APPLICATION FOR SUBSTANTIAL CHANGE TO THE EPA FOR NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT AUTHORIZATION FOR DISCHARGES FROM CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFOs)

Prepared for:
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South
NPDES Permit #NMG10032
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Clovis, NM 88101

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Oppliger Feedyard (South)
Curry County, New Mexico

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SECTION 1 NOTICE OF INTENT

Form Approved
OMB No. 2040-0250

COPY

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
NMG010032

FORM 2B NPDES	EPA	U.S. ENVIRONMENTAL PROTECTION AGENCY APPLICATIONS FOR PERMIT TO DISCHARGE WASTEWATER CONCENTRATED ANIMAL FEEDING OPERATIONS AND AQUATIC ANIMAL PRODUCTION FACILITIES

I. GENERAL INFORMATION

Applying for: Individual Permit ☐ Coverage Under General Permit ☒

A. TYPE OF BUSINESS	B. CONTACT INFORMATION	C. FACILITY OPERATION STATUS
☒ 1. Concentrated Animal Feeding Operation (complete items B, C, D, and Section II) ☐ 2. Concentrated Aquatic Animal Production Facility (complete items B, C, and section III)	Owner/or Operator Name: Oppliger Feedyard Inc. Telephone: (575) 389-5321 Address: PO Box 854 Facsimile: (575) 389-5324 City: Clovis State: NM Zip Code: 88101	☒ 1. Existing Facility ☐ 2. Proposed Facility

D. FACILITY INFORMATION

Name: Oppliger Feedyard South Telephone: (575) 389-5321
Address: PO Box 854 Facsimile: (575) 389-5324
City: Clovis State: NM Zip Code: 88101
County: Curry Latitude: 34.3522 Longitude: -103.0456

If contract operation: Name of Integrator: _____
Address of Integrator: _____

II. CONCENTRATED ANIMAL FEEDING OPERATION CHARACTERISTICS

A. TYPE AND NUMBER OF ANIMALS

1. TYPE	2. ANIMALS: NO. IN OPEN CONFINEMENT	2. ANIMALS: NO. HOUSED UNDER ROOF
☐ Mature Dairy Cows		
☐ Dairy Heifers		
☐ Veal Calves		
☒ Cattle (not dairy or veal)	18,000	
☐ Swine (55 lbs. or over)		
☐ Swine (under 55 lbs.)		
☐ Horses		
☐ Sheep or Lambs		
☐ Turkeys		

B. Manure, Litter and/or Wastewater Production and Use

1) How much manure, litter and wastewater is generated annually by the facility? 16747 tons 10.4 Mill gallons

2) If land applied how many acres of land under the control of the applicant are available for applying the CAFOs manure/litter/wastewater? 613 acres

3) How many tons of manure or litter, or gallons of wastewater produced by the CAFO will be transferred annually to other persons? tons/gallons (*circle one*) 16747 tons

☐ Chickens (Broilers)		
☐ Chickens (Layers)		
☐ Ducks		
☐ Other Specify _____		
3. TOTAL ANIMALS	18,000	

C. ☒ TOPOGRAPHIC MAP

D. TYPE OF CONTAINMENT, STORAGE AND CAPACITY

1. Type of Containment	Total Capacity (in gallons)
☐ Lagoon	
☒ Holding Pond	10,557,572
☐ Evaporation Pond	
☐ Other: Specify _____	

2. Report the total number of acres contributing drainage: 94 acres

3. Type of Storage	Total Number of Days	Total Capacity (gallons/tons)
☐ Anaerobic Lagoon		
☒ Storage Lagoon	30	10,557,572 gals
☐ Evaporation Pond		
☐ Aboveground Storage Tanks		
☐ Belowground Storage Tanks		
☐ Roofed Storage Shed		
☐ Concrete Pad		
☐ Impervious Soil Pad		
☐ Other: Specify _____		

E. NUTRIENT MANAGEMENT PLAN

Note: Effective February 27, 2009, a permit application is not complete until a nutrient management plan is submitted to the Permitting Authority.

1. Please indicate whether a nutrient management plan has been included with this permit application. ☒ Yes ☐ No

2. If no, please explain:

3. Is a nutrient management plan being implemented for the facility? ☒ Yes ☐ No

4. The date of the last review or revision of the nutrient management plan. Date: _____

5. If not land applying, describe alternative use(s) of manure, litter, and or wastewater:

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F. LAND APPLICATION BEST MANAGEMENT PRACTICES
Please check any of the following best management practices that are being implemented at the facility to control runoff and protect water quality:

☐ Buffers ☐ Setbacks ☑ Conservation tillage ☐ Constructed wetlands ☐ Infiltration field ☐ Grass filter ☐ Terrace

III. CONCENTRATED AQUATIC ANIMAL PRODUCTION FACILITY CHARACTERISTICS

A. For each outfall give the maximum daily flow, maximum 30-day flow, and the long-term average flow.

1. Outfall No.	2. Flow (*gallons per day*)		
	a. Maximum Daily	b. Maximum 30 Day	c. Long Term Average

B. Indicate the total number of ponds, raceways, and similar structures in your facility.

1. Ponds	2. Raceways	3. Other

C. Provide the name of the receiving water and the source of water used by your facility.

1. Receiving Water	2. Water Source

D. List the species of fish or aquatic animals held and fed at your facility. For each species, give the total weight produced by your facility per year in pounds of harvestable weight, and also give the maximum weight present at any one time.

1. Cold Water Species			2. Warm Water Species		
a. Species	b. Harvestable Weight (*pounds*)		a. Species	b. Harvestable Weight (*pounds*)	
	(1) Total Yearly	(2) Maximum		(1) Total Yearly	(2) Maximum

E. Report the total pounds of food during the calendar month of maximum feeding.

1. Month	2. Pounds of Food

IV. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. Name and Official Title (*print or type*)	B. Phone No. ( )
Don Oppliger owner	575-389-5321
C. Signature	D. Date Signed
	12/2/09

INSTRUCTIONS

GENERAL

This form must be completed by all applicants who check "yes" to Item II-B in Form 1. Not all animal feeding operations or fish farms are required to obtain NPDES permits. Exclusions are based on size. See the description of these statutory and regulatory exclusions in the General Instructions that accompany Form 1.

For aquatic animal production facilities, the size cutoffs are based on whether the species are warm water or cold water, on the production weight per year in harvestable pounds, and on the amount of feeding in pounds of food (*for cold water species*). Also, facilities which discharge less than 30 days per year, or only during periods of excess runoff (*for warm water fish*) are not required to have a permit.

Refer to the Form 1 instructions to determine where to file this form.

Item I-A

See the note above and the General Instructions which accompany Form 1 to be sure that your facility is a "concentrated animal feeding operation" (CAFO).

Item I-B

Use this space to give owner/operator contact information.

Item I-C

Check "proposed" if your facility is not now in operation or is expanding to meet the definition of a CAFO in accordance with the information found in the General Instructions that accompany Form 1.

Item I-D

Use this space to give a complete legal description of your facility's location including name, address, and latitude/longitude. Also, the if a contract grower, the name and address of the integrator.

Item II

Supply all information in item II if you checked (1) in item I-A.

Item II-A

Give the maximum number of each type of animal in open confinement or housed under roof (either partially or totally) which are held at your facility for a total of 45 days or more in any 12 month period. Provide the total number of animals confined at the facility.

Item II-B

Provide the total amount of manure, litter and wastewater generated annually by the facility. Identify if manure, litter and wastewater generated by the facility is to be land applied and the number of acres, under the control of the CAFO operator, suitable for land application. If the answer to question 3 is yes, provide the estimated annual quantity of manure, litter and wastewater that the applicant plans to transfer off-site.

Item II-C

Check this box if you have submitted a topographic map of the geographic area in which the CAFO is located showing the specific location of the production area.

Item II-D

1. Provide information on the type of containment and the capacity of the containment structure (s).
2. The number of acres that are drained and collected in the containment structure (s).
3. Identify the type of storage for the manure, litter and/or wastewater. Give the capacity of this storage in days and gallons or tons.

Item II-E

Provide information concerning the status of submitting a nutrient management plan for the facility to complete the application. In those cases where the nutrient management plan has not been submitted, provide an explanation. If not land applying, describe the alternative uses of the manure, litter, and wastewater (*e.g.*, composting, pelletizing, energy generation, etc.).

Item II-F

Check any of the identified conservation practices that are being implemented at the facility to control runoff and protect water quality.

Item III

Supply all information in Item III if you checked (2) in Item I-A.

Item III-A

Outfalls should be numbered to correspond with the map submitted in Item XI of Form 1. Values given for flow should be representative of your normal operation. The maximum daily flow is the maximum measured flow occurring over a calendar day. The maximum 30-day flow is the average of measured daily flow over the calendar month of highest flow. The long-term average flow is the average of measure daily flows over a calendar year.

Item III-B

Give the total number of discrete ponds or raceways in your facility. Under "other," give a descriptive name of any structure which is not a pond or a raceway but which results in discharge to waters of the United States.

Item III-C

Use names for receiving water and source of water which correspond to the map submitted in Item XI of Form 1.

Item III-D

The names of fish species should be proper, common, or scientific names as given in special Publication No. 6 of the American Fisheries Society. "A List of Common and Scientific Names of Fishes from the United States and Canada." The values given for total weight produced by your facility per year and the maximum weight present at any one time should be representative of your normal operation.

Item III-E

The value given for maximum monthly pounds of food should be representative of your normal operation.

Item IV

The Clean Water Act provides for severe penalties for submitting false information on this application form.

Section 309(C)(2) of the Clean Water Act provides that "Any person who knowingly makes any false statement, representation, or certification in any application...shall upon conviction, be punished by a fine of no more than $10,000 or by imprisonment for not more than six months, or both."

Federal regulations require the certification to be signed as follows:

A. For corporation, by a principal executive officer of at least the level of vice president.

B. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or

C. For a municipality, State, Federal, or other public facility, by either a principal executive officer or ranking elected official.

Paper Reduction Act Notice

The Public reporting burden for this collection of information estimated to average 4 hours per response. The estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information to the chief, Information Policy Branch (PM-223), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460, and the Office of Information and Regulatory Afairs, Office of Management and Budget, Washington, D.C. 20503, marked Attention: Desk Officer for EPA.

General Permit Application Summary

1.1 Permittee

Owner/Operator: Oppliger Feedyard, Inc.
Address: PO Box 854, Clovis, NM 88101
County: Curry

1.2 Facility Information

Physical Location: 660 Rd 348, Texico, NM 88135
Latitude: 34.3522
Longitude: -103.0456

Maximum Capacity: 18,000 head

1.3 Nature of Business Producing Waste

Concentrated Animal Feeding Operation (CAFO): Beef Cattle Feedyard
SIC No.: 0211

1.4 Type of Containment, Storage and Capacity

Table 1.1: Retention Control Structure (RCS) Summary

RCS #	Design Rainfall Runoff (ac-ft)	Process Generated Wastewater (ac-ft)	Sludge Volume (ac-ft)	Additional Volume (ac-ft)	Required Capacity without Freeboard (ac-ft)	Actual Capacity without Freeboard (ac-ft)	Actual Capacity without Freeboard (gals)
1	26.58	0.83	4.42	0	31.83	32.40	10,557,572

SECTION 2 FACILITY MAPS

Figure 2.1 - Vicinity Map
Figure 2.1, entitled Vicinity Map, was generated in ArcGIS using USGS digital line graph (DLG) transportation data obtained from WebGIS.com. The location of the facility is depicted on the map.

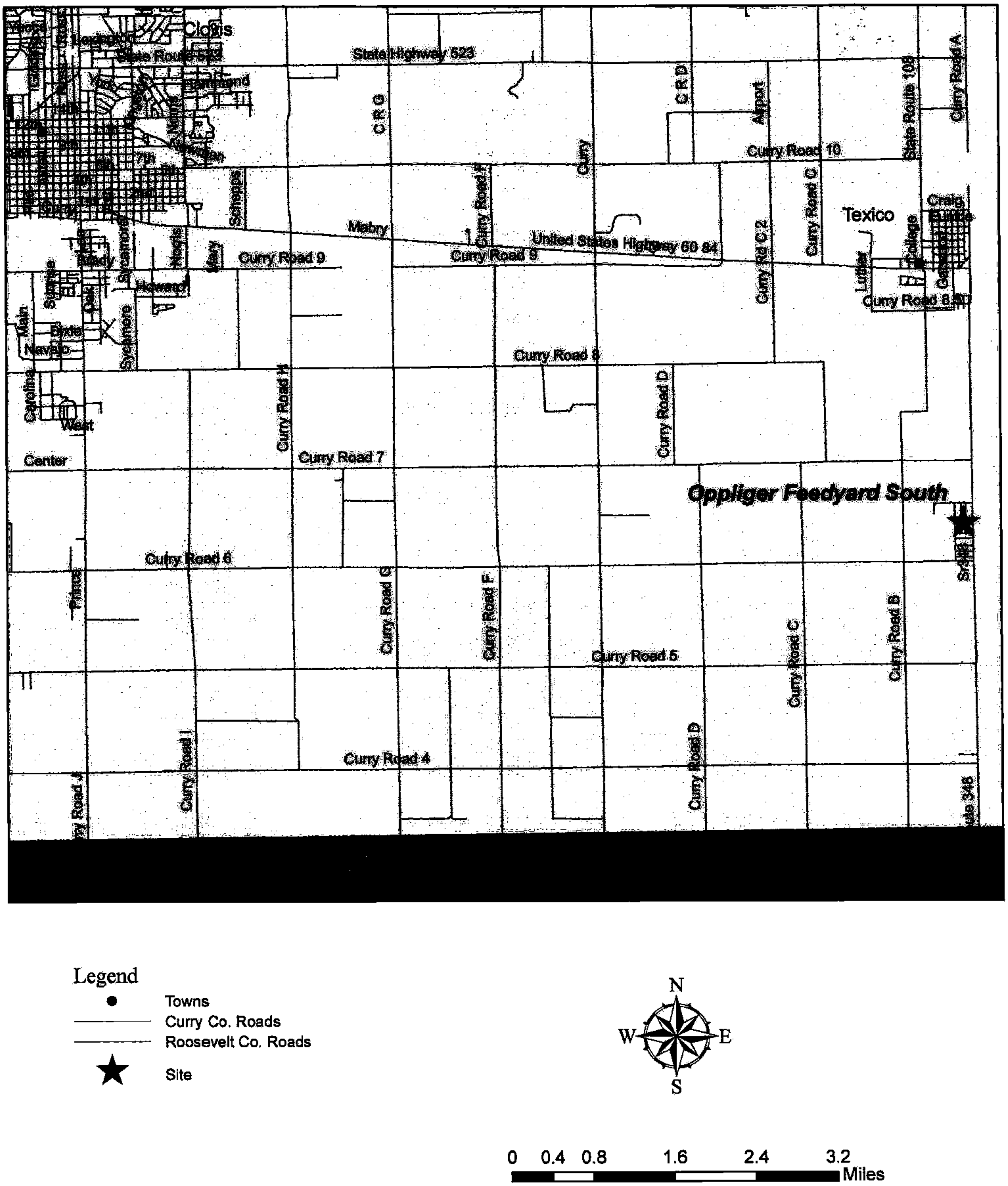
Figure 2.2 – USGS 7.5-Minute Quadrangle Map
Figure 2.2, entitled USGS 7.5-Minute Quadrangle Map is a seamless, high-quality copy of the 7.5-minute USGS quadrangle map (Pleasure Lake, New Mexico/Texas, quadrangle), that depicts the boundaries of land owned, operated, or controlled by Oppliger Feedyard-South and used as part of the concentrated animal feeding operation and all springs, lakes, or ponds located on-site and within one mile of the facility boundaries.

Figure 2.3 –Site Map
Figure 2.3, entitled Site Map, is a scaled drawing depicting the locations of the following information:

- Location of the facility and associated waste retention structures, and associated land application sites
- The site plan will be maintained in the on-site PPP and updated on an as-needed basis.

Figure 2.4 – NRCS Soils Map
Figure 2.4, entitled NRCS Soils Map, was generated in ArcGis using SSURGO soils data obtained from the USDA Geospatial website. Soil descriptions are included in supporting documentation.

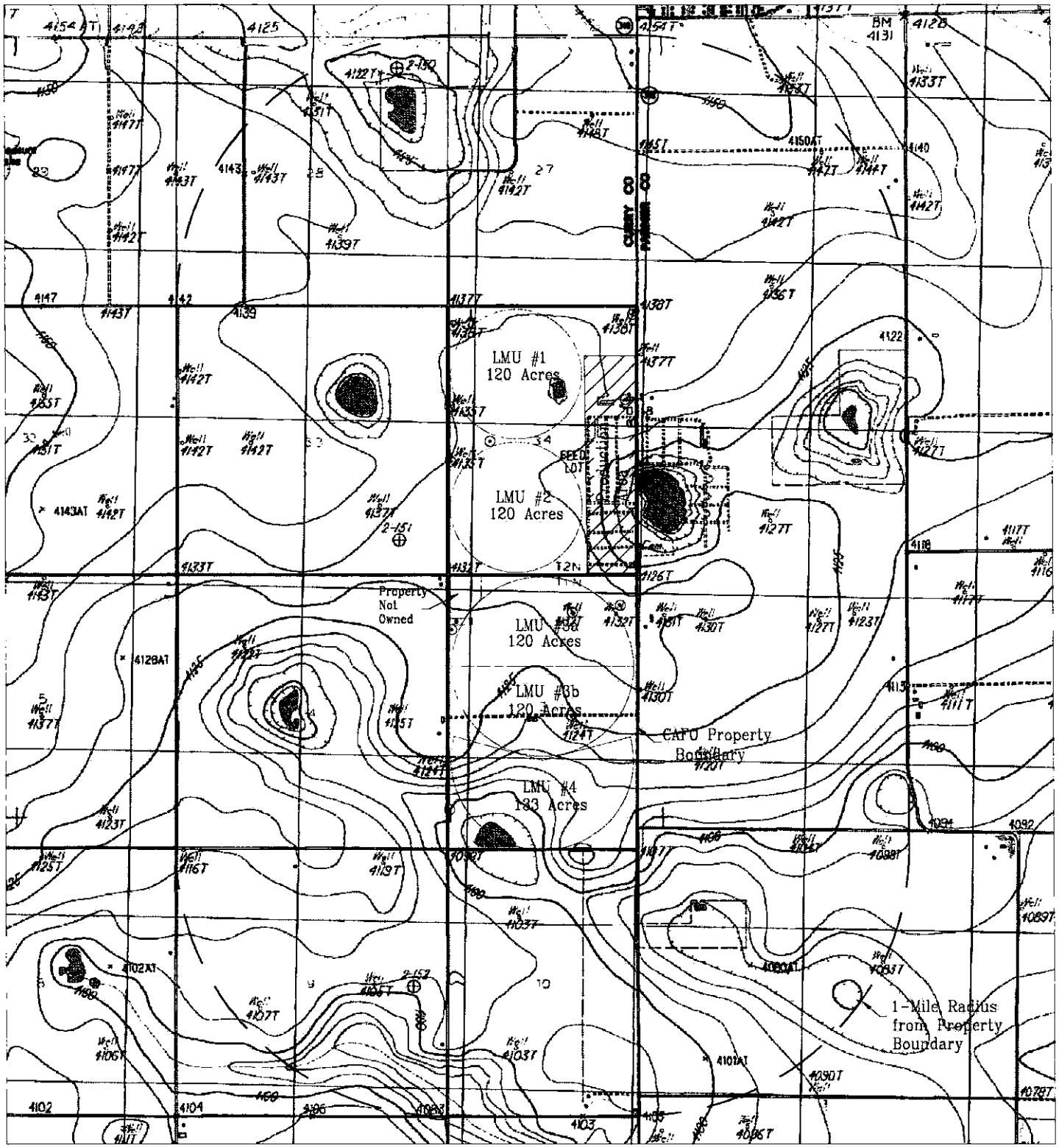
Figure 2.5 – FEMA Floodplain Map
Figure 2.5 is a map obtained from the FEMA Map Service Center.



