphate (As P)	4.780	mg/L	0.50	5	0	95.6	90	110			

Qualifiers:

E Estimated value
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
H Holding times for preparation or analysis exceeded
NC Non-Chlorinated
R RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name **GGI** Date Received: **7/27/2010**

Work Order Number **1007923** Received by: TLS

Sample ID labels checked by: _____ Initials

Checklist completed by: _____ Signature 7/27/10 Date

Matrix: Carrier name: UPS

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	N/A ☑	
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		Number of preserved bottles checked for pH:
Water - VOA vials have zero headspace? No VOA vials submitted	☑	Yes ☐	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☐	No ☐	N/A ☑	_____
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑	*<2 >12 unless noted below.*
Container/Temp Blank temperature?	**0.4°**	*<6° C Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Chain-of-Custody Record

Client: CCT

Mailing Address: PO Box 5727 Santa Fe

Phone #: 983-5446

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation:
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☐ Standard ☒ Rush ASAP

Project Name: Cottonwood Spring Ranch

Project #:

Project Manager: Phil Goetz

Sampler: Tracy

On Ice: ☒ Yes ☐ No

Sample Temperature: 0.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1007923	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO3,NO2,PO4,SO4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA) 1004				Air Bubbles (Y or N)
7-26-10	2:00	H2O	Lagoon	1500mL	—	-1											X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
7-26	3:00	[signature]	[signature]	7/27	1030
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: email Report /A 7/28/10

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cottonwood Springs Dairy NMP
590 Jobsheet Supplemental (with Amended Jobsheet Results)
Crop Selection for 2010 through 2014
590 Jobsheets Application Summary

Primary Crops for Field

Field No.	Field Acreage	Alfalfa			Corn			Oats			Winter Wheat			Pasture Grass (Long Season)			Bermuda Grass			Grazing-N Balance
		Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Nitrogen Removal (lbs./acre)
1	18 ac.	**488**	**10,262,700**	**36**	112	2,204,037	36	150	3,127,680	36	150	3,117,906	36	180	3,699,459	36	101	1,993,896	36	Not calculated
2	52 ac.	443	27,304,212	104	**74***	4,164,810	104	80	4,658,940	104	**150***	**8,993,166**	**104**	**180**	**10,729,680**	**104**	56	2,993,016	104	396.68
3	30+ ac.	490	17,194,095	60	112	3,648,960	60	150	5,212,800	60	150	5,188,365	60	180	6,157,620	36	**103**	**3,404,610**	**60**	232.06
4	120 ac.	506	70,991,820	240	**146**	**19,613,160**	**240**	225	31,602,600	240	**225**	**31,537,440**	**240**	220	30,299,400	240	119	15,866,460	240	234.75
5	85 ac.	**443**	**43,916,483**	**170**	82	7,338,645	170	**150**	**14,769,600**	**170**	150	14,700,368	170	180	17,308,125	170	57	4,892,430	170	242.07
6	36 ac.	**457**	**19,210,797**	**72**	68	2,511,918	72	150	6,255,360	72	150	6,226,038	72	180	7,330,500	72	71	2,687,850	72	Not calculated
7	40 ac.	534	25,032,300	80	**159**	**7,145,880**	**80**	150	6,950,400	80	150	6,917,820	80	180	8,036,400	80	147	6,646,320	80	244.95
Totals for Primary Crop Only			**73,389,980**	**278**		**26,759,040**	**320**		**14,769,600**	**170**		**40,530,606**	**344**		**10,729,680**	**104**		**3,404,610**	**60**	

Application Totals For Primary Crops (2010 Through 2014)		
	Applied Liquids (in gallons):	169,583,516
	Applied Solids (in tons):	1,276

***NOTE:** Soil nitrogen (N) in Field 2 was reduced to half to accommodate green water application for winter wheat, corn, and pasture grasses, anticipating a decrease in soil N since 2004.
lbs. per ac.: pounds per acre

Cottonwood Springs Dairy NMP
590 Jobsheet Supplemental (with Application of Runoff from Catchment Basin)
Crop Selection for 2010 through 2014
590 Jobsheets Application Summary