Oppliger Feedyard South
Curry County, NM

Vicinity Map
Figure 2.1

ENVIRO-AG EAE ENGINEERING, INC.
Enviro-Ag Engineering, Inc.
ENGINEERING CONSULTANTS
3404 Airway Blvd
Amarillo, Texas 79118
806-353-6123; FAX 806-353-4132



Source: TOPO! Software, National Geographic Seamless Topographic Maps on CD-Rom, 2001. Pleasure Lake, NM TX, 1980

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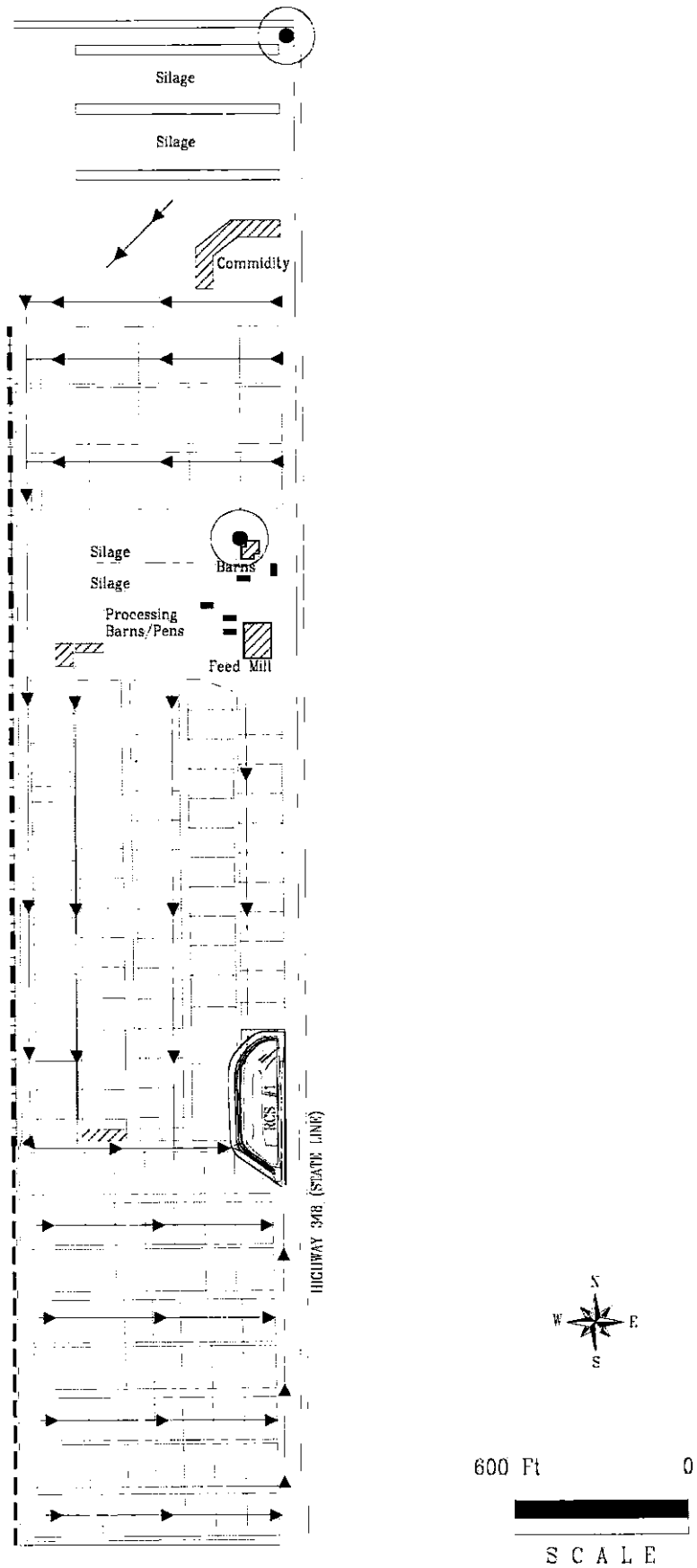
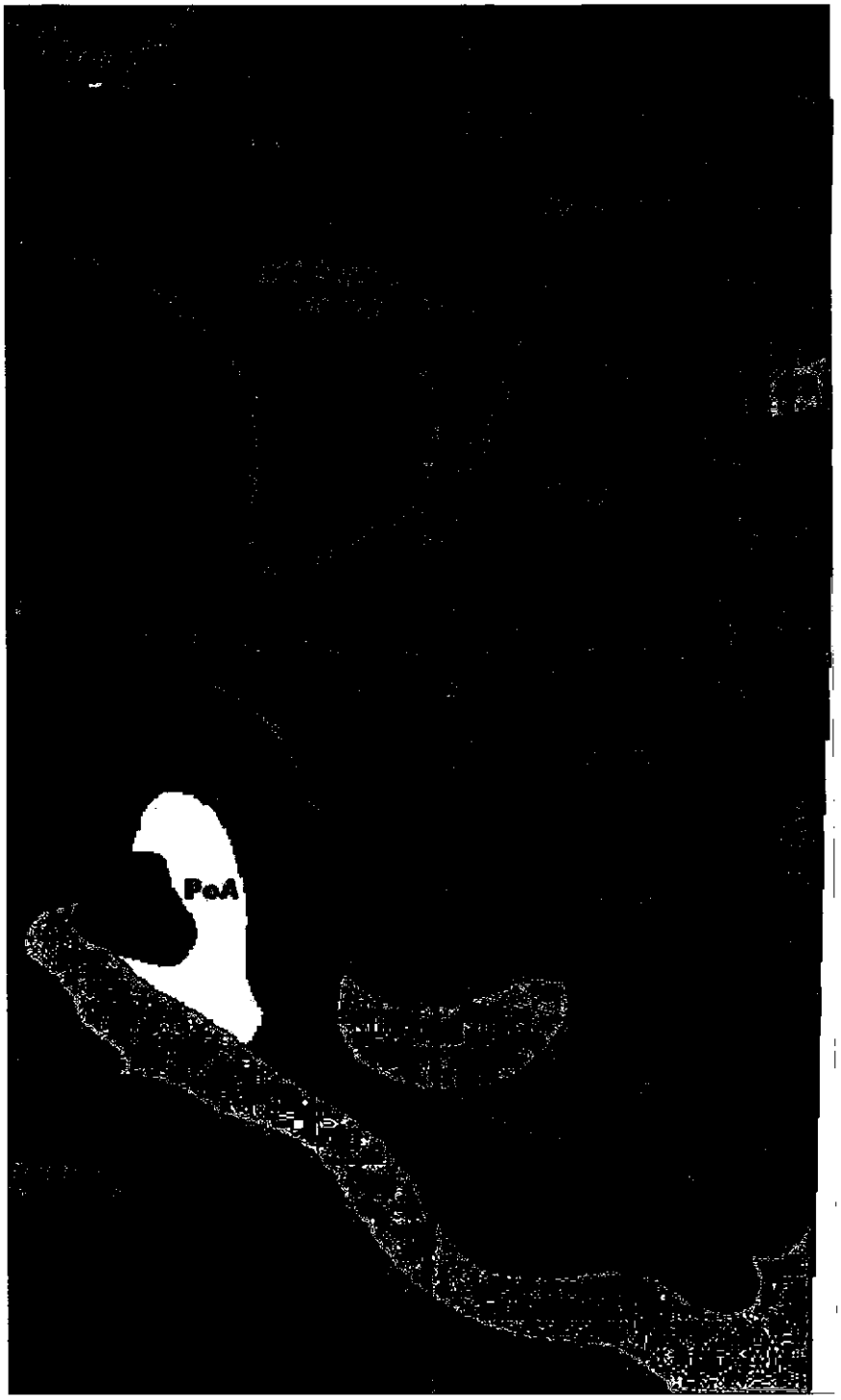
SCALE

Oppliger Feedyard South Farwell Curry County, NM	USGS 7.5-Minute Quadrangle Map Figure 2.2	ENVIRO-AG ENGINEERING, INC. Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 3404 Airway Boulevard AMARILLO, TEXAS 79118 TEL (806) 353-6123 FAX (806) 353-4132



Legend:
- ⊙ Denotes Well with Buffer and/or BMPs
- ►► Denotes Drainage
- - - Denotes Diversion Ditch
- — — Denotes Berm

Oppliger Feedyard South Farwell Curry County, NM	Site Map Figure 2.3 Revised	ENVIRO-AG ENGINEERING, INC. Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 3404 Airway Boulevard AMARILLO, TEXAS 79118 TEL (806) 353-6123 FAX (806) 353-4132



Soil Unit Name and Symbol Legend:
AcA – Acuff loam, 0 to 1% slopes
AfA – Acuff loam, 0 to 1% slopes
AfB – Acuff loam, 1 to 3% slopes
EsA – Estacado loam, 0 to 1% slopes
PeB – Pep loam, 1 to 3% slopes
RcA – Ranco clay, 0 to 1% slopes

Refer to supporting documentation for soil description information.

Source: Soil Data Mart. Available at; http://soildatamart.nrcs.usda.gov/ – Curry County, NM Soils – Accessed 24 October 2007. Tiger Roads, Available Curry County, NM Roads – Accessed 8 March 2002.

N
W E
S

1/4-MI 0

SCALE

Oppliger Feedyard South Farwell Curry County, NM	NRCS Soil Map Figure 2.4	ENVIRO-AG ENGINEERING, INC. Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 3404 Airway Boulevard AMARILLO, TEXAS 79118 TEL (806) 353-6123 FAX (806) 353-4132

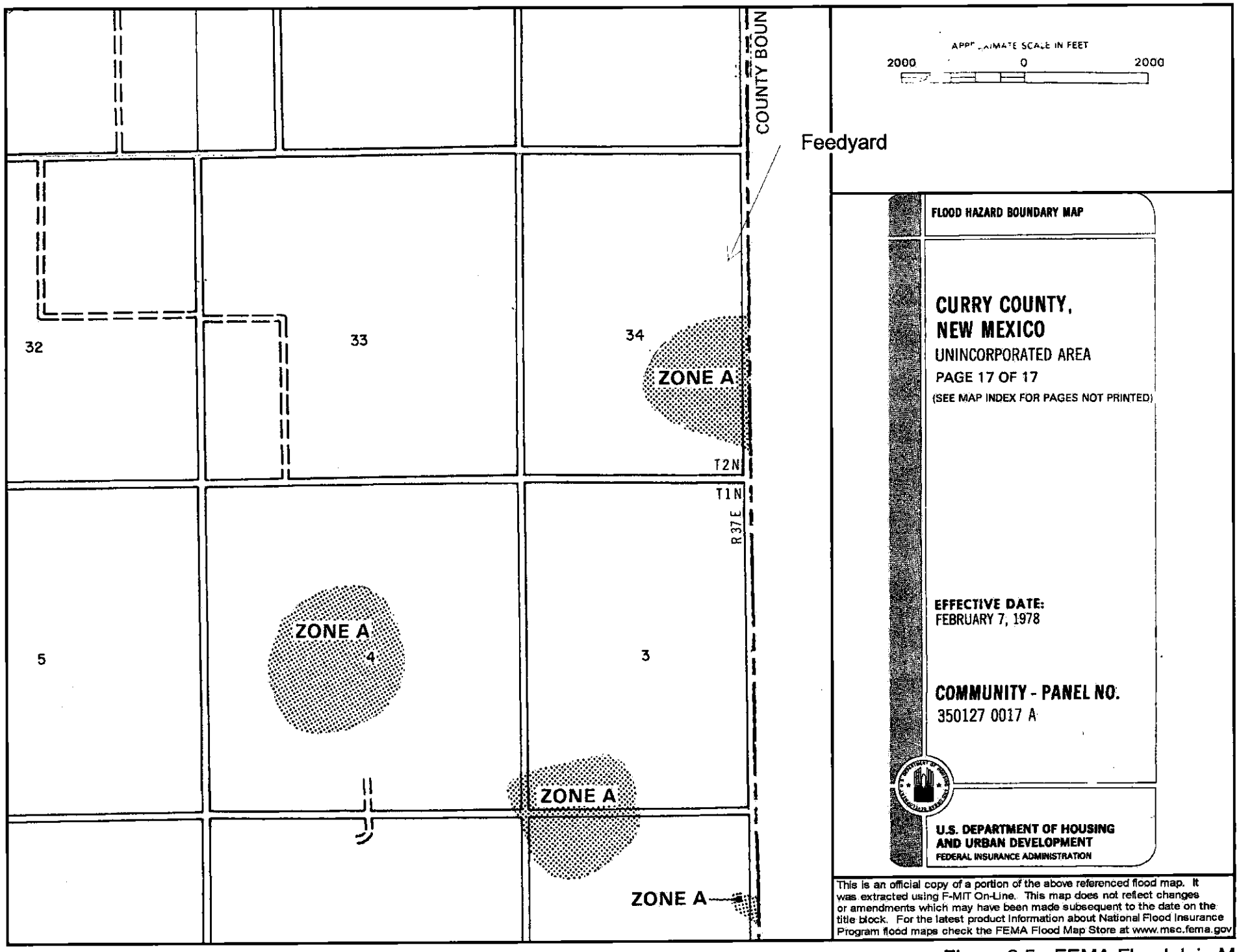


Figure 2.5 - FEMA Floodplain Map

SECTION 3 PRODUCTION AREA

3.1 Storage of Manure and Process Wastewater

The CAFO will ensure adequate storage of manure, litter, and process wastewater (trough overflow), including procedures to ensure proper operation and maintenance of the storage facilities. Figure 3.1, Manure & Wastewater Flow Chart shows the waste handling and storage practices at the feedyard.

3.1.1 Manure Production

The manure and nutrient production for the feedyard was calculated using ASABE Standards (ASAE D384.2 MAR05, Table 1.b – Section 3). Table 1.1, entitled Estimated Manure Production Data for a Feedyard Facility, is included as a summary of the annual manure and nutrient production for the facility. The totals in Table 1.1 represent as-excreted manure and nutrient values for the maximum head count shown in the application. This data is intended for planning and design purposes and is not to be used for whole-farm nutrient mass balance calculations.

Excess manure not utilized by the facility is transferred to a third party for beneficial use. All open lot pen manure is dry scraped and stockpiled in the pen area. Manure is periodically removed from the pens by a contract manure hauler.

3.1.2 Process Generated Wastewater Volume

This facility has one source of process generated wastewater in the form of trough overflow during the winter months. All open lot pen manure is dry scraped. The design storage volume for process generated wastewater is 30 days and is calculated in Table 4.2.

3.1.3 25-Year, 24-Hour Rainfall Storage Volume

Each drainage area runoff volume is calculated using curve numbers (CN) applied with a 25-year, 24-hour storm. The 25-year, 24-hour storm event for this location is 4.8 inches of rainfall. Table 4.2 show the calculated storage volumes required in each pond for the rainfall runoff from a 25-year, 24-hour storm.

3.1.4 Sludge Accumulation Volume

An estimated sludge accumulation volume for RCS #1 was calculated to be 20% of the 25-year, 24-hour storm volume from the open lot pen area.

3.1.5 Water Balance Model

Table 3.3, Water Balance Model Irrigation and Evaporation, considers inflows and withdrawals to the RCS, including rainfall runoff, direct rainfall, process generated wastewater, evaporation, and irrigation demand.

3.1.6 Facility Certifications

The retention pond has been certified by a Professional Engineer for soil liner and capacity. These certifications for each retention pond are maintained on-site.

3.2 Clean Water Diversion

The facility will ensure that clean water resulting from a 25-year, 24-hour storm event is diverted, as appropriate, from the production area. Where clean water is not diverted, the facility has taken into account this area in the required storage capacity. Table 3.1 identifies the clean water diversions used at this facility.

Table 3.1: Clean Water Diversion

Check applicable:	Type:	Location Used:
☑	Berms	Located along western boundary of feeding pens.
☐	Channels	
☑	Diversion Ditches	Located along western boundary of feeding pens.
☐	Natural Topography	
☑	Other (specify)	Farm to Market Roads and County Roads are along the east and north side of the production area. Facility road along the west side.

3.3 Mortality Management

The facility will properly dispose of dead animals within three (3) days. Mortalities must not be disposed of in any liquid manure or process wastewater system that is not specifically designed to treat animal mortalities. Animals shall be disposed of in a manner to prevent contamination of waters of the United States or creation of a public health hazard. Table 3.2 identifies the method(s) of animal mortality handling used at this facility.

Table 3.2: Handling Method

Check applicable:	Type:
☐	Composting
☑	Rendering
☐	Burial
☐	Other (specify)

3.4 Prevention of Direct Contact of Animals with Waters of the United States

Animals confined at the CAFO shall not be allowed to come into direct contact with waters of the United States.

Do waters of the U.S. flow through the production area? ☐ Yes ☑ No

Do animals have access to waters of the United States? ☐ Yes ☑ No

If yes, identify measures used to prevent direct contact of animals with waters of the United States.

- If applicable, fences may be used to restrict such access.

Definition:

Waters of the United States or waters of the U.S. means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate ``wetlands;"

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, ``wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) ``Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. [See Note 1 of this section.] Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

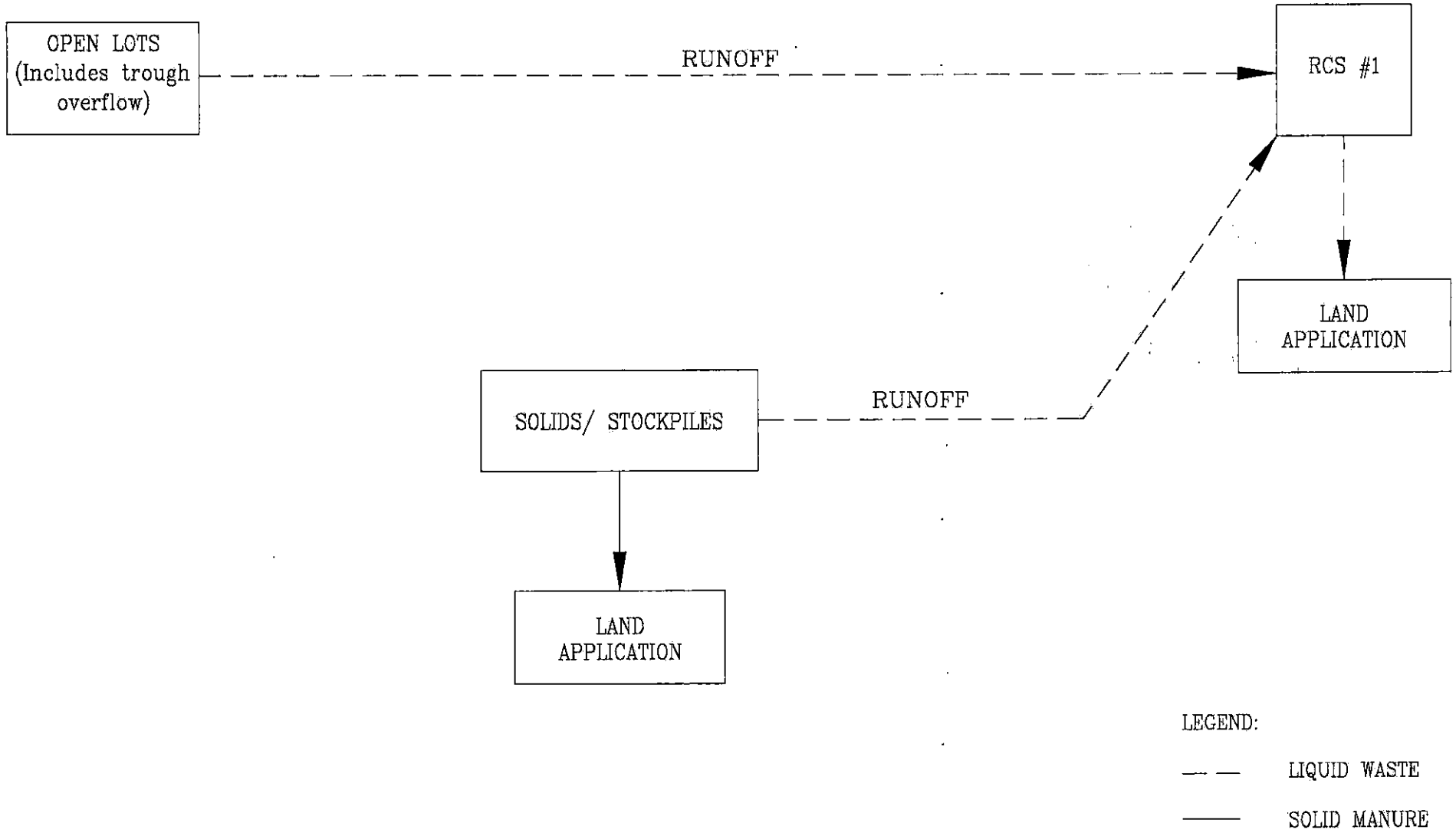
3.5 Chemical and other Contaminant Handling

The CAFO will ensure that chemicals and other contaminants handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage system unless specifically designed to treat such chemicals or contaminants. All wastes from dipping vats, pest and parasite control units, and other facilities utilized for the management of potentially hazardous or toxic chemicals shall be handled and disposed of in a manner sufficient to prevent pollutants from

entering the manure, litter, or process wastewater retention structures or waters of the United States.

Check all that are applicable:

- ☐ Chemicals are used and empty containers are disposed of in accordance with manufacturer's guidelines.
- ☐ Where are chemicals stored? _____
- ☐ Storage is covered?
- ☐ Storage has secondary containment?
- ☐ Chemicals are stored in proper containers?
- ☐ Where are chemicals disposed? In accordance with manufacturer's recommendations; in compliance with local, state and federal regulations.
- ☑ No chemicals are used at this facility. Based on discussions with the feedyard, no chemicals are stored on-site.
- ☐ Other: _____



Oppliger Feedyard
South
Curry County, NM

Manure & Wastewater Flow Chart
Figure 3.1

ENVIRO-AG ENGINEERING, INC.
Enviro-Ag Engineering, Inc.
ENGINEERING CONSULTANTS
3404 Airway Blvd.
AMARILLO, TEXAS 79118
TEL (806) 353-6123 FAX (806) 353-4132

ESTIMATED MANURE PRODUCTION
for a FEEDYARD FACILITY
Table 1.1
ENVIRO-AG ENGINEERING, INC.

NAME OF CAFO: Oppliger Feedyard South
LOCATION: Curry County, NM
DATE: August-07

MANURE PRODUCTION CRITERIA (a)	
FACILITY TOTAL	**Beef Cattle**
1. Number of Animals (head):	**18,000**
2. Finishing time period, days (b):	153
4. Total Solids Production (Dry Manure), lbs/day:	91,765
5. Dry Manure Production, tons/year	16,747
6. Total Nitrogen Production, lbs/day:	6,471
7. Total Phosphorus, P2O5 lbs/day (c)	1,967
8. Total Potassium, K2O lbs/day (c)	5,365

NOTES:
(a) - Manure and nutrient production values are taken from American Society of Agricultural and Biological Engineers Data: (ASAE D384.2 MAR05) Manure Production and Characteristics, Table 1.a - Section 3.
(b) - ASAE beef cattle values based on an assumed finishing time period of 153 days.
(c) - ASAE reports P and K in the elemental forms. Convert to P2O5 by multiplying by 2.29 and to K2O by multiplying by 1.2.

REQUIRED STORAGE VOLUMES
for RETENTION CONTROL STRUCTURES
Table 4.2
ENVIRO-AG ENGINEERING, INC.

NAME OF CAFO: Oppliger Feedyard South
LOCATION: Curry County, NM
DATE: August-07

PARAMETER		RCS #1
1. Processed Generated Water Storage and Rainfall Runoff Storage		
a. Trough Overflow between Nov. - Feb. (gal/head/day):		0.5
b. Number of Head:		18,000
c. Volume of Process Water (gal/day):		9,000
d. Number of Days of Storage:		30
e. Storage Volume for Process Water (gal)		270,000
	ac-ft	0.83
2. Drainage Areas	CN	Area (ac)
a. Pen/Open Lot areas	90	72
b. Adjacent area between pens and RCS	74	20
c. Roofed/Paved areas	90	0
d. RCS surface area	100	2
e. Total Area (acres)		94
3. 25-Year, 24-Hour Rainfall Event	(inches)	4.8
4. Runoff Volume Determination (a)	(inches)	(ac-ft)
a. Pen Area	3.68	22.10
b. Adjacent Area	2.21	3.68
c. Roof Area	3.68	0.00
d. RCS Surface Area	4.80	0.80
e. Total Runoff (ac-ft):		26.58
5. Summary of Required Storage Volumes		(ac-ft)
a. Processed Water Storage		0.83
b. Required Volume for Rainfall Runoff		26.58
c. Sludge Accumulation Volume (b)		4.42
d. Additional Required Volume from Water Balance		0.00
Total Volume Required for RCSs		**31.83**
	Certified Volume of RCS	**32.40**

NOTES:
a. Using SCS method:
Where:

$S = (1000/CN) - 10$
$Q = ((P - 0.2S)^2)/(P + 0.8S)$
S = Potential maximum retention after runoff begins(in)
Q = Runoff (in)
P = 25-year, 24-Hour rainfall (in)
CN = Curve Number from SCS 210-VI-TR-55, 2nd Edition, June 1986

b. Sludge accumulation is estimated at 20% of runoff from the pen area.

BRAD J. WIECK
NEW MEXICO
14900
REGISTERED PROFESSIONAL ENGINEER

Brad J. Wieck, PE
8/27/2007

WATER BALANCE MODEL
IRRIGATION AND EVAPORATION for RCS 1

Table 1.3
ENVIRO-AG ENGINEERING, INC.

NAME: Oppliger Feedyard South
LOCATION: Curry County, NM
DATE: August-07

HYDROLOGIC CHARACTERISTICS			
Pen Area (acres):	65		
Adjacent Areas (acres):	25.5		
Roof Area (acres):	1.5		
Total RCS Surface Area (acres):	2.0		
Total Irrigated Area (acres):		240.0	240.0
Cropping scheme:		Corn	Wheat
Effective Evaporation Surface Area (acres):	1.7		

IRRIGATION CELL VOLUME SUMMARY DATA	
25-Year, 24-Hour Rainfall Volume (ac-ft):	24.6
Process Generated Wastewater Volume (ac-ft):	0.9
Sludge Accumulation Volume (ac-ft):	2.4
Additional Volume (ac-ft):	1.9
Total Required Capacity (ac-ft):	29.8

	RCS INFLOW CALCULATIONS					HYDRAULIC CROP DEMAND CALCULATIONS					RCS STORAGE SUMMARY			
MONTH	(1) (inches)	(2) (inches)	(2) (inches)	(3) (ac-ft)	(4) (ac-ft)	(5) (inches)	(6) (inches)	(6) (inches)	(7) (ac-ft)	(7) (ac-ft)	(8) (inches)	(9) (ac-ft)	(10) (ac-ft)	(11) (ac-ft)
													start value --->	3.9
JAN	0.5	0.0	0.0	1.0	1.1	0.5	0.0	0.0	0.0	0.0	2.7	0.4	0.0	4.6
FEB	0.4	0.0	0.0	0.9	1.0	0.4	0.0	0.0	0.0	0.0	2.9	0.4	0.0	5.2
MAR	0.7	0.0	0.0	0.1	0.3	0.7	0.0	0.0	0.0	0.0	4.6	0.7	0.0	4.8
APR	1.0	0.1	0.0	0.1	0.7	1.0	0.0	3.3	0.0	45.2	6.1	0.9	2.3	2.4
MAY	2.0	0.5	0.0	0.1	3.2	2.0	0.0	5.3	0.0	64.8	7.1	1.0	2.2	2.4
JUN	2.6	0.8	0.0	0.1	5.3	2.6	3.0	2.7	8.0	2.0	8.0	1.1	4.1	2.4
JUL	2.6	0.8	0.0	0.1	5.4	2.6	6.5	0.0	77.8	0.0	8.2	1.2	4.2	2.4
AUG	3.0	1.1	0.1	0.1	6.8	3.0	7.1	3.4	83.0	8.6	6.7	0.9	5.9	2.4
SEP	2.1	0.5	0.0	0.1	3.5	2.1	4.2	3.9	41.4	35.4	5.3	0.8	2.8	2.4
OCT	1.8	0.3	0.0	0.1	2.4	1.8	0.0	2.5	0.0	14.6	4.1	0.6	1.8	2.4
NOV	0.6	0.0	0.0	0.9	1.1	0.6	0.0	0.0	0.0	0.0	2.8	0.4	0.0	3.1
DEC	0.6	0.0	0.0	1.0	1.1	0.6	0.0	0.0	0.0	0.0	2.3	0.3	0.0	3.9
TOTALS	17.9	4.1	0.1	4.4	31.9	17.9	20.8	21.1	210.2	170.6	60.7	8.6	23.3	

NOTES:
(1) AVERAGE PRECIPITATION - Average precipitation taken from the Western Regional Climate Center for Clovis, NM (1910-2005).
(2) RUNOFF PENS AND ADJACENT AREA - Runoff from pens, adjacent areas calculated using SCS Curve Number Method adjusted from 1 to 30-day Curve Number.
(Ref. USDA-SCS, Texas Engineering Technical Note No. 210-18-TX3, Figure 1, March 1983).
(3) PROCESS INFLOW - Process Inflow is calculated from process generated wastewater, Table 1.2.
(4) TOTAL INFLOW - Total Inflow is calculated as that volume of rainfall that falls on the RCS and process water that enters the RCS.
(5) RAINFALL ON IRRIGATED AREA - Monthly rainfall on the irrigated area.
(6) CONSUMPTIVE USE - values taken from crops on irrigated land. (Ref. NRCS CNMP Refresher Course on CD_ROM / CU Values, August 2002)
(7) NET CROP DEMAND - Net Crop Demand = ((Consumptive Use(6) - Effective Rainfall(5))/12) x Irrigated Area.
(8) EVAPORATION - 70 % of Average PAN Evaporation taken from the Western Regional Climate Center for Clovis, NM (1929-2002).
(9) NET POND EVAPORATION - Net Evaporation from the water surface is taken as (Monthly Lake Surface Evap/12) x (RCS Surface Area).
(10) ACTUAL WITHDRAWAL - Actual Withdrawal from the irrigation cell not to exceed Net Crop Demand. (No consideration given for nutrient demand of crop)
(11) STORAGE AT END OF MONTH - Storage volume in the irrigation cell at the end of the month. The storage calculated in this column should not encroach in the volume reserved for the 25-year, 24-hour rainfall event.

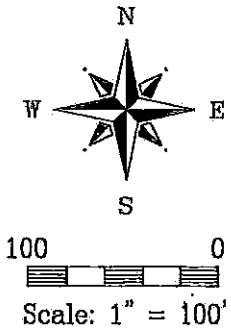
BRAD J. WIECK
NEW MEXICO
14900
REGISTERED PROFESSIONAL ENGINEER

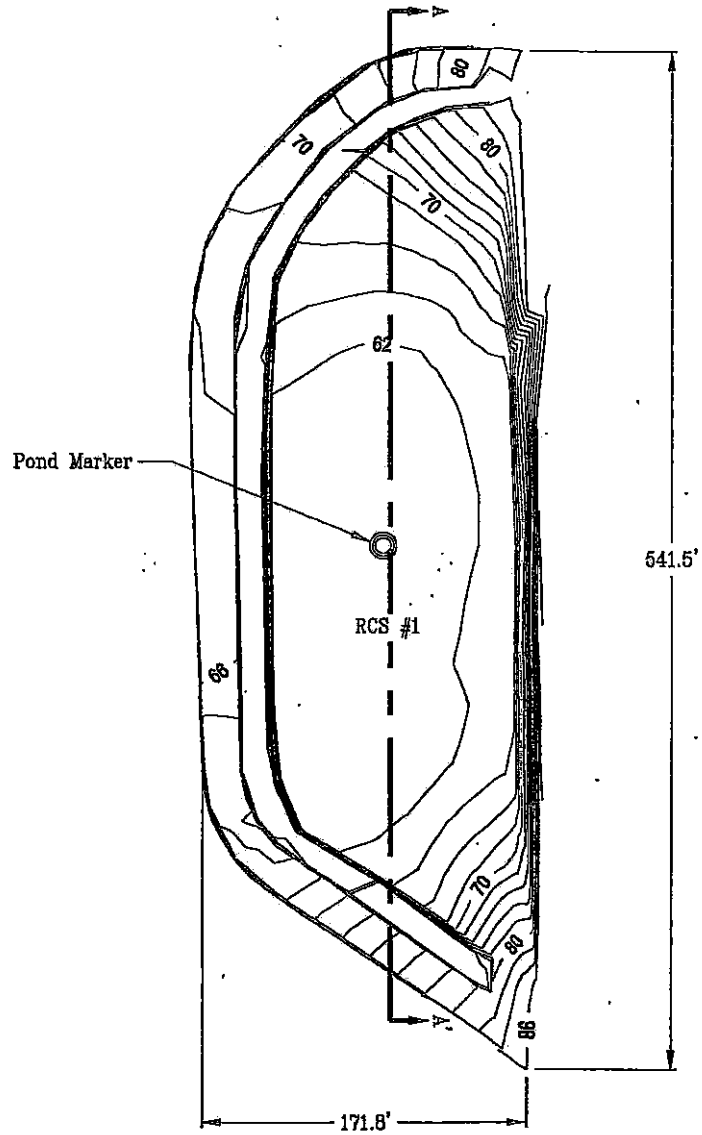
Brad J. Wieck, PE
8/27/2007

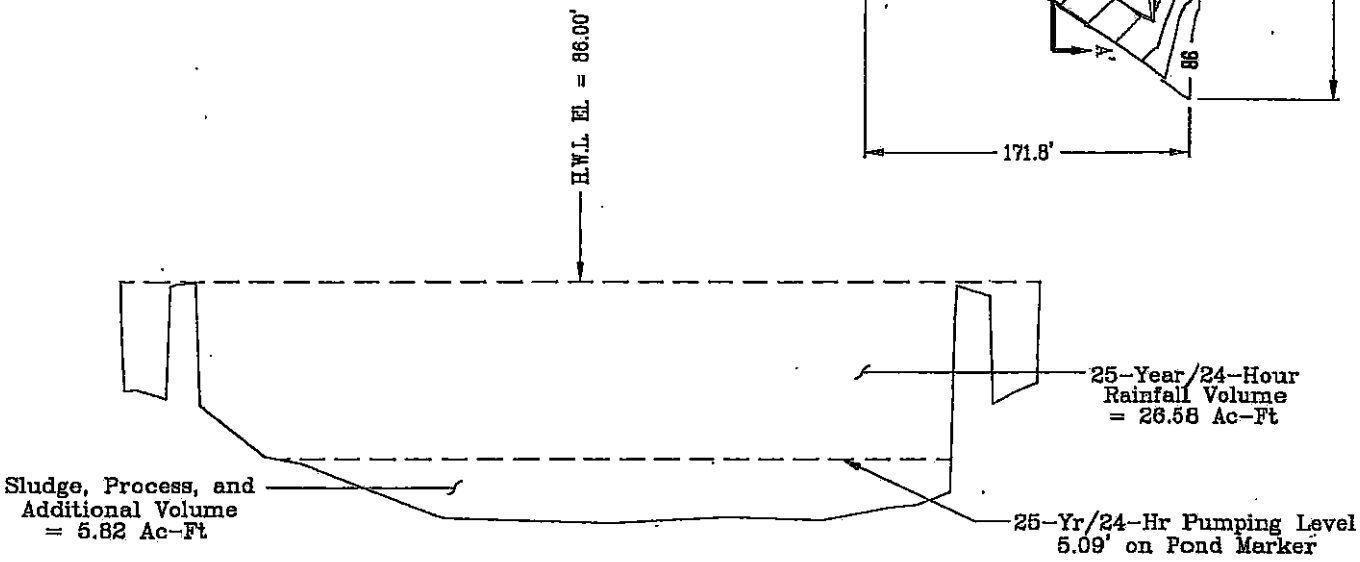
Oppliger Feedyard South

RCS #1 volume data
Date Surveyed: 02/12/2005
SURVEYED BY: DB KB

H.W.L. Elevation @ 2' Freeboard	86.00'
Capacity at H.W.L.	32.40 Ac-Ft
Surface Area @ Design H.W.L.	7.64 Acres







Cross-Section A - A'
Not to Scale

Oppliger Feedyard South **Curry County, New Mexico**	**RCS #1 Capacity Drawing** **Plan and Profile**	ENVIRO-AG EAE ENGINEERING, INC. **Enviro-Ag Engineering, Inc.** ENGINEERING CONSULTANTS 3404 Airway Boulevard AMARILLO, TEXAS 79118 TEL (806) 353-6123 FAX (806) 353-4132

ATKINS ENGINEERING ASSOCIATES INC.

December 16, 2002

Chet Wyant
EnviroCompliance Services, Inc.
212 Tucker Ave.
Clovis, New Mexico 88101

Re: Hydrologic Conditions Oppliger Feed Yard, Curry County New Mexico

Dear Mr. Wyant,

This letter is provided to describe any hydrologic connection between ground-water and surface water in the location of Oppliger Feed Yard, within Section 34, Township 2 North, Range 37 East, N.M.P.M.

Ground-water in this area is found within the Ogallala aquifer at a depth of 250 to 275 feet below land surface. The general direction of ground-water flow in the aquifer is eastward at an average gradient of approximately 10 to 15 feet per mile. Discharge from the Ogallala aquifer in Curry County, New Mexico occurs through ground-water pumpage and subsurface flow moving eastward into Texas.

There are no perennial streams in the area, and there is no hydrologic connection between ground-water and surface water in this area.

Sincerely,

Jackie D. Atkins, PE, PS, ES
Atkins Engineering Associates, Inc.

JDA/bam

References:

1. Ground-water level data of U.S.G.S. and the New Mexico State Engineer
2. "Reconnaissance of Ground-water Conditions in Curry County, New Mexico", NMSE Technical Report No. 1, J. W. Howard, Jr., 1954, 39 p.
3. "Geology and Aggregate Resources, District II", New Mexico State Highway Department, 1972, 65 p., 38 mapsheets.

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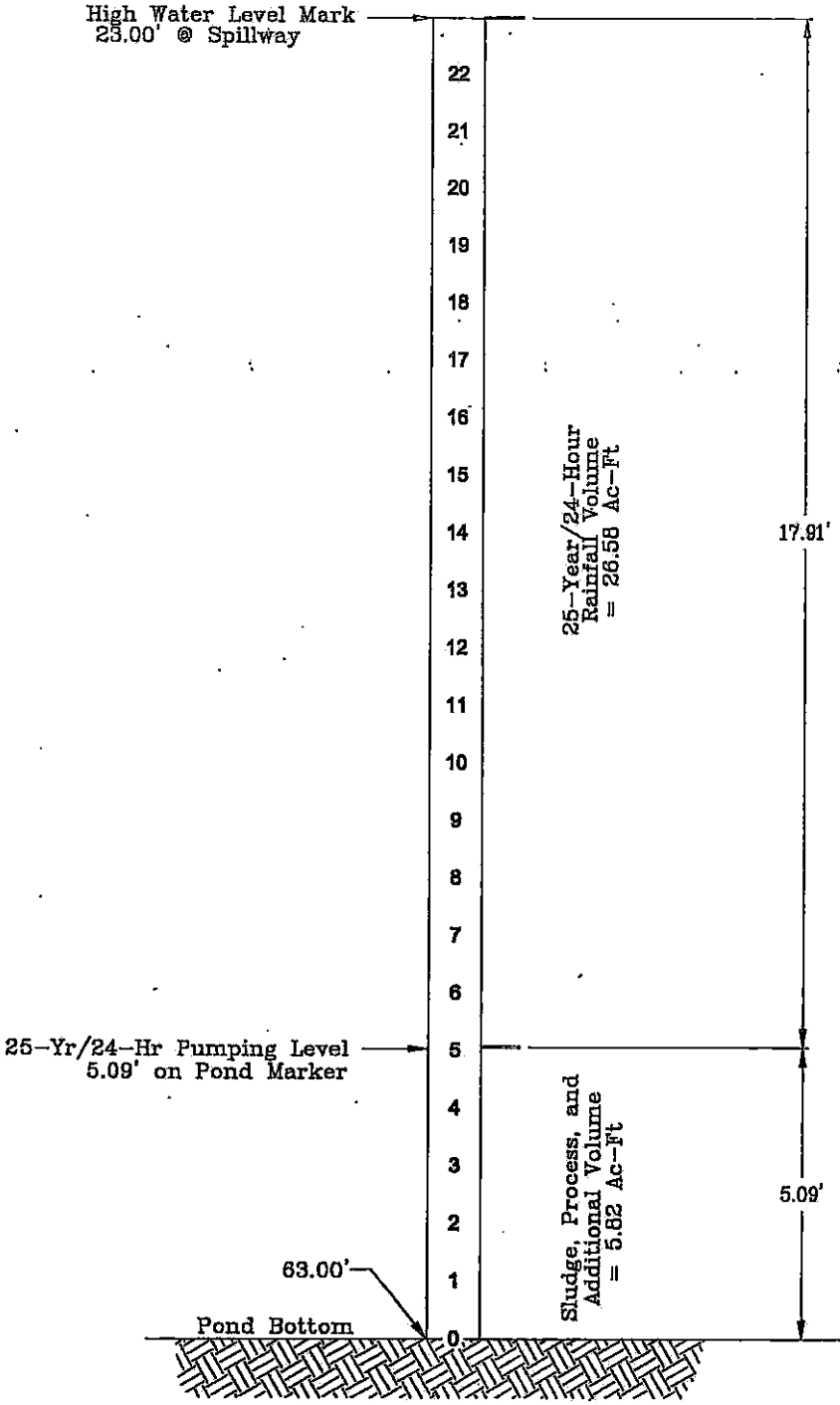


Cumulative Volume	Gallons By Foot
32.40 Ac-Ft	596,307 Gal.
30.55 Ac-Ft	553,947 Gal.
28.85 Ac-Ft	534,396 Gal.
27.21 Ac-Ft	527,879 Gal.
25.59 Ac-Ft	521,362 Gal.
23.99 Ac-Ft	511,586 Gal.
22.42 Ac-Ft	501,811 Gal.
20.88 Ac-Ft	495,294 Gal.
19.36 Ac-Ft	485,518 Gal.
17.87 Ac-Ft	479,001 Gal.
16.40 Ac-Ft	465,967 Gal.
14.97 Ac-Ft	462,708 Gal.
13.55 Ac-Ft	449,674 Gal.
12.17 Ac-Ft	439,899 Gal.
10.82 Ac-Ft	430,123 Gal.
9.50 Ac-Ft	420,348 Gal.
8.21 Ac-Ft	410,572 Gal.
6.95 Ac-Ft	397,538 Gal.
5.73 Ac-Ft	377,987 Gal.
4.57 Ac-Ft	355,178 Gal.
3.48 Ac-Ft	296,524 Gal.
2.57 Ac-Ft	267,198 Gal.
1.75 Ac-Ft	570,239 Gal.