Primary Crops for Field [ ] Fields with Additional Nutrient Application from Catchment Basin Runoff [ ]

Field No.	Field Acreage	Alfalfa			Corn			Oats			Winter Wheat			Pasture Grass (Long Season)			Bermuda Grass			Grazing-N Balance
		Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Recommended Nitrogen Nutrient Rate (lbs. per ac.)	Maximum Green Water Application (gallons)	Manure Solids Applied (tons)	Nitrogen Removal (lbs./acre)
1	18 ac.	**488**	**10,262,700**	**36**	112	2,204,037	36	150	3,127,680	36	150	3,117,906	36	180	3,699,459	36	101	1,993,896	36	Not calculated
2	52 ac.	443	*26,894,790*	104	74*	*3,797,742*	104	80	*4,235,400*	104	**150***	***8,611,980***	**104**	**180**	***10,376,730***	**104**	56	*2,611,830*	104	396.68
3	30+ ac.	490	*16,966,035*	60	112	*3,420,900*	60	150	*4,976,595*	60	150	*4,968,450*	60	180	*5,945,850*	36	**103**	***3,176,550***	**60**	232.06
4	120 ac.	506	70,991,820	240	**146**	**19,613,160**	**240**	225	31,602,600	240	**225**	**31,537,440**	**240**	220	30,299,400	240	119	15,866,460	240	234.75
5	85 ac.	**443**	**43,916,483**	**170**	82	7,338,645	170	**150**	**14,769,600**	**170**	150	14,700,368	170	180	17,308,125	170	57	4,892,430	170	242.07
6	36 ac.	**457**	**19,210,797**	**72**	68	2,511,918	72	150	6,255,360	72	150	6,226,038	72	180	7,330,500	72	71	2,687,850	72	Not calculated
7	40 ac.	534	25,032,300	80	**159**	**7,145,880**	**80**	150	6,950,400	80	150	6,917,800	80	180	8,036,400	80	147	6,646,320	80	244.95
Totals for Primary Crop Only			**73,389,980**	**278**		**26,759,040**	**320**		**14,769,600**	**170**		**40,149,420**	**344**		**10,376,730**	**104**		**3,176,550**	**60**

Application Totals For Primary Crops (2010 Through 2014)		
	Applied Liquids (in gallons):	**168,621,320**
	Applied Solids (in tons):	**1,276**

***NOTE:** Soil nitrogen (N) in Field 2 was reduced to half to accommodate green water application for winter wheat, corn, and pasture grasses, anticipating a decrease in soil N since 2004.
lbs. per ac.: pounds per acre

Cottonwood Springs Dairy NMP
590 Jobsheet Supplemental

Manure Solids Summary and Calculations

Cow Type	Number of Animals	Average Wt per Animal (lbs/animal)	Manure Production* (lbs/day/1000lbs)	Manure Production (lbs/day)	Manure Solids Only (12% of manure*; lbs/day)	Manure Solids (lbs/yr)	Manure Solids (tons/year)	Total N (lbs)	Total P (in lbs)
Milking Cows	3,400	1400	80	380,800	45,696	16,679,040	8,340	205,152	115,085
Dry Cows	423	1200	82	41,623	4,995	1,823,096	912	22,424	12,579
Heifers	1,260	750	85	80,325	9,639	3,518,235	1,759	43,274	24,276
Others (calves)	1,905	350	85	56,674	6,801	2,482,310	1,241	30,532	17,128
Totals	6,988			**559,422**	**67,131**	**24,502,681**	**12,251**	**301,383**	**169,069**

Manure Analytical Results (12/26/2006)

Total N (in %): 1.23
Total P (in %): 0.69

*Sources: NRCS New Mexico Dairy planning Sheet Version 2.3 and NRCS AWMFH (April, 1992)

Cottonwood Springs Dairy NMP - Summary of 590 Jobsheet Nutrient Recommendations (in pounds per acre)