Oppliger Feedyard South Curry County, New Mexico	RCS #1 Capacity Drawing Pond Marker Schematic	ENVIRO-AG EAE ENGINEERING, INC. Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 3404 Airway Boulevard AMARILLO, TEXAS 79118 TEL (806) 353-6123 FAX (806) 353-4132

SECTION 4 LAND APPLICATION

4.1 Conservation Practices

4.1.1 Conservation Practices for Land Application Sites

The facility will identify appropriate site specific conservation practices to be implemented, including as appropriate buffers or equivalent practices, to control runoff of pollutants to waters of the United States and specifically, to minimize the runoff of nitrogen and phosphorus. These practices may include, but are not limited to, residue management, conservation crop rotation, grassed waterways, strip cropping, vegetated buffers, riparian buffers, setbacks, terracing, and diversions. Table 4.1 indicates the best management practices that are being implemented to control runoff of pollutants to surface water:

Table 4.1: Conservation Practices

Conservation Practice:	**Land Application Site ID where the practice is being implemented:**
Vegetative Buffer	n/a
Setback	Compliance alternative used for wells – Refer to Section 4.4.
Conservation Tillage	LMU 1-3 – Minimal tillage (such as strip and no till are used on these fields.
Grass Filter Strips	n/a
Terraces	n/a
Tailwater Control	
Other (describe):	

4.2 Land Application Protocols

4.2.1 Best Management Practices

No land application will be made to a land application site that will exceed the planned crops. The following Best Management Practices (BMPs) are employed by the facility to ensure the loss of nutrients is minimized:

- Incorporate waste with tillage equipment.
- Adjust sprayers and spreaders so the waste is applied at low pressure and apply waste as close to the ground as possible.
- Apply manure during times when air is warming and rising from the ground.
- Manure will be incorporated as soon as possible after application; unless the field has perennial vegetation or is no-tilled cropped.
- When wastewater is sprinkler applied, the soil water holding capacity of the soil shall not be exceeded.

- Manure or wastewater will not be applied to saturated or frozen soils.

4.2.2 Application Methods

1. Method(s) of manure (solids or semi-solid) application?
   - ☑ Dry Manure Spreader
   - ☐ Honey wagons
   - ☐ Injectors
   - ☐ Injectors
   - ☐ Traveling Gun
   - ☐ Spreader Bar

2. Method(s) for wastewater application?
   - ☑ Center Pivot
   - ☐ Flood Irrigation
   - ☐ Furrow Irrigation
   - ☐ Traveling Gun
   - ☐ Stationary Gun

4.3 Land Application Equipment Inspections

Manure and wastewater shall be applied as uniformly as possible with the properly calibrated equipment. Center pivots and manure spreaders for broadcast application will be checked annually/seasonally to ensure that application rates are accurate. All other equipment and components of the waste management systems shall be checked on a regular basis and during application periods. Adequate maintenance will be supplied to equipment that may have the potential to cause spills.

4.4 Setback Requirements

Manure, litter, or process wastewater must not be applied closer than one-hundred (100) feet to any down-gradient water of the United States, open tile line intake structures, sinkholes, agricultural well heads, or other conduits to waters of the United States. The permittee may elect to use a 35-foot vegetated buffer where applications of manure, litter, or process wastewater are prohibited as an alternative to the 100-foot setback to meet this requirement.

As a compliance alternative, the permittee may demonstrate that a set-back or buffer is not necessary because implementation of alternative conservation practices or field-specific conditions will provide pollutant reductions equivalent or better than the reductions that would be achieved by the 100-foot setback.

In regards to agricultural well heads located within 100-feet of a wastewater land application field, the facility shall document additional wellhead protective measures will be or have been implemented that will prevent pollutants from entering the well and contaminating the groundwater. Additional protective measures may include a protective structure, sanitary seal, annular seal, a steel sleeve or surface slab. Those protective measures shall be used as a compliance alternative to the setback.

4.5 Phosphorus and Nitrogen Transport

The application rate calculation shall be based on the results of a field specific assessment of the potential for nitrogen and phosphorus transport from the field to surface waters using the assessment tools and procedures described in New Mexico NRCS Conservation Practice Standard 590 (Nutrient Management), including the New Mexico Phosphorus Index (New Mexico NRCS Agronomy Technical Note 57). The outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field is included in Section 5.

LAND APPLICATION DATA
Table 5.1

Facility Name: Oppliger South

This spreadsheet shall be filled out for each field to which manure, slurry or wastewater will or may be applied for next five (5) years.

Field ID	Crop 1 (a)	Crop 2 (a)	Alternative Crops (b)	Irrigated ☑	Dryland ☑	Phosphorus Risk Assessment (c)	Time of Year when Application will Occur (season)	Potential Application Frequency (per month)	Form of Waste (liquid, solid or slurry)	Method of Application (pivot, spreader, etc.)	Manure Incorporated or Broadcast?	Frequency of Application (annual or biannual, biennial)
1	Corn Silage	Small Grain (SG) Silage	Sorghum/SG Silage	x		2	Spring/Summer/Fall	1	Liquid	Pivot	N/A	A
			Forage Sorghum	x		2	Summer	1	Liquid	Pivot	N/A	A
			SG Silage	x		2	Fall/Spring	1	Liquid	Pivot	N/A	A
			Cotton	x		2	Summer/Fall	1	Liquid	Pivot	N/A	A
			SG Grazing	x		2	Fall/Spring	1	Liquid	Pivot	N/A	A
			Corn (Grain or Silage)	x		2	Spring/Summer	1	Liquid	Pivot	N/A	A
2	Corn Silage	SG Silage	Sorghum/SG Silage	x		2	Spring/Summer/Fall	1	Liquid	Pivot	N/A	A
			Forage Sorghum	x		2	Summer	1	Liquid	Pivot	N/A	A
			SG Silage	x		2	Fall/Spring	1	Liquid	Pivot	N/A	A
			Cotton	x		2	Summer/Fall	1	Liquid	Pivot	N/A	A
			SG Grazing	x		2	Fall/Spring	1	Liquid	Pivot	N/A	A
			Corn (Grain or Silage)	x		2	Spring/Summer	1	Liquid	Pivot	N/A	A
3A	Corn Silage	Small Grain (SG) Silage	Sorghum/SG Silage	x		2	Spring/Summer/Fall	1	Liquid	Pivot	N/A	A
			Forage Sorghum	x		2	Summer	1	Liquid	Pivot	N/A	A
			SG Silage	x		2	Fall/Spring	1	Liquid	Pivot	N/A	A
			Cotton	x		2	Summer/Fall	1	Liquid	Pivot	N/A	A
			SG Grazing	x		2	Fall/Spring	1	Liquid	Pivot	N/A	A
			Corn (Grain or Silage)	x		2	Spring/Summer	1	Liquid	Pivot	N/A	A
3B	Cotton	SG Silage	Sorghum/SG Silage	x		2	Spring/Summer/Fall	1	Liquid	Pivot	N/A	A
			Forage Sorghum	x		2	Summer	1	Liquid	Pivot	N/A	A
			SG Silage	x		2	Fall/Spring	1	Liquid	Pivot	N/A	A
			SG Grazing	x		2	Fall/Spring	1	Liquid	Pivot	N/A	A
			Corn (Grain or Silage)	x		2	Spring/Summer	1	Liquid	Pivot	N/A	A
4	Cotton	SG Silage	Sorghum/SG Silage	x		2	Spring/Summer/Fall	1	Solid	Spreader	Incorporated	A
			Forage Sorghum	x		2	Summer	1	Solid	Spreader	Incorporated	A
			SG Silage	x		2	Fall/Spring	1	Solid	Spreader	Incorporated	A
			SG Grazing	x		2	Fall/Spring	1	Solid	Spreader	Incorporated	A
			Corn (Grain or Silage)	x		2	Spring/Summer	1	Solid	Spreader	Incorporated	A

(a) Planned crop rotation.
(b) Alternative crops that may be planted.
(c) Assessment shall be conducted for each field to which manure, slurry or wastewater will or may be applied on an annual basis. Refer to the Phosphorus Risk Assessment Tool.

5.2 Nutrient Budgets

A nutrient budget for each field to which manure, wastewater or sludge/slurry will or may be applied for the period of the 5-year permit is represented on Tables 5.2. The table demonstrates compliance with the following specific permit terms:

1) The maximum amounts of nitrogen and phosphorus that will be derived from all sources of nutrients (pounds/acre for each crop and field);
2) the realistic annual yield goal for each crop or use identified for each field for each year, including any alternative crops identified;
3) the nitrogen and phosphorus recommendations from EPA approved sources for each crop or use identified for each field, including any alternative crops identified;
4) credits for all nitrogen in the field that will be plant-available;
5) the amount of nitrogen and phosphorus in the manure, litter, and process wastewater to be applied;
6) consideration of multi-year phosphorus application (for any field where nutrients are applied at a rate based on the crop phosphorus requirement, the methodology must account for single year nutrient applications that supply more than the crop's annual phosphorus requirement);
7) accounting for all other additions of plant available nitrogen and phosphorus to the field (i.e., from sources other than manure, litter, or process wastewater or credits for residual nitrogen);
8) volatilization of nitrogen and mineralization of organic nitrogen; and
9) any other factors necessary to determine the amounts of nitrogen and phosphorus to be applied in accordance with the Narrative Rate Approach.

EXECUTIVE SUMMARY

This plan recommends that wastewater be applied to LMU 1, 2, 3A & 3B with manure applied to 4 in a double crop scenario utilizing a warm season crop and small grains at the rates recommended. Currently, subsoil nutrients associated with all LMUs is high. Further applications of nutrients may be warranted once the soils have been reanalyzed in 2011.

Currently, the NMP is illustrating an application rate based on 1.5 x P requirements. However, it is recommended that application rates be held to 1.0 x P removal to ensure that soil test P levels do not increase significantly.

The producer does have access to acreages considered as offsite application areas that are currently owned/operated by other producers that may receive manure.

Primary crop rotations for this facility are wheat and corn for silage and cotton. Wheat crops may be utilized for grazing, silage and grain. These decisions will be made by the producer based upon climatic conditions and commodity prices.

Producer desires to have grazing options on all fields. Producer desires to graze all crops with all grazing options based upon commodity and climatic conditions. It is not uncommon for producers to utilize a light to moderate grazing scheme while utilizing the crops for haylage or grain production.

Although this plan illustrates specifics pertaining to the location of manure and wastewater applications, it is not the intent of this document to limit application of wastewater and manure to specified LMUs. It may be necessary to apply a mixture of source nutrients to other LMUs in addition to, or in place of, the recommended LMUs. Specifically, climatic conditions may necessitate manure and wastewater to be placed on other LMUs, or portions of, to ensure compliance with applicable rules. At no time should the maximum allowable application rates shown within the NMP be exceeded during the crop year. Application at or above the maximum rates may result in a buildup of nutrients within the soil profile and hamper further application activities during the following growing season(s).

Table 5.2
Oppliger South
Curry County NM
Nutrient Management Budgets
2011

			Column A	B	C	D	E		F	G	H	I	J	K	L	M
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-24" Soil N Residual lb/Ac (2)	0-6" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Source N content (4)	Source N Adjusted for availability (5)	Source amount to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Source P2O5 content (4)	PI Adjusted P2O5 (8)	End Of Year Soil ppm P (9)
Field 1	Corn Silage-SG Silage	20-25/8-10	445	139	187	200	258	Lagoon	81	55	4.0	2	0	52	209	230
Field 1	Small Grain Silage	8-10 T	134	43	187	200	-53	Lagoon	81	55	0.0	2	0	52	0	181
Field 1	Forage Sorghum	10-15 T	240	83	187	200	53	Lagoon	81	55	1.0	2	0	52	50	186
Field 1	Sorghum Silage-SG Silage	20-25/8-10	375	117	187	200	188	Lagoon	81	55	3.4	2	0	52	176	226
Field 1	Cotton	3 bale	150	35	187	200	-37	Lagoon	81	55	0.0	2	0	52	0	185
Field 2	Corn Silage-SG Silage	20-25/8-10	445	139	193	250	252	Lagoon	81	55	4.0	2	0	52	209	280
Field 2	Small Grain Silage	8-10 T	134	43	193	250	-59	Lagoon	81	55	0.0	2	0	52	0	231
Field 2	Forage Sorghum	10-15 T	240	83	193	250	47	Lagoon	81	55	0.9	2	0	52	44	233
Field 2	Sorghum Silage-SG Silage	20-25/8-10	375	117	193	250	182	Lagoon	81	55	3.3	2	0	52	172	274
Field 2	Cotton	3 bale	150	35	193	250	-43	Lagoon	81	55	0.0	2	0	52	0	235
Field 3A	Corn Silage-SG Silage	20-25/8-10	445	139	202	259	243	Lagoon	81	55	4.4	2	0	25	110	246
Field 3A	Small Grain Silage	8-10 T	134	43	202	259	-68	Lagoon	81	55	0.0	2	0	25	0	240
Field 3A	Forage Sorghum	10-15 T	240	83	202	259	38	Lagoon	81	55	0.7	2	0	25	17	230
Field 3A	Sorghum Silage-SG Silage	20-25/8-10	375	117	202	259	173	Lagoon	81	55	3.1	2	0	25	79	242
Field 3A	Cotton	3 bale	150	35	202	259	-52	Lagoon	81	55	0.0	2	0	25	0	244
Field 3B	Corn Silage-SG Silage	20-25/8-10	445	139	464	266	-19	Lagoon	81	55	0.0	2	0	52	0	205
Field 3B	Small Grain Silage	8-10 T	134	43	464	266	-330	Lagoon	81	55	0.0	2	0	52	0	247
Field 3B	Forage Sorghum	10-15 T	240	83	464	266	-224	Lagoon	81	55	0.0	2	0	52	0	230
Field 3B	Sorghum Silage-SG Silage	20-25/8-10	375	117	464	266	-89	Lagoon	81	55	0.0	2	0	52	0	215
Field 3B	Cotton	3 bale	150	35	464	266	-314	Lagoon	81	55	0.0	2	0	52	0	251
Field 4	Corn Silage-SG Silage	20-25/8-10	445	139	245	137	200	Stockpile	46	27	7.5	2	0	25	187	158
Field 4	Small Grain Silage	8-10 T	134	43	245	137	-111	Stockpile	46	27	0.0	2	0	25	0	118
Field 4	Forage Sorghum	10-15 T	240	83	245	137	-5	Stockpile	46	27	0.0	2	0	25	0	101
Field 4	Sorghum Silage-SG Silage	20-25/8-10	375	117	245	137	130	Stockpile	46	27	4.8	2	0	25	121	139
Field 4	Cotton	3 bale	150	35	245	137	-95	Stockpile	46	27	0.0	2	0	25	0	122

Notes:
(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and east NM.
(2) Taken from annual soil tests results.
(3) Column A-Column C-Column J = Remainder Crop N Required to be supplied by organic source. Negative value indicates residual is higher than requirement. No waste application planned.
(4) Wastewater values from site specific analysis.
(5) Availability of N is estimated utilizing the USDA Ag Waste Management Handbook, Chapter 11. Wastewater Available N = (Organic * 49%) + (Ammonia * 75%); Manure Available N = (Organic * 53%) + (Ammonia * 75%)
(6) The amount of waste (ac-in for effluent and ton/ac for manure) to apply based on analysis of crop requirement, PI requirements, soil residuals.
(7) Calculated using the New Mexico Site Assessment Index-Phosphorus (1=Very Low, Low, Medium (N rate), 2=High (1.5 P removal), 3=Very High (P removal or less), 4=Excessive (no application))
(8) If P loss risk is 1 then application rate is at the N rate. If the remainder of crop N Required is less than zero, then no application is proposed. If P loss risk is greater than 1 then rates are according to PI rating class.
(9) Projected end of year ppm P based on the application rates established in this spreadsheet.

Table 5.2
Oppliger South
Curry County NM
Nutrient Management Budgets
2012

			Column A	B	C	D	E		F	G	H	I	J	K	L	M
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-24" Soil N Residual lb/Ac (2)	0-6" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Source N content (4)	Source N Adjusted for availability (5)	Source amount to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Source P2O5 content (4)	PI Adjusted P2O5 (8)	End Of Year Soil ppm P (9)
Field 1	Corn Silage-SG Silage	20-25/8-10	445	139	50	204	395	Lagoon	81	55	4.0	2	0	52	209	235
Field 1	Small Grain Silage	8-10 T	134	43	53	181	81	Lagoon	81	55	1.2	2	0	52	65	191
Field 1	Forage Sorghum	10-15 T	240	83	50	186	190	Lagoon	81	55	2.4	2	0	52	125	204
Field 1	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	214	325	Lagoon	81	55	3.4	2	0	52	176	240
Field 1	Cotton	3 bale	150	35	37	185	113	Lagoon	81	55	1.0	2	0	52	53	192
Field 2	Corn Silage-SG Silage	20-25/8-10	445	139	50	252	395	Lagoon	81	55	4.0	2	0	52	209	282
Field 2	Small Grain Silage	8-10 T	134	43	59	231	75	Lagoon	81	55	1.2	2	0	52	65	241
Field 2	Forage Sorghum	10-15 T	240	83	50	233	190	Lagoon	81	55	2.4	2	0	52	125	251
Field 2	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	264	325	Lagoon	81	55	3.4	2	0	52	176	289
Field 2	Cotton	20/8	150	35	43	235	107	Lagoon	81	55	1.0	2	0	52	53	242
Field 3A	Corn Silage-SG Silage	20-25/8-10	445	139	50	229	395	Lagoon	81	55	4.0	2	0	52	209	259
Field 3A	Small Grain Silage	8-10 T	134	43	68	240	66	Lagoon	81	55	1.2	2	0	52	62	249
Field 3A	Forage Sorghum	10-15 T	240	83	50	230	190	Lagoon	81	55	2.4	2	0	52	125	248
Field 3A	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	237	325	Lagoon	81	55	3.4	2	0	52	176	263
Field 3A	Cotton	3 bale	150	35	52	244	98	Lagoon	81	55	1.0	2	0	52	53	251
Field 3B	Corn Silage-SG Silage	20-25/8-10	445	139	19	205	426	Lagoon	81	55	4.0	2	0	52	209	236
Field 3B	Small Grain Silage	8-10 T	134	43	330	247	-196	Lagoon	81	55	0.0	2	0	52	0	228
Field 3B	Forage Sorghum	10-15 T	240	83	224	230	16	Lagoon	81	55	0.3	2	0	52	15	200
Field 3B	Sorghum Silage-SG Silage	20-25/8-10	375	117	89	215	286	Lagoon	81	55	3.4	2	0	52	176	240
Field 3B	Cotton	3 bale	150	35	314	251	-164	Lagoon	81	55	0.0	2	0	52	0	235
Field 4	Corn Silage-SG Silage	20-25/8-10	445	139	50	140	395	Stockpile	46	27	8.3	2	0	25	209	170
Field 4	Small Grain Silage	8-10 T	134	43	111	118	23	Stockpile	46	27	0.9	2	0	25	21	109
Field 4	Forage Sorghum	10-15 T	240	83	5	101	235	Stockpile	46	27	5.0	2	0	25	125	119
Field 4	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	139	325	Stockpile	46	27	7.0	2	0	25	176	164
Field 4	Cotton	3 bale	150	35	95	122	55	Stockpile	46	27	2.0	2	0	25	51	129

Notes:
(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and east NM.
(2) Taken from annual soil tests results.
(3) Column A-Column C-Column J = Remainder Crop N Required to be supplied by organic source. Negative value indicates residual is higher than requirement. No waste application planned.
(4) Wastewater values from site specific analysis.
(5) Availability of N is estimated utilizing the USDA Ag Waste Management Handbook, Chapter 11. Wastewater Available N = (Organic * 49%) + (Ammonia * 75%); Manure Available N = (Organic * 53%) + (Ammonia * 75%)
(6) The amount of waste (ac-in for effluent and ton/ac for manure) to apply based on analysis of crop requirement, PI requirements, soil residuals.
(7) Calculated using the New Mexico Site Assessment Index-Phosphorus (1=Very Low, Low, Medium (N rate), 2=High (1.5 P removal), 3=Very High (P removal or less), 4=Excessive (no application))
(8) If P loss risk is 1 then application rate is at the N rate. If the remainder of crop N Required is less than zero, then no application is proposed. If P loss risk is greater than 1 then rates are according to PI rating class.
(9) Projected end of year ppm P based on the application rates established in this spreadsheet.

Table 5.2
Oppliger South
Curry County NM
Nutrient Management Budgets
2013

			Column A	B	C	D	E		F	G	H	I	J	K	L	M
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-24" Soil N Residual lb/Ac (2)	0-6" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Source N content (4)	Source N Adjusted for availability (5)	Source amount to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Source P2O5 content (4)	PI Adjusted P2O5 (8)	End Of Year Soil ppm P (9)
Field 1	Corn Silage-SG Silage	20-25/8-10	445	139	50	235	395	Lagoon	81	55	4.0	2	0	52	209	265
Field 1	Small Grain Silage	8-10 T	134	43	50	191	84	Lagoon	81	55	1.2	2	0	52	65	200
Field 1	Forage Sorghum	10-15 T	240	83	50	204	190	Lagoon	81	55	2.4	2	0	52	125	222
Field 1	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	240	325	Lagoon	81	55	3.4	2	0	52	176	265
Field 1	Cotton	3 bale	150	35	50	192	100	Lagoon	81	55	1.0	2	0	52	53	200
Field 2	Corn Silage-SG Silage	20-25/8-10	445	139	50	282	395	Lagoon	81	55	4.0	2	0	52	209	313
Field 2	Small Grain Silage	8-10 T	134	43	50	241	84	Lagoon	81	55	1.2	2	0	52	65	250
Field 2	Forage Sorghum	10-15 T	240	83	50	251	190	Lagoon	81	55	2.4	2	0	52	125	269
Field 2	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	289	325	Lagoon	81	55	3.4	2	0	52	176	315
Field 2	Cotton	3 bale	150	35	50	109	100	Lagoon	81	55	1.0	2	0	52	53	116
Field 3A	Corn Silage-SG Silage	20-25/8-10	445	139	50	259	395	Lagoon	81	55	4.0	2	0	52	209	289
Field 3A	Small Grain Silage	8-10 T	134	43	50	240	84	Lagoon	81	55	1.2	2	0	52	65	250
Field 3A	Forage Sorghum	10-15 T	240	83	50	230	190	Lagoon	81	55	2.4	2	0	52	125	248
Field 3A	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	237	325	Lagoon	81	55	3.4	2	0	52	176	263
Field 3A	Cotton	3 bale	150	35	50	244	100	Lagoon	81	55	1.0	2	0	52	53	251
Field 3B	Corn Silage-SG Silage	20-25/8-10	445	139	50	205	395	Lagoon	81	55	4.0	2	0	52	209	236
Field 3B	Small Grain Silage	8-10 T	134	43	50	247	84	Lagoon	81	55	1.2	2	0	52	65	257
Field 3B	Forage Sorghum	10-15 T	240	83	50	230	190	Lagoon	81	55	2.4	2	0	52	125	248
Field 3B	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	215	325	Lagoon	81	55	3.4	2	0	52	176	240
Field 3B	Cotton	3 bale	150	35	50	251	100	Lagoon	81	55	1.0	2	0	52	53	258
Field 4	Corn Silage-SG Silage	20-25/8-10	445	139	50	140	395	Stockpile	46	27	8.3	2	0	25	209	170
Field 4	Small Grain Silage	8-10 T	134	43	50	118	84	Stockpile	46	27	2.6	2	0	25	65	128
Field 4	Forage Sorghum	10-15 T	240	83	50	101	190	Stockpile	46	27	5.0	2	0	25	125	119
Field 4	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	139	325	Stockpile	46	27	7.0	2	0	25	176	164
Field 4	Cotton	3 bale	150	35	50	122	100	Stockpile	46	27	2.1	2	0	25	53	129

Notes:
(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and east NM.
(2) Taken from annual soil tests results.
(3) Column A-Column C-Column J = Remainder Crop N Required to be supplied by organic source. Negative value indicates residual is higher than requirement. No waste application planned.
(4) Wastewater values from site specific analysis.
(5) Availability of N is estimated utilizing the USDA Ag Waste Management Handbook, Chapter 11. Wastewater Available N = (Organic * 49%) + (Ammonia * 75%); Manure Available N = (Organic * 53%) + (Ammonia * 75%)
(6) The amount of waste (ac-in for effluent and ton/ac for manure) to apply based on analysis of crop requirement, PI requirements, soil residuals.
(7) Calculated using the New Mexico Site Assessment Index-Phosphorus (1=Very Low, Low, Medium (N rate), 2=High (1.5 P removal), 3=Very High (P removal or less), 4=Excessive (no application))
(8) If P loss risk is 1 then application rate is at the N rate. If the remainder of crop N Required is less than zero, then no application is proposed. If P loss risk is greater than 1 then rates are according to PI rating class.
(9) Projected end of year ppm P based on the application rates established in this spreadsheet.

Table 5.2
Oppliger South
Curry County NM
Nutrient Management Budgets
2014

			Column A	B	C	D	E		F	G	H	I	J	K	L	M
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-24" Soil N Residual lb/Ac (2)	0-6" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Source N content (4)	Source N Adjusted for availability (5)	Source amount to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Source P2O5 content (4)	PI Adjusted P2O5 (8)	End Of Year Soil ppm P (9)
Field 1	Corn Silage-SG Silage	20-25/8-10	445	139	50	265	395	Lagoon	81	55	4.0	2	0	52	209	295
Field 1	Small Grain Silage	8-10 T	134	43	50	200	84	Lagoon	81	55	1.2	2	0	52	65	209
Field 1	Forage Sorghum	10-15 T	240	83	50	222	190	Lagoon	81	55	2.4	2	0	52	125	240
Field 1	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	265	325	Lagoon	81	55	3.4	2	0	52	176	291
Field 1	Cotton	3 bale	150	35	50	200	100	Lagoon	81	55	1.0	2	0	52	53	208
Field 2	Corn Silage-SG Silage	20-25/8-10	445	139	50	313	395	Lagoon	81	55	4.0	2	0	52	209	343
Field 2	Small Grain Silage	8-10 T	134	43	50	250	84	Lagoon	81	55	1.2	2	0	52	65	259
Field 2	Forage Sorghum	10-15 T	240	83	50	269	190	Lagoon	81	55	2.4	2	0	52	125	287
Field 2	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	315	325	Lagoon	81	55	3.4	2	0	52	176	340
Field 2	Cotton	3 bale	150	35	50	248	100	Lagoon	81	55	1.0	2	0	52	53	256
Field 3A	Corn Silage-SG Silage	20-25/8-10	445	139	50	289	395	Lagoon	81	55	4.0	2	0	52	209	320
Field 3A	Small Grain Silage	8-10 T	134	43	50	250	84	Lagoon	81	55	1.2	2	0	52	65	259
Field 3A	Forage Sorghum	10-15 T	240	83	50	248	190	Lagoon	81	55	2.4	2	0	52	125	267
Field 3A	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	263	325	Lagoon	81	55	3.4	2	0	52	176	288
Field 3A	Cotton	3 bale	150	35	50	240	100	Lagoon	81	55	1.0	2	0	52	53	248
Field 3B	Corn Silage-SG Silage	20-25/8-10	445	139	50	236	395	Lagoon	81	55	4.0	2	0	52	209	266
Field 3B	Small Grain Silage	8-10 T	134	43	50	257	84	Lagoon	81	55	1.2	2	0	52	65	266
Field 3B	Forage Sorghum	10-15 T	240	83	50	248	190	Lagoon	81	55	2.4	2	0	52	125	266
Field 3B	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	240	325	Lagoon	81	55	3.4	2	0	52	176	266
Field 3B	Cotton	3 bale	150	35	50	164	100	Lagoon	81	55	1.0	2	0	52	53	172
Field 4	Corn Silage-SG Silage	20-25/8-10	445	139	50	170	395	Stockpile	46	27	8.3	2	0	25	209	200
Field 4	Small Grain Silage	8-10 T	134	43	50	128	84	Stockpile	46	27	2.6	2	0	25	65	137
Field 4	Forage Sorghum	10-15 T	240	83	50	119	190	Stockpile	46	27	5.0	2	0	25	125	137
Field 4	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	164	325	Stockpile	46	27	7.0	2	0	25	176	190
Field 4	Cotton	3 bale	150	35	50	129	100	Stockpile	46	27	2.1	2	0	25	53	137

Notes:
(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and east NM.
(2) Taken from annual soil tests results.
(3) Column A-Column C-Column J = Remainder Crop N Required to be supplied by organic source. Negative value indicates residual is higher than requirement. No waste application planned.
(4) Wastewater values from site specific analysis.
(5) Availability of N is estimated utilizing the USDA Ag Waste Management Handbook, Chapter 11. Wastewater Available N = (Organic * 49%) + (Ammonia * 75%); Manure Available N = (Organic * 53%) + (Ammonia * 75%)
(6) The amount of waste (ac-in for effluent and ton/ac for manure) to apply based on analysis of crop requirement, PI requirements, soil residuals.
(7) Calculated using the New Mexico Site Assessment Index-Phosphorus (1=Very Low, Low, Medium (N rate), 2=High (1.5 P removal), 3=Very High (P removal or less), 4=Excessive (no application))
(8) If P loss risk is 1 then application rate is at the N rate. If the remainder of crop N Required is less than zero, then no application is proposed. If P loss risk is greater than 1 then rates are according to PI rating class.
(9) Projected end of year ppm P based on the application rates established in this spreadsheet.

Table 5.2
Oppliger South
Curry County NM
Nutrient Management Budgets
2015

			Column A	B	C	D	E		F	G	H	I	J	K	L	M
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-24" Soil N Residual lb/Ac (2)	0-6" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Source N content (4)	Source N Adjusted for availability (5)	Source amount to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Source P2O5 content (4)	PI Adjusted P2O5 (8)	End Of Year Soil ppm P (9)
Field 1	Corn Silage-SG Silage	20-25/8-10	445	139	50	295	395	Lagoon	81	55	4.0	2	0	52	209	326
Field 1	Small Grain Silage	8-10 T	134	43	50	209	84	Lagoon	81	55	1.2	2	0	52	65	219
Field 1	Forage Sorghum	10-15 T	240	83	50	240	190	Lagoon	81	55	2.4	2	0	52	125	258
Field 1	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	291	325	Lagoon	81	55	3.4	2	0	52	176	316
Field 1	Cotton	3 bale	150	35	50	208	100	Lagoon	81	55	1.0	2	0	52	53	215
Field 2	Corn Silage-SG Silage	20-25/8-10	445	139	50	343	395	Lagoon	81	55	4.0	2	0	52	209	373
Field 2	Small Grain Silage	8-10 T	134	43	50	259	84	Lagoon	81	55	1.2	2	0	52	65	269
Field 2	Forage Sorghum	10-15 T	240	83	50	287	190	Lagoon	81	55	2.4	2	0	52	125	306
Field 2	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	340	325	Lagoon	81	55	3.4	2	0	52	176	366
Field 2	Cotton	3 bale	150	35	50	256	100	Lagoon	81	55	1.0	2	0	52	53	264
Field 3A	Corn Silage-SG Silage	20-25/8-10	445	139	50	320	395	Lagoon	81	55	4.0	2	0	52	209	350
Field 3A	Small Grain Silage	8-10 T	134	43	50	259	84	Lagoon	81	55	1.2	2	0	52	65	268
Field 3A	Forage Sorghum	10-15 T	240	83	50	267	190	Lagoon	81	55	2.4	2	0	52	125	285
Field 3A	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	288	325	Lagoon	81	55	3.4	2	0	52	176	314
Field 3A	Cotton	3 bale	150	35	50	248	100	Lagoon	81	55	1.0	2	0	52	53	256
Field 3B	Corn Silage-SG Silage	20-25/8-10	445	139	50	266	395	Lagoon	81	55	4.0	2	0	52	209	296
Field 3B	Small Grain Silage	8-10 T	134	43	50	266	84	Lagoon	81	55	1.2	2	0	52	65	275
Field 3B	Forage Sorghum	10-15 T	240	83	50	266	190	Lagoon	81	55	2.4	2	0	52	125	284
Field 3B	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	266	325	Lagoon	81	55	3.4	2	0	52	176	292
Field 3B	Cotton	3 bale	150	35	50	172	100	Lagoon	81	55	1.0	2	0	52	53	179
Field 4	Corn Silage-SG Silage	20-25/8-10	445	139	50	200	395	Stockpile	46	27	8.3	2	0	25	209	231
Field 4	Small Grain Silage	8-10 T	134	43	50	137	84	Stockpile	46	27	2.6	2	0	25	65	146
Field 4	Forage Sorghum	10-15 T	240	83	50	137	190	Stockpile	46	27	5.0	2	0	25	125	155
Field 4	Sorghum Silage-SG Silage	20-25/8-10	375	117	50	190	325	Stockpile	46	27	7.0	2	0	25	176	215
Field 4	Cotton	3 bale	150	35	50	137	100	Stockpile	46	27	2.1	2	0	25	53	145

Notes:
(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and east NM.
(2) Taken from annual soil tests results.
(3) Column A-Column C-Column J = Remainder Crop N Required to be supplied by organic source. Negative value indicates residual is higher than requirement. No waste application planned.
(4) Wastewater values from site specific analysis.
(5) Availability of N is estimated utilizing the USDA Ag Waste Management Handbook, Chapter 11. Wastewater Available N = (Organic * 49%) + (Ammonia * 75%); Manure Available N = (Organic * 53%) + (Ammonia * 75%)
(6) The amount of waste (ac-in for effluent and ton/ac for manure) to apply based on analysis of crop requirement, PI requirements, soil residuals.
(7) Calculated using the New Mexico Site Assessment Index-Phosphorus (1=Very Low, Low, Medium (N rate), 2=High (1.5 P removal), 3=Very High (P removal or less), 4=Excessive (no application))
(8) If P loss risk is 1 then application rate is at the N rate. If the remainder of crop N Required is less than zero, then no application is proposed. If P loss risk is greater than 1 then rates are according to PI rating class.
(9) Projected end of year ppm P based on the application rates established in this spreadsheet.

5.3 Methodology

The methodology including formulas, sources of data and protocols for making determinations. Tables 5.3 and 5.4 are example budgets that provide a methodology for the narrative approach to calculating nitrogen or phosphorus based application rates.

Table 5.3: Wastewater Application Calculations

	Application Calculations (LMU 1 for example)	Rate
1	Determine nutrient component from soil (lbs-N/ac or lbs-P2O5): **Nitrogen = (lbs./ac-in from both 0-6 and 6-24 soil profiles shown on soil test)** **Phosphorus = (lbs./ac-in from the 0-6 soil profile shown on soil test)**	**N = 187** **P = 200 ppm (916 lb/Ac)**
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement = (from Planning Tools – S-Crops)** **For Phosphorus – Adjust for Phosphorus Index (PI). (refer to PI Sheets)**	**445 lb/Ac N** **209 lb/Ac P2O5**
3	Determine remaining nutrients needed for crop requirement, (lbs-N/ac or lbs-P2O5) **= (Line 2 -Line 1)**	**N = 258** **P = 0**
4	Determine nutrient concentration from effluent (lbs-N/ac-in) **Nitrogen = (lbs./ac-in value from effluent test)** **Phosphorus = (lbs./ac-in P2O5 value from effluent test)**	**N = 81** **P2O5 = 52**
5	Effluent Adjustment: Determine nutrient concentration assuming an estimated % available each year. **% Available N = ((Organic * 49%) + (Ammonia N * 75%))/TN; TN per ac-in * % available = adjusted** **Phosphorus = (lbs./ac-in of P2O5 in value from effluent test) @ 100% available**	**N = 55** **P2O5 = 52**
6	Enter acreage to be irrigated, (acres)	**120**
7	Determine volume of effluent needed to meet crop requirement, (ac-ft)* **=(Line 3 / Line 5) / 12**	**0.33**
8	Conversion to total gallons **=(Line 7 x 325,851)**	**109,139**
9	Conversion to acre-inches per acre **=(Line 3/ Line 5)**	**4.0**

Table 5.4: Manure (Solids) Application Calculations

	Application Calculations (Example)	Rate
1	Determine nutrient component from soil (lbs-N/ac or lbs-P2O5): **Nitrogen = (lbs./ac-in from both 0-6 and 6-24 soil profiles shown on soil test)** **Phosphorus = (lbs./ac-in from the 0-6 soil profile shown on soil test)**	**N = 245** **P = 137 ppm (628 lb/Ac)**
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement = (from Planning Tools – S-Crops)** **For Phosphorus – Adjust for Phosphorus Index (PI). (refer to PI Sheets)**	**445 lb/Ac N** **209 lb/Ac P2O5**
3	Determine remaining nutrients needed for crop requirement, (lbs-N/ac) **= (Line 2 -Line 1)**	**N = 200** **P = 0**
4	Determine nutrient component from solid manure (lbs-N/ton) **Nitrogen = (lbs./ton value from manure test)** **Phosphorus = (lbs./ton P2O5 value from manure test)**	**N=46 lb/T** **P2O5=25.2 lb/T**
5	Assume 50% of nitrogen available in first year **% Available N = ((Organic * 53%) + (Ammonia N * 75%))/TN; TN per ac-in * % available = adjusted** **Phosphorus = (lbs./ac-in of P2O5 in value from effluent test) @ 100% available**	**N=27 lb/T** **P2O5=25.2 lb/T**
6	Total nitrogen available in first year, (lbs-N/ton) = **(Result from Line 5)**	**N=27 lb/T** **P2O5=25.2 lb/T**
7	Enter the amount of solid manure to be applied, (tons) = **(Line 2 / Line 5)**	**7.5 T/Ac**
8	Number of acres the manure will be applied to, (acres)	**120**
9	Total to be applied, (tons) = **(Line 7 x Line 8)**	**900 tons**

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	Oppliger South	Field(s):	1	Date:	3/5/2011
Planner:	EAE	Location:	Clovis NM	Crop:	Corn/wht
Soil Permeability (in/hr):	2	Slope (%):	1.6	Planned/Exist.:	

Site Characteristic	Place an X in the approprate 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					0
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					0
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			1
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
					X	12

P Hazard Class: High **Total Index Points:** 31.0

Phosphorus Application Classification: P Based (at 1.5 X crop removal)

Notes:

This evaluation has a High P hazard class and the nutrient application will be based on 1.5 times the P crop uptake.

Comments:

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	Oppliger South	Field(s):	2	Date:	3/5/2011
Planner:	EAE	Location:	Clovis NM	Crop:	Corn/wht
Soil Permeablity (in/hr):	2	Slope (%):	1.6	Planned/Exist.:	

Site Characteristic	Place an X in the approprate 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					0
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					0
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			1
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
					X	12

P Hazard Class:	High	Total Index Points:	31.0
Phosphorus Application Classification:	P Based (at 1.5 X crop removal)		

Notes:

This evaluation has a High P hazard class and the nutrient application will be based on 1.5 times the P crop uptake.