Field	Crop	Recommended Nutrient Rate (Nitrogen)	Total Source Application (Nitrogen)	Organic Nutrient Source (Nitrogen)	Irrigation Water Credit	Other Nutrient Sources	Comments
1	Pasture, Bermuda	101	101	95	6	NA	590 Jobsheet Included
	Pasture, Gs,Ls	180	180	175	5	NA	590 Jobsheet Amended
	Wheat silage	150	150	147	3	NA	
	Oats silage	150	150	147	3	NA	
	Corn silage	112	112	105	7	NA	
	Alfalfa	488	488	478	10	NA	
2	Pasture, Bermuda	56	56	50	6	NA	
	Pasture, Gs,Ls	180	180	175	5	NA	
	Wheat silage	150	150	147	3	NA	
	Oats silage	80	80	77	3	NA	
	Corn silage	74	74	69	5	NA	
	Alfalfa	443	443	440	3	NA	590 Jobsheet Amended
2 with Catchment Runoff	Pasture, Bermuda	56	55.72	44	6	5.72	New 590 Jobsheet
	Pasture, Gs,Ls	180	179.72	169	5	5.72	New 590 Jobsheet
	Wheat silage	150	149.72	141	3	5.72	New 590 Jobsheet
	Oats silage	80	78.72	70	3	5.72	New 590 Jobsheet
	Corn silage	74	73.72	63	5	5.72	New 590 Jobsheet
	Alfalfa	443	442.72	434	3	5.72	New 590 Jobsheet
3	Pasture, Bermuda	103	103	97	6	NA	590 Jobsheet Amended
	Pasture, Gs, Ls	180	180	174	6	NA	
	Wheat silage	150	150	147	3	NA	
	Oats silage	150	150	147	3	NA	
	Corn silage	112	111	104	7	NA	
	Alfalfa	490	490	480	10	NA	
3 with Catchment Runoff	Pasture, Bermuda	103	102.72	91	6	5.72	New 590 Jobsheet
	Pasture, Gs,Ls	180	179.72	168	6	5.72	New 590 Jobsheet
	Wheat silage	150	149.72	141	3	5.72	New 590 Jobsheet
	Oats silage	150	149.72	141	3	5.72	New 590 Jobsheet
	Corn silage	112	110.72	98	7	5.72	New 590 Jobsheet
	Alfalfa	490	489.72	474	10	5.72	New 590 Jobsheet
4	Pasture, Bermuda	119	119	113	6	NA	
	Pasture, Gs, Ls	220	219	213	6	NA	
	Wheat silage	225	225	222	3	NA	
	Oats silage	225	225	222	3	NA	
	Corn silage	146	146	139	7	NA	
	Alfalfa	506	506	496	10	NA	
5	Pasture, Bermuda	57	56	50	6	NA	
	Pasture, Gs, Ls	180	178	172	6	NA	
	Wheat silage	150	150	147	3	NA	
	Oats silage	150	150	147	3	NA	
	Corn silage	82	81	74	7	NA	
	Alfalfa	443	443	433	10	NA	
6	Pasture, Bermuda	71	71	65	6	NA	
	Pasture, Gs, Ls	180	178	172	6	NA	
	Wheat silage	150	150	147	3	NA	
	Oats silage	150	150	147	3	NA	
	Corn silage	68	68	61	7	NA	
	Alfalfa	457	457	447	10	NA	590 Jobsheet Amended
7	Pasture, Bermuda	147	147	141	6	NA	
	Pasture, Gs, Ls	180	176	170	6	NA	
	Wheat silage	150	150	147	3	NA	
	Oats silage	150	150	147	3	NA	
	Corn silage	159	158	151	7	NA	
	Alfalfa	534	534	524	10	NA	

NA: not applicable

Cottonwood Springs Dairy NMP
590 Jobsheet Supplemental
Primary Crops For Each Land Application Areas