Comments:

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	Oppliger South	Field(s):	3a	Date:	3/2/2011
Planner:	EAE	Location:	Clovis NM	Crop:	Cotton/Wht
Soil Permeablity (in/hr):	2	Slope (%):	1.2	Planned/Exist.:	

Site Characteristic	Place an X in the approprate 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				1
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					0
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				1.5
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				0.5
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
					X	12

P Hazard Class: High **Total Index Points:** 31.0

Phosphorus Application Classification: P Based (at 1.5 X crop removal)

Notes:

This evaluation has a High P hazard class and the nutrient application will be based on 1.5 times the P crop uptake.

Comments:

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	Oppliger South	Field(s):	3b	Date:	3/5/2011
Planner:	EAE	Location:	Clovis NM	Crop:	Corn/wht
Soil Permeablity (in/hr):	2	Slope (%):	1.5	Planned/Exist.:	

Site Characteristic	Place an X in the approprate 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				1
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					0
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					0
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			1
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
					X	12

P Hazard Class:	High	Total Index Points:	30.0
Phosphorus Application Classification:	P Based (at 1.5 X crop removal)		

Notes:

This evaluation has a High P hazard class and the nutrient application will be based on 1.5 times the P crop uptake.

Comments:

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	Oppliger South	Field(s):	4	Date:	3/5/2011
Planner:	EAE	Location:	Clovis NM	Crop:	Corn/wht
Soil Permeablity (in/hr):	2	Slope (%):	1.6	Planned/Exist.:	

Site Characteristic	Place an X in the approprate 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					0
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					0
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			1
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
					X	12

P Hazard Class: High **Total Index Points:** 31.0

Phosphorus Application Classification: P Based (at 1.5 X crop removal)

Notes:

This evaluation has a High P hazard class and the nutrient application will be based on 1.5 times the P crop uptake.

Comments:

Last Revised - 8/31/09 - Downloaded from http://nmp.tamu.edu/ on 3/12/10.

Crop	Crop N requirement	Crop P2O5 requirement	lbs DM or air dried produced per year	% N (in column D value)	% P (in column D value)	% K (in column D value)		Crop N Removal Rate	Crop P_2O_5 Removal Rate
Corn 111 - 130 bu	144	105	7280	1.61%	0.28%	0.40%		117	47
Corn 131 - 150 bu	164	105	8400	1.61%	0.28%	0.40%		135	54
Corn 151 - 170 bu	180	130	9520	1.61%	0.28%	0.40%		153	61
Corn 171 - 190 bu	210	130	10604	1.61%	0.28%	0.40%		171	68
Corn 191 - 210 bu	250	130	11760	1.61%	0.28%	0.40%		189	75
Corn 211 - 230 bu	280	130	12880	1.61%	0.28%	0.40%		207	83
Corn 231 - 250 bu	300	130	14000	1.61%	0.28%	0.40%		225	90
Corn 250 - 275 bu	325	130	15120	1.61%	0.28%	0.40%		243	97
Corn 276 - 300 bu	350	130	16240	1.61%	0.28%	0.40%		261	104
Corn 301 - 350 bu	375	130	17360	1.61%	0.28%	0.40%		279	111
Corn 50 - 70 bu	70	80	3920	1.61%	0.28%	0.40%		63	25
Corn 71 - 90 bu	90	80	5040	1.61%	0.28%	0.40%		81	32
Corn 91 - 110 bu	120	105	6160	1.61%	0.28%	0.40%		99	39
Grain Sorg. 1000 #	20	30	1000	1.67%	0.36%	0.42%		17	8
Grain Sorg. 10000 #	200	130	10000	1.67%	0.36%	0.42%		167	82
Grain Sorg. 1500 #	30	30	1500	1.67%	0.36%	0.42%		25	12
Grain Sorg. 2000 #	40	30	2000	1.67%	0.36%	0.42%		33	16
Grain Sorg. 3000 #	60	55	3000	1.67%	0.36%	0.42%		50	25
Grain Sorg. 4000 #	80	55	4000	1.67%	0.36%	0.42%		67	33
Grain Sorg. 5000 #	100	80	5000	1.67%	0.36%	0.42%		84	41
Grain Sorg. 6000 #	120	80	6000	1.67%	0.36%	0.42%		100	49
Grain Sorg. 7000 #	140	130	7000	1.67%	0.36%	0.42%		117	58
Grain Sorg. 8000 #	160	130	8000	1.67%	0.36%	0.42%		134	66
Grain Sorg. 9000 #	180	130	9000	1.67%	0.36%	0.42%		150	74
Grain Sorg. 2000#; SG Moderate Graze	200	135	7800	1.66%	0.30%	1.82%		129	54
Grain Sorg. 3000#; SG Moderate Graze	220	160	8800	1.67%	0.31%	1.82%		147	62
Grain Sorg. 4000#; SG Moderate Graze	240	165	9800	1.67%	0.31%	1.82%		164	70
Grain Sorg. 5000#; SG Moderate Graze	260	185	10800	1.67%	0.32%	1.82%		180	79
Grain Sorg. 6000#; SG Moderate Graze	280	185	11800	1.67%	0.32%	1.82%		197	86
SG Silage(35% DM) 12 to 14 tons	160	90	9800	1.31%	0.30%	0.94%	Stephenville published values 1997-98	128	67
SG Silage(35% DM) 10 to 11 tons	120	70	7700	1.31%	0.30%	0.94%	Stephenville published values 1997-98	101	53
SG Silage(35% DM) 8 to 9 tons	95	40	6300	1.31%	0.30%	0.94%	Stephenville published values 1997-98	83	43
SG Silage(35% DM) 5 to 7 tons	70	30	4900	1.31%	0.30%	0.94%	Stephenville published values 1997-98	64	34
Silage - Corn(35% DM) 11 - 15 Ton	140	80	10500	1.13%	0.24%	1.09%	Stephenville published values 1997-98	119	58
Silage - Corn(35% DM) 16 - 20 Ton	240	100	14000	1.31%	0.24%	1.09%	Stephenville published values 1997-98	183	77
Silage - Corn(35% DM) 21 - 25 Ton	350	105	17500	1.50%	0.24%	1.09%	Stephenville published values 1997-98	263	96
Silage - Corn(35% DM) 26 - 30 Ton	420	135	21000	1.50%	0.24%	1.09%	Stephenville published values 1997-98	315	115
Silage - Corn(35% DM) 7 - 10 Ton	85	60	7000	1.13%	0.24%	1.09%	Stephenville published values 1997-98	79	38

Silage - Corn16-20T;SG GreenChop-6-7T	440	180	17500	1.95%	0.33%	1.02%	see above	341	132
Silage - Corn16-20T;SG GreenChop-8-9T	500	190	18500	2.09%	0.35%	1.02%	see above	387	148
Silage - Corn21-25T;SG GreenChop-6-7T	550	185	21000	2.00%	0.32%	1.02%	see above	420	154
Silage - Corn21-25T;SG GreenChop-8-9T	610	195	22000	2.10%	0.33%	1.02%	see above	462	166
Silage - Corn16-20T;SG Silage-5-7T	310	140	18900	1.30%	0.25%	1.02%	see above	246	108
Silage - Corn16-20T;SG Silage-8-9T	335	150	20800	1.30%	0.25%	1.02%	see above	270	119
Silage - Corn21-25T;SG Silage-5-7T	420	145	19300	1.70%	0.29%	1.02%	see above	328	128
Silage - Corn21-25T;SG Silage-8-9T	445	155	23800	1.45%	0.25%	1.02%	see above	345	136
Silage - Sorg(35% DM) 11 - 15 Ton	200	75	10500	1.70%	0.23%	1.02%	2003 Bushland values	179	55
Silage - Sorg(35% DM) 16 - 20 Ton	280	95	14000	1.70%	0.23%	1.02%	2003 Bushland values	238	74
Silage - Sorg(35% DM) 21 - 25 Ton	360	115	17500	1.70%	0.23%	1.02%	2003 Bushland values	298	92
Silage - Sorg(35% DM) 26 - 30 Ton	380	130	21000	1.50%	0.23%	1.02%	2003 Bushland values	315	111
Silage - Sorg(35% DM) 31 - 40 Ton	450	155	28000	1.30%	0.21%	1.02%	2003 Bushland values	364	135
Silage - Sorg(35% DM) 41 - 50 Ton	580	190	35000	1.30%	0.21%	1.02%	2003 Bushland values	455	168
Silage - Sorg(35% DM) 51 - 60 Ton	700	220	42000	1.31%	0.21%	1.02%		550	202
Silage - Sorg(35% DM) 7 - 10 Ton	125	60	7000	1.70%	0.23%	1.02%	2003 Bushland values	119	37
Silage - Sorg21-25T;SG Silage-12-14T	520	205	27300	1.56%	0.25%	1.02%	see above	426	156
Silage - Sorg26-30T;SG Silage-12-14T	540	220	30800	1.43%	0.25%	1.02%	see above	440	176
Silage - Sorg31-40T;SG Silage-12-14T	610	245	37800	1.30%	0.24%	1.02%	see above	491	208
Silage - Sorg41-50T;SG Silage-12-14T	740	280	44800	1.30%	0.23%	1.02%	see above	582	236
Silage - Sorg51-60T;SG Silage-12-14T	860	310	51800	1.31%	0.23%	1.02%	see above	679	273
Silage - Sorg21-25T;SG Silage-10-11T	480	185	25200	1.58%	0.25%	1.02%	see above	398	144
Silage - Sorg26-30T;SG Silage-10-11T	500	200	28700	1.45%	0.25%	1.02%	see above	416	164
Silage - Sorg31-40T;SG Silage-10-11T	570	225	35700	1.30%	0.23%	1.02%	see above	464	188
Silage - Sorg41-50T;SG Silage-10-11T	700	260	42700	1.30%	0.23%	1.02%	see above	555	225
Silage - Sorg51-60T;SG Silage-10-11T	820	290	49700	1.31%	0.23%	1.02%	see above	651	262
Small Grain Heavy Grazing	240	105	6700	1.67%	0.27%	1.42%		112	41
Small Grain Light Grazing	60	80	4500	1.67%	0.27%	1.42%		75	28
Small Grain Moderate Grazing	160	105	5800	1.67%	0.27%	1.42%		97	36
Sorg. - Sudan Hay/Graze 11000 #	240	105	11000	1.99%	0.33%	2.43%		219	83
Sorg. - Sudan Hay/Graze 11000 #, SG mod graze	400	210	16800	1.88%	0.31%	2.09%		316	119
Sorg. - Sudan Hay/Graze 7500 #	160	55	7500	1.99%	0.33%	2.43%		149	57
Sorg. - Sudan Hay/Graze 7500 #, SG mod graze	320	160	13300	1.88%	0.31%	2.09%		250	94
Sorg Forage Hay/Graze 11000 #	240	105	11000	1.99%	0.33%	2.43%		219	83
Sorg Forage Hay/Graze 11000 #, SG mod graze	400	210	16800	1.88%	0.31%	2.09%		316	119
Sorg Forage Hay/Graze 7500 #	160	55	7600	1.99%	0.33%	2.43%		151	57
Sorg Forage Hay/Graze 7500 #, SG mod graze	320	160	13300	1.88%	0.31%	2.09%		250	94
Wheat Forage 4000 #	160	105	4000	1.67%	0.27%	1.42%		67	25
Wheat Forage 6000 #	240	105	6000	1.67%	0.27%	1.42%		100	37
Wheat Grain 20 - 30 bu + Grazing	60	55	2800	2.08%	0.62%	0.52%		58	40
Wheat Grain 20 - 30 bu	45	55	1800	2.08%	0.62%	0.52%		37	26
Wheat Grain 31 - 40 bu + Grazing	80	75	3400	2.08%	0.62%	0.52%		71	48
Wheat Grain 31 - 40 bu	60	75	2400	2.08%	0.62%	0.52%		50	34
Wheat Grain 41 - 50 bu + Grazing	100	75	4000	2.08%	0.62%	0.52%		83	57
Wheat Grain 41 - 50 bu	75	75	3000	2.08%	0.62%	0.52%		62	43
Wheat Grain 51 - 60 bu + Grazing	120	90	4600	2.08%	0.62%	0.52%		96	65
Wheat Grain 51 - 60 bu	90	90	3600	2.08%	0.62%	0.52%		75	51
Wheat Grain 61 - 70 bu + Grazing	140	90	5200	2.08%	0.62%	0.52%		108	74
Wheat Grain 61 - 70 bu	105	90	4200	2.08%	0.62%	0.52%		87	60
Wheat Grain 71 - 80 bu + Grazing	160	95	5800	2.08%	0.62%	0.52%		121	82
Wheat Grain 71 - 80 bu	120	95	4800	2.08%	0.62%	0.52%		100	68
Wheat Grain 81 - 90 bu + Grazing	180	95	6400	2.08%	0.62%	0.52%		133	91
Wheat Grain 81 - 90 bu	135	95	5400	2.08%	0.62%	0.52%		112	77
Wheat Grain 91 - 100 bu + Grazing	200	95	7000	2.08%	0.62%	0.52%		146	99
Wheat Grain 91 - 100 bu	150	95	6000	2.08%	0.62%	0.52%		125	85
Wheat Heavy Grazing	240	105	6800	1.67%	0.27%	1.42%		114	42
Wheat Light Grazing	60	80	4500	1.67%	0.27%	1.42%		75	28
Wheat Moderate Grazing	160	105	5800	1.67%	0.27%	1.42%		97	36
Cotton 1.0 Bale H	50	55	1333	2.67%	0.58%	0.83%		36	18
Cotton 1.0 Bale M	50	55	1333	2.67%	0.58%	0.83%		36	18
Cotton 1.0 Bale VH	50	55	1333	2.67%	0.58%	0.83%		36	18
Cotton 1.0 Bale VL - L	50	55	1333	2.67%	0.58%	0.83%	weight includes seed	36	18
Cotton 2.0 Bale H	100	105	2667	2.67%	0.58%	0.83%		71	35
Cotton 2.0 Bale M	100	105	2667	2.67%	0.58%	0.83%		71	35
Cotton 2.0 Bale VH	100	105	2667	2.67%	0.58%	0.83%		71	35
Cotton 2.0 Bale VL - L	100	105	2667	2.67%	0.58%	0.83%	weight includes seed	71	35
Cotton 3.0 Bale H	150	105	4000	2.67%	0.58%	0.83%		107	53
Cotton 3.0 Bale M	150	105	4000	2.67%	0.58%	0.83%		107	53
Cotton 3.0 Bale VH	150	105	4000	2.67%	0.58%	0.83%		107	53
Cotton 3.0 Bale VL - L	150	105	4000	2.67%	0.58%	0.83%	weight includes seed	107	53

SECTION 6 GENERAL INSPECTION, MONITOR, RECORD KEEPING AND REPORTING

6.1 General Inspection and Record Keeping

The permittee shall inspect, monitor, and record the results of such inspection and monitoring in accordance with Table 6.1:

Table 6.1: Record Keeping Required & Schedule

Parameter	Units	Frequency
Permit and Nutrient Management Plan		
The CAFO must maintain on-site a copy of the current NPDES permit, including the permit authorization notice.	N/A	Maintain at all times
The CAFO must maintain on-site a current site specific NMP that reflects existing operational characteristics. The operation must also maintain on-site all necessary records to document that the NMP is being properly implemented with respect to manure and wastewater generation, storage and handling, and land application. In addition records must be maintained that the development and implementation of the NMP is in accordance with the minimum practices defined in 40 CFR 122.42(e).	N/A	Maintain at all times
Soil and Manure/Wastewater Nutrient Analysis		
Analysis of manure, litter, and process wastewater to determine nitrogen and phosphorus content.[1]	ppm Pounds/ton	At least annually after initial sampling
Analysis of soil in all fields where land application activities are conducted to determine phosphorus content.[1]	ppm	At least once every 5 years after initial sampling
Operation and Maintenance		
Visual inspection of all water lines		Daily[2]
Documentation of depth of manure and process wastewater in all liquid impoundments	Feet	Weekly
Documentation of all corrective actions taken. Deficiencies not corrected within 30 days must be accompanied by an explanation of the factors preventing immediate correction.	N/A	As necessary
Documentation of animal mortality handling practices	N/A	As necessary
Design documentation for all manure, litter, and wastewater storage structures including the following information: • Volume for solids accumulation • Design treatment volume • Total design storage volume[3] • Days of storage capacity	N/A	Once in the permit term unless revised

Overflows/Discharges		
Date and time of overflow	Month/day/year	Per event
Estimated volume of overflow	Total gallons	Per event
Analysis of overflow (as required by the Permitting Authority)	ppm	Per event
Land Application		
Each application event where manure, litter, or process wastewater is applied, documentation of the following by field:		
Date of application	Month/day/year	Daily
Method of application	N/A	Daily
Weather conditions at the time of application and for 24 hours prior to and following application	N/A	Daily
Total amount of nitrogen and phosphorus applied[4]	Pounds/acre	Daily
Documentation of the crop and expected yield for each field	Bushel/acre	Seasonally
Documentation of the actual crop planted and actual yield for each field	N/A	As necessary
Documentation of test methods and sampling protocols used to sample and analyze manure, litter, and wastewater and soil.	N/A	Once in the permit term unless revised
Documentation of the basis for the application rates used for each field where manure, litter, or wastewater is applied.	N/A	Once in the permit term unless revised
Documentation showing the total nitrogen and phosphorus to be applied to each field including nutrients from the application of manure, litter, and wastewater and other sources	Pounds/acre	Once in the permit term unless revised
Documentation of manure application equipment inspection	N/A	Seasonally
Manure Transfer		
Date of transfer	N/A	As necessary
Name and address of recipient	N/A	As necessary
Approximate amount of manure, litter, or wastewater transferred	Tons/gallons	As necessary
Other		
Employee Training Employees responsible for permit compliance must be regularly trained or informed of any information pertinent to the proper operation and maintenance of the facility and waste disposal. Training shall include topics such as land application of wastes, proper operation and maintenance of the facility, good housekeeping and material management practices, necessary record-keeping requirements, and spill response and clean up.	N/A	The permittee is responsible for determining the appropriate training frequency for different levels of personnel and the NMP shall identify periodic dates for such training; however, employee training must occur at least once annually.
Liner Maintenance The permittee must maintain the liner to inhibit infiltration of wastewaters. Liners shall be protected from animals by fences or other		Within thirty (30) days of the damage

protective devices. No trees shall be allowed to grow within the potential distance of the root zone. Any mechanical or structural damage to the liner must be evaluated by a Professional Engineer within thirty (30) days of the damage. Documentation of liner maintenance shall be kept with the Nutrient Management Plan (NMP). The permittee shall have a Professional Engineer or qualified groundwater scientist review the documentation and do a site evaluation a minimum of once every five (5) years.		Minimum of once every five (5) years

[1] Refer to the state nutrient management technical standard for the specific analyses to be used.

[2] Visual inspections should take place daily during the course of normal operations. The completion of such inspection should be documented in a manner appropriate to the operation. Some operations may wish to maintain a daily log. Other operations may choose to make a weekly entry, then they update other weekly records, that required daily inspections have been completed.

[3] Total design volumes includes normal precipitation less evaporation on the surface of the structure for the storage period, normal runoff from the production area for the storage period, 25-year, 24-hour precipitation on the surface of the structure, 25-year, 24-hour runoff from the production area, and residual solids.

[4] Including quantity/volume of manure, litter, or process wastewater applied and the basis for the rate of phosphorus application.

6.2 Monitoring

6.2.1 Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report, or application.

6.2.2 Monitor Records

Records of monitoring information shall include:

- The date, exact place, and time of sampling or measurements;
- The individual(s) who performed the sampling or measurements;
- The date(s) analyses were performed;
- The individual(s) who performed the analyses;
- The analytical techniques or methods used; and
- The results of such analyses.

6.2.3 Monitor Procedures

The permittee shall follow the following monitoring procedures:

- Any required monitoring must be conducted according to test procedures approved in 40 CFR Part 136, unless other test procedures have been specified in this permit or approved by the Regional Administrator.
- The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate records of such activities.
- An adequate analytical quality control program (QA/QC), including the analyses of sufficient standards, spikes, and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory.

6.3 Reporting

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in § 122.29.

(b); or

The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under § 122.42(a) (1).

c. The alteration or addition results in a significant change in the permittee's manure use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit., including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to a NMP.

6.3.1 Annual Report

The annual report shall be submitted to EPA and NMED at the addresses listed below. *The annual report shall be submitted on the 31st day of January.*

Addresses for submitting required reports:

EPA Region 6: Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN-W)
U.S. EPA, Region 6
1445 Ross Ave.
Dallas, TX 75202-2733

NMED: Program Manager
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
1190 Saint Francis Drive
Santa Fe, NM 87502

2. The annual report must include the following information:

a. The number and type of animals, whether in open confinement or housed under roof;

b. Estimated amount of total manure, litter and process wastewater generated by the CAFO in the previous twelve (12) months (tons/gallons);

c. Estimated amount of total manure, litter and process wastewater transferred to other person by the CAFO in the previous twelve (12) months (tons/gallons);

d. Total number of acres for land application covered by the NMP:

e. Total number of acres under control of the CAFO that were used for land application of manure, litter and process wastewater in the previous twelve (12) months;

f. Summary of all manure, litter and process wastewater discharges from the production area that have occurred in the previous twelve (12) months, including date, time, and approximate volume; and

g. A statement indicating whether the current version of the CAFO's NMP was developed or approved by a certified nutrient management planner.

h. Actual crops planted and actual yields for each field for the preceding twelve (12) months.

i. Results of all samples of manure, litter or process wastewater for nitrogen and phosphorus content for manure, litter and process wastewater that was land applied.

j. Results of calculations conducted in accordance with Parts III.A.3.g.i (B) (for the Linear Approach) and III.A.3.g.ii (for the Narrative Rate Approach).

k. Amount of manure, litter, and process wastewater applied to each field during the preceding twelve (12) months.

l. For CAFOs using the Narrative Rate Approach to address rates of application:

i. The results of any soil testing for nitrogen and phosphorus conducted during the preceding twelve (12) months.

ii. The data used in calculations conducted in accordance with Part III.A.3.h.ii.

iii. The amount of any supplemental fertilizer applied during the preceding twelve (12) months.

SECTION 7 TESTING PROTOCOLS

7.1 Waste Sampling and Analysis Procedures

A representative wastewater, slurry and manure sample will be analyzed annually. Separate samples shall be taken from each manure storage site that represents a different animal type, size, age, diet, management practice, type of manure storage and handling, production period, or other factors that could affect nutrient values. The facility shall analyze according with Table 7.1:

Table 7.1: Waste Analysis Parameters

Parameter	Units	Liquid (Wastewater)	Solids (Sludge & Manure)
Total N (TKN or N)	%; lb	✓	✓
Total Phosphorus (P or P2O5)	%; lb	✓	✓
Total Potassium (K or K2O)	%; lb	✓	✓
Dry Matter or Moisture Content	%	✓	✓
pH		✓	

Recommended method(s) found in Manure Management Publications/Manure Characteristics: Section 1 Second Edition MWPS-18-S1; http://www.mwps.org/.

Other (describe):

_____

_____

7.2 Soil Sampling and Analysis Procedures

Fields shall be sampled according to the NMP (narrative approach). A representative wastewater, slurry and manure sample will be analyzed annually. The facility shall analyze according with Table 7.2:

Table 7.2: Soil Analysis Parameters

Method	Analyses
Saturation Extract (Saturation Extract)	pH
Saturation Extract (Saturation Extract)	Electrical Conductivity (EC)
-	Soil Organic Matter (OM)
-	Nitrate-Nitrogen (N)
Bray P-Test (soils with pH of <7) Olsen (Sodium Bicarbonate) (soils with pH of >7)	Phosphorus (P)
Water extraction or Ammonium acetate extractable K	Potassium (K)
Salinity Assessment	Magnesium (Mg)
Salinity Assessment	Calcium (Ca)

Salinity Assessment	Sodium (SAR)
-	Sulfates (S)

Samples shall be collected and prepared according to New Mexico State University (NMSU) Extension Guide A-114; http://aces.nmsu.edu/pubs/howto/howto.html. Soil test analysis shall be performed according to NMSU Extension Guide A-122.

Other (describe):

_____

_____

Test Your Soil

Guide A-114

Revised by C.R. Glover, Extension Agronomist and R.D. Baker, Area Extension Agronomist

Cooperative Extension Service
College of Agriculture and Home Economics

This publication is scheduled to be updated and reissued 4/05.

Soil tests provide a scientific basis for regulating available plant nutrients. Recommendations on kinds and amounts of fertilizer to apply and soil management practices are based on test results. Tests on a sample that does not accurately represent the area are likely to be misleading. The following directions can help you take a representative sample of the area you want tested.

Supplies

A soil auger, a soil tube, or a shovel and knife.

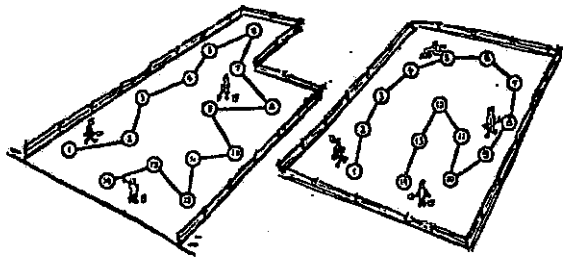
A clean bucket or other suitable container. Do not use a container made of metal.

A sample box and an information sheet, which you can get from your county agent or by writing to the Soil and Water Testing Laboratory, Box 3Q, New Mexico State University, Las Cruces, New Mexico 88003.

Where to Sample

Take a composite sample from each area or field, but as a rule, try to limit the sample area to no more than 40 acres. If you have large trouble spots or areas that differ extremely in appearance, slope, soil structure, productivity, drainage, or soil treatment, put a composite sample from each of these areas in separate sample boxes.

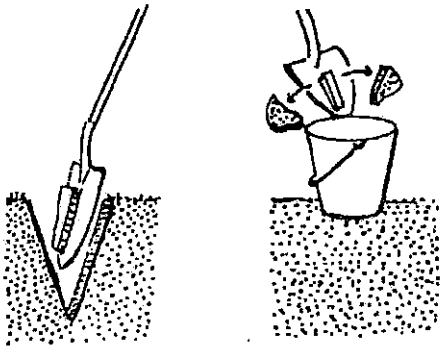
For a composite sample, take soil from at least five sites in a garden or lawn and up to 15 sites in a large field (as illustrated in the diagram). Avoid areas near a road, fence row, compost pile, fertilizer band, or other non-typical areas. *(Image not available. Please contact NMSU Agricultural Communications for a hard copy.)*



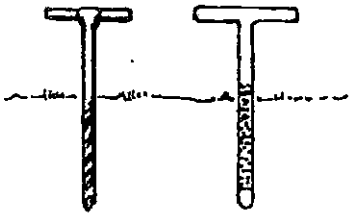
How to Sample

At each site remove any surface litter such as straw, leaves, and old stalks.

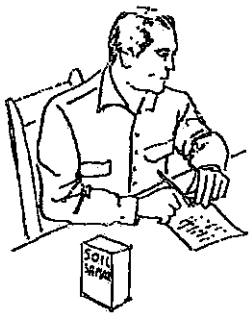
If you use a shovel and a knife, dig a hole about six inches deep. Take a slice of soil one-half inch thick and six inches deep and keep it on the shovel. From the center of this slice, cut a strip one-half inch wide from top to bottom and put it in the bucket. Repeat this at each site in the field.



If you use a soil auger or soil tube, take soil cores about six inches deep at each site and put in the bucket.



Mix the soil from all the sites in the same area. Place soil on a newspaper. Break any clods or lumps and let the sample dry at room temperature. Do not use heat for drying. Fill the sample box with the dry soil.



Label each sample with your name and a number keyed to a map of the area represented by each sample, so you will know where the sample was taken.

Complete the information sheet. Enclose it and the soil-testing fee in the package containing the soil sample so that all reach the laboratory together. If you send only one sample, place the information sheet and the soil-testing fee in the sample box with the soil.

The more information you can supply about the soil, the better the recommendations will be. Specify the crops that are to be grown. Fertilizer recommendations cannot be made if the crop to be grown is not specified.

Mailing the Sample

Take the soil sample box and the information sheet to your county agent, or mail them directly to the Soil and Water Testing Laboratory.

Note on Dying Plants

Grasses, vegetables, flowers, and other crops seldom die from lack of fertility. Water management, disease, and insects are some factors that can cause damage or death to plants. Check with your county agent, for *soil analysis is of little value in diagnosing these problems.*

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Revised April 2000

Las Cruces, NM
1.5M

Soil Test Interpretations

Cooperative Extension Service
College of Agriculture and Home Economics

Guide A-122

Esteban Herrera, Extension Horticulturist

This publication is scheduled to be updated and reissued 5/05.

A soil test can be an important management tool in developing an efficient soil fertility program, as well as monitoring a field for potential soil and water management problems. A soil test provides basic information on the nutrient supplying capacity of the soil. However, a test is not reliable if the soil sample is taken incorrectly or is improperly handled after collection. If you need help taking a soil sample properly, see your county Extension agent for publications on the proper soil sampling methods, and for a soil sampling kit.

Because analytical techniques vary among laboratories, the number values reported may vary from lab to lab. Numbers used by each have specific meanings for the laboratory. The interpretations discussed here are for the Soil, Plant and Water Testing Lab at New Mexico State University.

Fertilizer and soil management recommendations shown on the soil test report are based on the soil test and information provided on the information sheet which accompanies the soil sample to the lab. Items on the information sheet include cropping history, previous yields, fertilizer used, depth of soil and water table, water quality, and irrigation practices. Additional comments made on the information sheet can include general appearance of the crop, yield practices, or problems that may have a bearing on the crop. Fertilization requirements can vary with overall crop management program. Complete and accurate information is essential to get a fertilizer recommendation that will ensure the maximum yield for the least cost.

Individual Soil Tests

The following classifications are used for the standard soil test conducted by NMSU Soil, Plant and Water Testing Lab. Analyses for other factors are available upon request and require additional fees. Except for pH, the classifications are categorized as very low, low, moderate, high, and very high. For fertility factors (N, P, K, micronutrients) very low and low classifications indicate a high probability for obtaining a fertilizer response; moderate classifications indicate a fertilizer response may or may not occur; high and very high classifications indicate a fertilizer response is not likely to occur.

pH. Most crops will grow satisfactorily on soils with a pH ranging from 6.2 to 8.3. Crops susceptible to iron and zinc deficiencies may be affected at pH levels above 7.5.

Soils with a pH of 8.3 or higher usually have a high sodium content. Applications of sulfuric acid usually lower the pH for only a short period due to the high buffering capacity of the soils.

pH	*Classification*
> 8.5	strongly alkaline
7.9–8.5	moderately alkaline
7.3–7.9	slightly alkaline
6.7–7.3	neutral
6.2–6.7	slightly acid
5.6–6.2	moderately acid
3.0–5.6	strongly acid

Salts, Electrical Conductivity (E.C. x 10^3). When the electrical conductivity is less than 2, few salinity problems are evident. Problems may become evident in highly sensitive crops when the E.C. x 10^3 is from 2 to 4, although problems are usually minor. When the E.C. x 10^3 is from 4 to 8, problems usually are evident. When the E.C. x 10^3 is greater than 8, crops with moderate salt tolerance will usually show signs of reduced growth, foliage burn or chlorosis. Leaching can decrease the salinity hazard if soil permeability is adequate. Tables 1 and 2 list the salt tolerances of some crops and ornamental plants.

E.C. x 10^3	*Classification*
< 2	very low
2–4	low
4–8	moderate
8–16	high
> 16	very high

Table 1. Relative salt tolerance of selected crops, in order of decreasing tolerance within each group.

Good salt tolerance	Moderate salt tolerance	Poor salt tolerance
Field Crops		
barley (grain)	rye (grain)	vetch
sugar beet	wheat (grain)	
rape	oats (grain)	
cotton	alfalfa	
	sorghum (grain)	
	corn (grain)	
	foxtail millet	
	sunflower	
Forage Crops		
alkali sacaton	white sweetclover	white Dutch clover
saltgrass	yellow sweetclover	meadow foxtail
bermudagrass	perennial ryegrass	alsike clover
Canada wild rye	mountain bromegrass	red clover
western wheatgrass	barley (hay)	ladino clover
	birdsfoot trefoil	
	strawberry clover	
	dallisgrass	
	sudangrass	
	hubam clover	
	alfalfa	
	tall fescue	
	rye (hay)	
	wheat (hay)	
	oats (hay)	
Truck Crops		
garden beet	tomato	radish
kale	broccoli	spinach
asparagus	cabbage	celery
	cauliflower	green beans
	lettuce	
	potatoes (White Rose)	
	sweetcorn	
	carrot	
	peas	
	onion	
	squash	
	canteloupe	
	cucumber	
Fruit and Nut Crops		
pistachio	grape	pear
palm		apple
		prune
		plum
		apricot
		peach
		strawberry
		pecan

Table 2. Tolerance of selected ornamental plants to soil salinity.

Tolerance and range at which plants are affected	Ornamental plant
Extremely sensitive E.C. x 10^3 = <2	Southern yew
	Glossy abelia
	Photinia
	Rose
	Chinese holly
	Star jasmine
	Pyrenees cotoneaster
Sensitive E.C. x 10^3 = 2–3 or 4	Laurustinus
	Chinese hibiscus
	Heavenly bamboo
	Japanese pittosporoum
	Algerian ivy
Moderatley tolerant E.C. x 10^3 = 4–5 or 6	Spreading juniper
	Pyracantha
	Thorny elaeagnus
	Oriental arborvitae
	Indian hawthorn
	Japanese black pine
	Japanese boxwood
	Yellow sage
Moderately tolerant (con't)	Glossy privet
Tolerant E.C. x 10^3 = 6–8	Aleppo pine
	European fan palm
	Rosemary
	Spindle tree
	Blue dracaena
	Oleander
Most tolerant E.C. x 10^3 = 8–10	Croceum iceplant
	Purple iceplant
	Rosea iceplant
	White iceplant
	Ceniza
	Bougainvillea
	Natal plum

Exchangeable Sodium. Sodium problems arise when the exchangeable sodium is 20% or more. High sodium soils (sodic soils) can be reclaimed if the sodium can be replaced by another element, usually calcium. Applications of gypsum, elemental sulfur, or sulfuric acid have successfully reclaimed calcareous soils which are high in sodium, providing good permeability is present. Notations are made on the soil test report if either a sodium or salinity hazard exists. Table 3 lists the exchangeable sodium tolerances of some crops.

Sodium %	*Classification*
< 10	low
10–20	moderate
20–30	high
> 30	very high

Table 3. Tolerance of various crops to exchangeable-sodium-percentage.

Tolerance to ESP[1] and range at which crop is affected	Growth response under field conditions
Extremely sensitive (ESP = 2–10)	Sodium toxicity symptoms
Deciduous fruits	
Nuts	
Citrus	
Avocado	
Sensitive (ESP = 10–20)	Stunted growth at low ESP values even though the physical condition of the soil may be good
Beans	
Moderately tolerant (ESP = 20–40)	Stunted growth due to both nutritional factors and adverse soil conditions
Clover	
Oats	
Tall fescue	
Rice	
Dallisgrass	
Tolerant (ESP = 40–60)	Stunted growth usually due to adverse physical condition of soil
Wheat	
Cotton	
Alfalfa	
Barley	
Tomatoes	
Beets	
Most tolerant (ESP = more than 60)	Stunted growth usually due to adverse physical condition of soil
Crested wheatgrass	
Fairway wheatgrass	
Tall wheatgrass	
Rhodesgrass	

[1]ESP = exchangeable-sodium-percentage.

Organic Matter. Percentage of organic matter can be used toestimate nitrogen in the soil. This method alone is not always a dependable measure of available nitrogen, but is used with nitrate nitrogen to make nitrogen fertilizer recommendations on many crops.

Sand %	*Clay %*	*Classification*
< .5	< 1.0	very low
.5–1.0	1.0–2.0	low
1.0–1.5	2.0–3.0	moderate
> 1.5	> 3.0	high

Texture. Coarse-textured soils lack both nutrient and water holding capacities. Fine-textured soils often have structural and infiltration problems.

Material	*Texture*
Sand, loamy sand	coarse
Sandy loam, fine sandy loam	moderately coarse
Very fine sandy loam, loam, silt loam, silt	medium
Sandy clay, silty clay, clay	fine

Nitrate Nitrogen. Nitrate nitrogen is the measure of readily available nitrogen in the soil and is used with percentage of organic matter to make a nitrogen fertilizer recommendation. Because nitrate-N is highly soluble, it is subject to leaching in all soils, especially in coarse to medium textured soils. A fertilizer recommendation for nitrogen is more accurate if the subsoil is sampled 18 to 36 inches deep and tested for nitrate-N. Split applications of nitrogen fertilizer help reduce the potential for leaching. This practice is particularly important for sandy soils.

Parts per million	*Classification*
< 10	low
10–30	moderate
> 30	high

Bicarbonate Phosphorus. Soils in New Mexico are usually low in available phosphorus because phosphorus is quickly tied up in calcareous soils. Bicarbonate phosphorus, also known as $NaHCO_3$-P or Olsen-P, measures water soluble P, highly soluble calcium P, and organic P.

Parts per million	*Classification*
< 7	very low
8–14	low
15–22	moderate
23–30	high
> 31	very high

Soluble Potassium. Adequate potassium is usually available in the strongly weathered soils of New Mexico which have not been leached by high rainfall. Potassium does not readily tie up in calcareous soils and may be found at elevated levels in some saline soils. Potassium fertilizer responses may sometimes be observed on sandy soils with low cation-exchange capacities.

Parts per million	*Classification*
< 30	low
30–60	moderate
< 60	high

DTPA Extractable Iron. Iron deficiency is often a problem with sensitive crops grown in soils with pH values over 7.5. Although the critical level of iron in soils is 4.5 ppm, iron-sensitive crops often can be grown satisfactorily down to levels of 2.5 ppm if rooting is not restricted by caliche or gypsum, and care is taken not to over-irrigate. Some crop varieties are more susceptible to iron deficiency than other varieties.

Parts per million	*Classification*
< 2.5	low
2.5–4.5	moderate
> 4.5	high

DPTA Extractable Zinc. Zinc deficiency is an important problem in some crops, especially corn and grain sorghum. It is especially a problem in soils with pH values over 7.5 or soils that have a long history of heavy P fertilization. Some crop varieties may be more sensitive to zinc deficiency than other varieties.

Parts per million	*Classification*
< 0.5	low
0.5–1.0	moderate
> 1.0	high

DPTA Extractable Copper. Copper deficiencies have not been verified in New Mexico. Factors contributing to copper deficiencies include high organic matter, sandy texture, and high pH.

Parts per million	*Classification*
< 0.3	low
0.3–1.0	moderate
> 1.0	high

DTPA Extractable Manganese. Manganese deficiencies have not been verified in New Mexico. They usually occur under conditions similar to those in which iron and zinc deficiencies occur. Manganese

levels in the soil can also vary with the soil moisture content.

Parts per million	*Classification*
< 1.0	low
1.0–2.5	moderate
> 2.5	high

Conversion Factors

Soil test results can be converted from parts per million (ppm) to pounds per acre by multiplying ppm by a conversion factor based on the depth to which the soil was sampled. Because a slice of soil 1 acre in area and 3 inches deep weighs approximately 1 million pounds, the following conversion factors can be used:

Soil sample depth inches	*Multiply ppm by*
3	1
6	2
7	2.33
8	2.66
9	3
10	3.33
12	4

Fertility Considerations

A good soil sample and an accurate soil test interpretation are not the only considerations for good yields and maximum profit in crop production. Although the appropriate amounts of fertilizer based on a soil test are recommended and applied, other factors override the effects of fertilizer by limiting the yield potential of a crop. These factors include 1) the soil type in the field, 2) proper insect and disease control, 3) irrigation water quality, and 4) irrigation water management. Of these factors, the soil type and irrigation water quality are difficult for the grower to control. However, insect and disease control and water management are under the direct control of the grower and his management skills. Favorable fertilizer response is usually related to how well a crop is managed.

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Las Cruces, NM
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SECTION 8 SPILLS AND DISCHARGES

8.1 Spills

Appropriate measures necessary to prevent spills and to cleanup spills of any toxic and other pollutants shall be taken. If possible spills are anticipated, materials handling procedures and storage must be specified in the NMP.

8.1.1 Spill Notification

All spills must be reported to EPA and NMED.