Field No.	Field Acreage	Crop Year 2009	Crop Year 2010	Crop Year 2011	Crop Year 2012	Crop Year 2013	Crop Year 2014
1	18ac.	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
2	52 ac.	Pasture/Winter Wheat	Pasture/Winter Wheat	Pasture/Winter Wheat	Pasture/Winter Wheat	Pasture/Winter Wheat	Pasture/Winter Wheat
3	30+ ac.	Bermuda	Bermuda	Bermuda	Bermuda	Bermuda	Bermuda
4	120 ac.	Corn, silage/Winter Wheat	Corn, silage/Winter Wheat	Corn, silage/Winter Wheat	Corn, silage/Winter Wheat	Corn, silage/Winter Wheat	Corn, silage/Winter Wheat
5	85 ac.	Oats, silage	Oats, silage/Alfalfa	Alfalfa	Oats, silage/Alfalfa	Alfalfa	Alfalfa
6	36 ac.	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
7	40 ac.	Corn, silage	Corn, silage	Corn, silage	Corn, silage	Corn, silage	Corn, silage

Cottonwood Springs Dairy

Summary of Nitrogen Generated from Storm Water Runoff onto Fields 2 and 3

Runoff from corral calf pen area drains into Catchment Basin en route Field 2 and Field 3

Field	Acres
Field 2	52
Field 3	30
Total Acreage	82

Item					Comments
Volume of Runoff draining into Catchment Basin en route 28.8 ac corral calf pen area	7	ac-ft	2,280,957	gallons	
Average lagoon TKN at Cottonwood Springs Dairy	246	mg/l	0.0021	lbs N /gal	Stormwater runoff may not have a TKN concentration as high as lagoon TKN, however to be more conservative lagoon TKN is being used in the calculations
Total amount of N generated from 7 ac-ft runoff			4687	lbs	
Scenarios/Assumptions					
Amount of N generated if 100 % of the 7 ac-ft runoff is retained in Field 2 and Field 3 (82 acres)			57.2	lbs/ac	Runoff water may be absorbed only till the soils gets saturated, so chances that 100% of the runoff will be retained in Field 2 and Field 3 are very low
Amount of N generated if 10% of the 7 ac-ft runoff is retained in Field 2 and Field 3 before the soils are saturated			5.7	lbs/ac	1. Chances that 10% of the runoff is absorbed by Field 2 and Field 3 are very less since if it rains, it rains on the Field 2 and Field 3 too and soils get mostly saturated by the time runoff water from corral calfpens makes its way to Field 2 and Field 3. 2. Chances that there will be a 25 year 24 hour rainfall event is 1 out of every 25 years, however to be conservative calculations were performed taking worst case scenario that there may be a 25 year 24 hour rainfall event every year.

U.S. Department of Agriculture
Natural Resources Conservation Service

NM-ENG-121 (modified for dairy runoff ponds)
Version 2.6 (5/8/06)

HYDROLOGY DATA SHEET for 25 yr 24 hr rainfall in NM

(Chapter 2 - Engineering Field Manual for Conservation Practices, NM 2/85 update, modified for volume only)

Planners are reminded that ALL clean water from the runoff area is to be DIVERTED out of the pond drainage area.

Dairy Name: Cottonwood Springs Da
Dairy Manager: Mr Philip Troost
Pond Name/Num.: Runoff Pond SW
Planner: Reddy Ganta
Pond Location (Climate by County): Eddy, ARTESIA 6 S NM0600

Location: Artesia
Practice Name: 378 Pond
DATE: 11/30/09
CHECKED BY: PG

Weighted Average Runoff Curve Number

Acres in WS	Soil Map Unit #	Soil Name	Soil Hydrologic Condition & Hyd. Soil Group	RCN[1]	RCN x Ac
28.8	All	All	Feedlot-Confined Animal Area, unpaved - All	90	2592
	All	All	Impervious Areas-pavement, roofs, concrete alleys - All	95	0
	All	All	Feedlot-Confined Animal Area, unpaved - All	90	0

TOTAL DRAINAGE AREA (A) = 28.8 ac

WEIGHTED RUNOFF CURVE NUMBER = 90

CHANNEL-LOSS FACTOR (CLF):	1 (For dairies it is always 1)
RAINFALL, 24-HR:	4.0 in
DIRECT RUNOFF (Q):	2.9 in
NET RUNOFF (Q*CLF):	2.9 in
VOLUME OF RUNOFF (Qn*A/12):	**7.0 ac-ft**

[1] RCNs are based on the Chapter 2 of the Engineering Field Manual (updated for NM 2/85) and the TR-55 manual (6/86). Selected numbers are appropriate for NM dairy runoff pond estimates.

Briefly describe the dairy pond drainage hydrologic condition:

NM-POND SIZE EVALUATION OR LOT RUNOFF

USDA Natural Resources Conservation Service Version 2.6 (5/8/06) **Date:** 11/30/2009

Dairy Name:	Cottonwood Springs D	**Dairy Manager:**	Mr Philip Troost
Location:	Artesia	**Planner:**	Reddy Ganta
Pond/Lagoon #:	Runoff Catchment	**Pond Type:**	Runoff Pond (feeding area)

Pond Storage Capacity

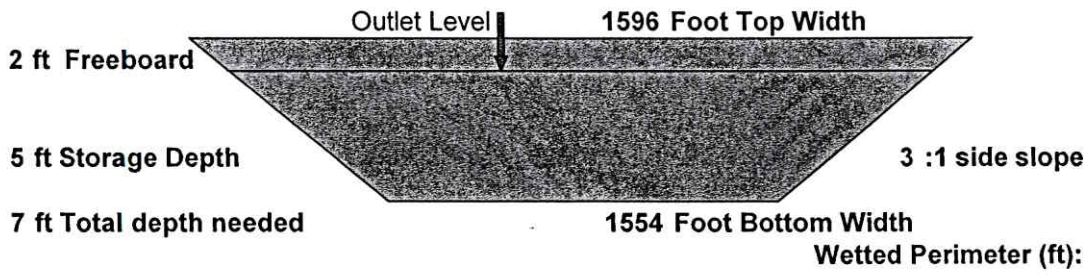
25 year-24 hrs Storm Runoff Volume Storage Requirement:	**23.1 ac. ft.**
25 year-24 hrs Storm Direct Rainfall Volume Storage Requirement:	**19.5 ac. ft.**
Total Design Volume Needed:	**42.6 ac. ft.**

POND DEPTH (high water line) (ft)	5	
FREEBOARD (above high water line) (ft)	2	
LENGTH (high water line) (ft)	1584	Pond size is OK.
WIDTH (high water line) (ft)	1584	
SIDE SLOPE (inside) (ft:ft)	3 :1	
SURFACE AREA (high water Line)	57.6	Acres

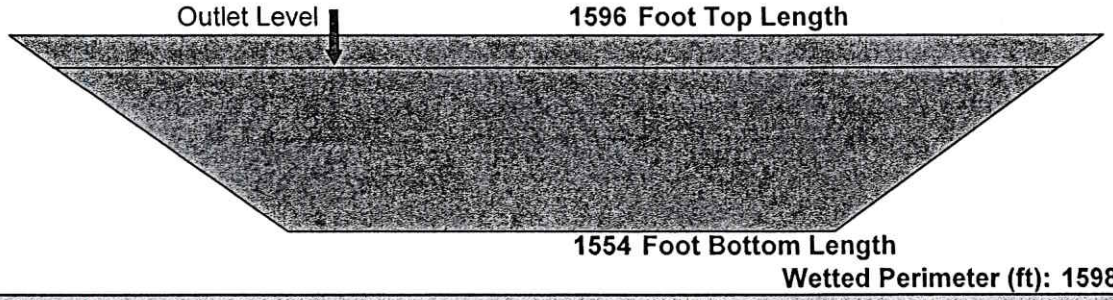
Total Designed Storage:	**282.6 ac. ft.**	**456084 cu. Yd.**
	3391.0 ac. in.	**######### gal.**

Note: ***((area of high water line)+(area of the bottom)+(4 times the area of the mid section))*(depth)/6 = Vol (cu ft)***

Width cross section (not to scale)



Length cross section (not to scale)



Construction Quantities

Bottom Area =	**2414916 sq. ft.**	
Top Area =	**2547216 sq. ft.**	
Excavation Volume =	**643163 Cu. Yds.**	
Lining Area =	**2,592,976 ft^2**	**288108 yds^2**

Note: These quantities assumes a level existing ground surface.