The permittee shall report any noncompliance that may endanger human health or the environment. Any information must be provided orally to within twenty-four (24) hours from the time that the permittee becomes aware of the circumstances to EPA at 214-665-6595. A written submission shall also be provided to EPA within fourteen (14) days of the time the permittee becomes aware of the circumstances.

The report shall contain the following information:

- A description of the noncompliance and its cause;
- The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
- Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

8.1.2 Spill Control Practices

The following practices will be followed for spill prevention and cleanup:

- Manufacturers= recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of size.

8.2 Discharges

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. The permittee shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and

maintenance includes the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

8.2.1 Discharge Notification

All discharges must be reported to EPA and NMED.

If, for any reason, there is a discharge of pollutants to a water of the United States, the permittee is required to make immediate oral notification within 24-hours to EPA Region 6, Compliance and Assurance Division, Water Enforcement Branch (6EN-W), Dallas, Texas at 214-665-6595, and notify EPA and NMED in writing within fourteen (14) working days of the discharge from the facility. In addition, the permittee shall keep a copy of the notification submitted to EPA together with the other records required by this permit. The discharge notification shall include the following information:

- A description of the discharge and its cause, including a description of the flow path to the receiving water body and an estimate of the flow and volume discharged.
- The period of non-compliance, including exact dates and times, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate and prevent recurrence of the discharge.

8.2.2 Monitoring Requirements for All Discharges from Retention Structures

In the event of any overflow or other discharge of pollutants from a manure and/or wastewater storage or retention structure, whether or not authorized by this permit, the following actions shall be taken:

1. All discharges shall be sampled and analyzed.

   Samples must, at a minimum, be analyzed for the following parameters: total nitrogen, nitrate nitrogen, ammonia nitrogen, total phosphorus, *E. coli* bacteria, five-day biochemical oxygen demand (BOD_5), total suspended solids, pH, and temperature. The discharge must be analyzed in accordance with approved EPA methods for water analysis listed in 40 CFR Part 136.
2. Record an estimate of the volume of the release and the date and time.
3. Samples shall consist of grab samples collected from the over-flow or discharges from the retention structure. A minimum of one sample shall be collected from the initial discharge (within 30 minutes). The sample shall be collected and analyzed in accordance with EPA approved methods for water analysis listed in 40 CFR 136. Samples collected shall be representative of the monitored discharge.
4. If conditions are not safe for sampling, the permittee must provide documentation of why samples could not be collected and analyzed. For example, the permittee may be unable to collect samples during dangerous weather conditions (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.). However, once dangerous conditions have passed, the permittee shall collect a sample from the retention structure (pond or lagoon) from which the discharge occurred.

5. Monitoring results must be submitted to EPA Region 6, Compliance Assurance and Enforcement Division, within thirty (30) days of the discharge event at the address listed in Part V.1 of this permit.

SECTION 9 CLOSURES

9.1 Closure of Lagoons and other Manure, Process Wastewater Storage and Handling Structures

The following conditions shall apply to the closure of lagoons and other earthen or synthetic lined basins and other manure, litter, or process wastewater storage and handling structures:

1) Closure of Lagoons and Other Surface Impoundments
   a) No lagoon or other earthen or synthetic lined basin shall be permanently abandoned.
   b) Lagoons and other earthen or synthetic lined basins shall be maintained at all times until closed.
   c) All lagoons and other earthen or synthetic lined basins must be properly closed if the permittee ceases operation. In addition, any lagoon or other earthen or synthetic lined basin that is not in use for a period of twelve (12) consecutive months must be properly closed unless the facility is financially viable, intends to resume use of the structure at a later date, and either:
      i) maintains the structure as though it were actively in use, to prevent compromise of structural integrity; or
      ii) removes manure and wastewater to a depth of one foot or less and refills the structure with clean water to preserve the integrity of the synthetic or earthen liner. In either case, the permittee shall submit a written report to EPA within thirty (30) days of basin closure detailing the actions taken , and shall conduct routine inspections, maintenance, and record keeping as though the structure were in use. Prior to restoration of use of the structure, the permittee shall notify EPA in writing and provide the opportunity for inspection.
   d) All closure of lagoons and other earthen or synthetic lined basins must be consistent with New Mexico NRCS Conservation Practice Standard Code 360 (Closure of Waste Impoundments). Consistent with this standard the permittee shall remove all waste materials to the maximum extent practicable and dispose of them in accordance with the permittee's nutrient management plan, unless otherwise authorized by EPA.
   e) Unless otherwise authorized by EPA, completion of closure for lagoons and other earthen or synthetic lined basins shall occur as promptly as practicable after the permittee ceases to operate or, if the permittee has not ceased operations, twelve (12) months from the date on which the use of the structure ceased, unless the lagoons or basins are being maintained for possible future use in accordance with the requirements above.

2) No other manure, litter, or process wastewater storage and handling structure shall be abandoned. Closure of all such structures shall occur as promptly as practicable after the permittee has ceased to operate, or, if the permittee has not ceased to operate, within twelve (12) months after the date on which the use of the structure ceased. To close a manure, litter, or process wastewater storage and handling structure, the permittee shall remove all manure, litter, or process wastewater and dispose of it in accordance with the permittee's nutrient management plan, or document its transfer from the permitted facility in accordance with off-site transfer requirements.

SECTION 10 CERTIFICATIONS

10.1 Permittee Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or 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 the 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."

Name (Type or Print): Don Oppliger

Title (Type or Print): Owner

Phone No.: 575-389-5321

Signature:

Date: 12/12/09

All applications, reports or information submitted to the EPA or required by General Permit NMG010000 shall be signed and certified consistent with 40 CFR §122.22 (attached).

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Title 40: Protection of Environment

PART 122—EPA ADMINISTERED PERMIT PROGRAMS: THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
Subpart B—Permit Application and Special NPDES Program Requirements

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§ 122.22 Signatories to permit applications and reports (applicable to State programs, see §123.25).

(a) *Applications.* All permit applications shall be signed as follows:

(1) *For a corporation.* By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who perfoms similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

Note: EPA does not require specific assignments or delegations of authority to responsible corporate officers identified in §122.22(a)(1)(i). The Agency will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the Director to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions under §122.22(a)(1)(ii) rather than to specific individuals.

(2) *For a partnership or sole proprietorship.* By a general partner or the proprietor, respectively; or

(3) *For a municipality, State, Federal, or other public agency.* By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes: (i) The chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

(b) All reports required by permits, and other information requested by the Director shall be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a) of this section;

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) and,

(3) The written authorization is submitted to the Director.

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d) (*fication.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

certify under penalty of law that this document and all attachments were prepared under my direction or 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 the 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.

(Clean Water Act (33 U.S.C. 1251 *et seq.*), Safe Drinking Water Act (42 U.S.C. 300f *et seq.*), Clean Air Act (42 U.S.C. 7401 *et seq.*), Resource Conservation and Recovery Act (42 U.S.C. 6901 *et seq.*))

[48 FR 14153, Apr. 1, 1983, as amended at 48 FR 39619, Sept. 1, 1983; 49 FR 38047, Sept. 29, 1984; 50 FR 6941, Feb. 19, 1985; 55 FR 48063, Nov. 16, 1990; 65 FR 30907, May 15, 2000]

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Section 508 / Accessibility

10.2 Certified Specialists

Brad Wieck with Enviro-Ag Engineering, Inc. meets the qualifications of a certified planner/specialist in New Mexico. Documentation from the New Mexico USDA-NRCS is attached.

United States Department of Agriculture
Natural Resources Conservation Service

TechReg Technical Service Provider Registry

Technical Service Provider Resume

ANISSA M PURSWELL
3404 AIRWAY BLVD
AMARILLO, TX 79118

Phone: (806) 353-6123
Email: anissa@enviroag.com

Preferred Contact Method: Email
Can speak Spanish: No
TSP Type: Individual TSP

B - Associated Companies/Agencies

Business Name	Business Id

C1 - Relevant Accreditation/Licenses

Certifying Organization	State	Certification Description	License Number	Expiration Date
State Government	TX	Nutrient Management State Certification	xxx3041	12/31/2009
University of Tennesee or Iowa State University	All	Manure Wastewater Handling and Storage Certification	xx-125	05/25/2010
University of Tennesee or Iowa State University	All	Nutrient Management - Organic and Inorganic Certification	xx-125	05/25/2010
University of Tennesee or Iowa State University	All	CNMP Plan Development - Land Treatment Certification	xx-125	05/25/2010
University of Tennesee or Iowa State University	All	CNMP Plan Development - MWHS Certification	xx-125	05/25/2010
University of Tennesee or Iowa State University	All	CNMP Plan Development - Nutrient Management Certification	xx-125	05/25/2010
University of Tennesee or Iowa State University	All	CNMP Plan Development - Total Plan Certification	xx-125	05/25/2010

C2 - Organic Qualification

Organic Qualification

D - Education and Training

Institution Name	Area of Study	Degree	Completion Date
Texas A&M University	Agricultural Engineering	Bachelor of Science	12/15/1998
Texas A&M University	Agricultural Journalism	Bachelor of Science	12/15/1998
Texas A&M University	Agricultural Engineering	Master of Engineerin	12/15/2001

E - Relevant Work Experience

Date	Description
04/24/2001	CAFO permit application preparation for dairies, feedyards and swine operations. Prepare CAFO Nutrient Management Plans and TCEQ Nutrient Utilization Plans for dairies, feedyards and swine operations. Assist with site design and layout for animal waste management and treatment systems. Field surveying using Global Positioning System technology. Soil sampling using GPS field grids. Experience with data processing and analysis using ArcView GIS. Air quality permit applications for grain elevators, feedmills, cottonseed delinting plants.
01/15/1999	Research included the design and construction of swine waste management treatment technologies. Wastewater sample collection and analysis. Statistical analysis of collected data. Teaching assistant for Water Quality Engineering course.
01/15/1994	Assisted with the design and implementation of construction wetlands for water quality. Assisted with preparation of course materials for Water Quality Engineering course and Onsite Wastewater Treatment training.

F - Familiarity with NRCS Guidelines, Criteria, Standards, and Specifications

Description
Animal Waste Management Field Handbook
Code 313 Waste Storage Facility
Code 316 Animal Mortality Facility
Code 317 Composting Facility
Code 359 Waste Treatment Lagoon
Code 360 Closure of Waste Impoundments
Code 362 Diversion

Code 378 Pond
Code 393 Filter Strip
Code 412 Grassed Waterways
Code 441 Irrigation: Microirrigation
Code 443 Irrigation: Surface and Subsurface
Code 521 Pond Sealing/Lining: Bentonite
Code 521A Pond Sealing/Lining: Flexible Membrane
Code 521B Pond Sealing/Lining: Soil Dispersant
Code 590 Nutrient Management
Code 633 Waste Utilization
Code 656 Constructed Wetlands
Code 785 Particulate Emissions Management

F1 - NRCS Conservation Planning Training Requirement

Description
I have received NRCS Training Modules or equivalent

F2 - NRCS TSP Orientation

Description
I have received the TSP Orientation Modules and Exam

G,H - Technical Services This TSP is Certified to Perform

State	Category	Technical Services
AZ	CNMP Plan Development - Land Treatment	Channel Bank Vegetation (322) Conservation Cover (327) Conservation Crop Rotation (328) Contour Buffer Strips (332) Contour Farming (330) Cover Crop (340) Cross Wind Ridges (589A) Cross Wind Trap Strips (589C) Deep Tillage (324) Diversion (362) Field Border (386) Filter Strip (393) Grassed Waterway (412) Hedgerow Planting (422) Herbaceous Wind Barriers (603) Hillside Ditch (423) Lined Waterway or Outlet (468) Mulching (484) Residue Management, Mulch Till (329B) Residue Management, No-Till/Strip Till (329A) Residue Management, Ridge Till (329C) Residue Management, Seasonal (344) Rock Barrier (555) Roof Runoff Structure (558) Row Arrangement (557) Runoff Management System (570) Soil Salinity Management-Nonirrigated (571) Stripcropping (585) Structure for Water Control (587) Subsurface Drain (606) Surface Roughening (609) Terrace (600) Underground Outlet (620) Vegetative Barrier (601) Waterspreading (640)
AZ	Nutrient Management - Organic and Inorganic	Nutrient Management (590) Waste Utilization (633)
AZ	CNMP Plan Development - Nutrient Management	Nutrient Management (590) Waste Utilization (633)
AZ	CNMP Plan Development - Feed Management	Feed Management (592)

CO	CNMP Plan Development - Land Treatment	Channel Bank Vegetation (322) Conservation Cover (327) Conservation Crop Rotation (328) Contour Buffer Strips (332) Contour Farming (330) Cover Crop (340) Cross Wind Ridges (589A) Cross Wind Trap Strips (589C) Deep Tillage (324) Diversion (362) Field Border (386) Filter Strip (393) Grassed Waterway (412) Hedgerow Planting (422) Herbaceous Wind Barriers (603) Hillside Ditch (423) Lined Waterway or Outlet (468) Mulching (484) Residue Management, Mulch Till (329B) Residue Management, No-Till/Strip Till (329A) Residue Management, Ridge Till (329C) Residue Management, Seasonal (344) Rock Barrier (555) Roof Runoff Structure (558) Row Arrangement (557) Runoff Management System (570) Soil Salinity Management-Nonirrigated (571) Stripcropping (585) Structure for Water Control (587) Subsurface Drain (606) Surface Roughening (609) Terrace (600) Underground Outlet (620) Vegetative Barrier (601) Waterspreading (640)
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KS	CNMP Plan Development - Land Treatment	Channel Bank Vegetation (322) Conservation Cover (327) Conservation Crop Rotation (328) Contour Buffer Strips (332) Contour Farming (330) Cover Crop (340) Cross Wind Ridges (589A) Cross Wind Trap Strips (589C) Deep Tillage (324) Diversion (362) Field Border (386) Filter Strip (393) Grassed Waterway (412) Hedgerow Planting (422) Herbaceous Wind Barriers (603) Hillside Ditch (423) Lined Waterway or Outlet (468) Mulching (484) Residue Management, Mulch Till (329B) Residue Management, No-Till/Strip Till (329A) Residue Management, Ridge Till (329C) Residue Management, Seasonal (344) Rock Barrier (555) Roof Runoff Structure (558) Row Arrangement (557) Runoff Management System (570) Soil Salinity Management-Nonirrigated (571) Stripcropping (585) Structure for Water Control (587) Subsurface Drain (606) Surface Roughening (609) Terrace (600) Underground Outlet (620) Vegetative Barrier (601) Waterspreading (640)
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KS	CNMP Plan Development - Feed Management	Feed Management (592)
NM	CNMP Plan Development - Land Treatment	Channel Bank Vegetation (322) Conservation Cover (327) Conservation Crop Rotation (328) Contour Buffer Strips (332) Contour Farming (330) Cover Crop (340) Cross Wind Ridges (589A) Cross Wind Trap Strips (589C) Deep Tillage (324) Diversion (362) Field Border (386) Filter Strip (393) Grassed Waterway (412) Hedgerow Planting (422) Herbaceous Wind Barriers (603)

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NM	CNMP Plan Development - Nutrient Management	Nutrient Management (590) Waste Utilization (633)
NM	CNMP Plan Development - Feed Management	Feed Management (592)
OK	CNMP Plan Development - Land Treatment	Channel Bank Vegetation (322) Conservation Cover (327) Conservation Crop Rotation (328) Contour Buffer Strips (332) Contour Farming (330) Cover Crop (340) Cross Wind Ridges (589A) Cross Wind Trap Strips (589C) Deep Tillage (324) Diversion (362) Field Border (386) Filter Strip (393) Grassed Waterway (412) Hedgerow Planting (422) Herbaceous Wind Barriers (603) Hillside Ditch (423) Lined Waterway or Outlet (468) Mulching (484) Residue Management, Mulch Till (329B) Residue Management, No-Till/Strip Till (329A) Residue Management, Ridge Till (329C) Residue Management, Seasonal (344) Rock Barrier (555) Roof Runoff Structure (558) Row Arrangement (557) Runoff Management System (570) Soil Salinity Management-Nonirrigated (571) Stripcropping (585) Structure for Water Control (587) Subsurface Drain (606) Surface Roughening (609) Terrace (600) Underground Outlet (620) Vegetative Barrier (601) Waterspreading (640)
OK	Nutrient Management - Organic and Inorganic	Nutrient Management (590) Waste Utilization (633)
OK	CNMP Plan Development - Nutrient Management	Nutrient Management (590) Waste Utilization (633)
OK	CNMP Plan Development - Feed Management	Feed Management (592)

TX	Land Treatment - Buffer	Contour Buffer Strips (332) Cross Wind Trap Strips (589C) Field Border (386) Filter Strip (393) Hedgerow Planting (422) Herbaceous Wind Barriers (603) Vegetative Barrier (601)
TX	Land Shaping	Bedding (310) Irrigation Land Leveling (464) Land Clearing (460) Land Reclamation, Landslide Treatment (453) Land Reconstruction, Abandoned Mined Land (543) Land Smoothing (466) Obstruction Removal (500) Precision Land Forming (462) Recreation Land Grading and Shaping (566) Spoil Spreading (572)
TX	Reservoir Sealing	Pond Sealing or Lining, Bentonite Sealant (521C) Pond Sealing or Lining, Flexible Membrane (521A) Pond Sealing or Lining, Soil Dispersant (521B)
TX	Surface Water Detention/Retention	Aquaculture Ponds (397) Dam (402) Dam, Diversion (348) Dike (356) Dry Hydrant (432) Fish Raceway or Tank (398) Grade Stabilization Structure (410) Irrigation or Regulating Reservoir (552) Irrigation Storage Reservoir (436) Irrigation System, Tailwater Recovery (447) Pond (378) Sediment Basin (350) Structure for Water Control (587) Subsurface Drain (606) Water and Sediment Control Basin (638) Wetland Creation (658) Wetland Enhancement (659) Wetland Restoration (657)
TX	Water Management (Drainage)	Bedding (310) Drainage Water Management (554) Mole Drain (482) Open Channel (582) Pumped Well Drain (532) Pumping Plant (533) Structure for Water Control (587) Subsurface Drain (606) Surface Drainage, Field Ditch (607) Surface Drainage, Main or Lateral (608) Underground Outlet (620) Vertical Drain (630)
TX	CNMP Plan Development - Land Treatment	Channel Bank Vegetation (322) Conservation Cover (327) Conservation Crop Rotation (328) Contour Buffer Strips (332) Contour Farming (330) Cover Crop (340) Cross Wind Ridges (589A) Cross Wind Trap Strips (589C) Deep Tillage (324) Diversion (362) Field Border (386) Filter Strip (393) Grassed Waterway (412) Hedgerow Planting (422) Herbaceous Wind Barriers (603) Hillside Ditch (423) Lined Waterway or Outlet (468) Mulching (484)

		Residue Management, Mulch Till (329B) Residue Management, No-Till/Strip Till (329A) Residue Management, Ridge Till (329C) Residue Management, Seasonal (344) Rock Barrier (555) Roof Runoff Structure (558) Row Arrangement (557) Runoff Management System (570) Soil Salinity Management-Nonirrigated (571) Stripcropping (585) Structure for Water Control (587) Subsurface Drain (606) Surface Roughening (609) Terrace (600) Underground Outlet (620) Vegetative Barrier (601) Waterspreading (640)
TX	CNMP Plan Development - Manure and Wastewater Handling and Storage	Animal Mortality Facility (316) Closure of Waste Impoundment (360) Composting Facility (317) Constructed Wetland (656) Heavy Use Area Protection (561) Manure Transfer (634) Pumping Plant (533) Roof Runoff Structure (558) Waste Storage Facility (313) Waste Treatment Lagoon (359) Waste Utilization (633) Wastewater Treatment Strip (635)
TX	CNMP Plan Development - Total Plan	Animal Mortality Facility (316) Channel Bank Vegetation (322) Closure of Waste Impoundment (360) Composting Facility (317) Conservation Cover (327) Conservation Crop Rotation (328) Constructed Wetland (656) Contour Buffer Strips (332) Contour Farming (330) Cover Crop (340) Cross Wind Ridges (589A) Cross Wind Trap Strips (589C) Deep Tillage (324) Diversion (362) Feed Management (592) Field Border (386) Filter Strip (393) Grassed Waterway (412) Heavy Use Area Protection (561) Hedgerow Planting (422) Herbaceous Wind Barriers (603) Hillside Ditch (423) Lined Waterway or Outlet (468) Manure Transfer (634) Mulching (484) Nutrient Management (590) Pumping Plant (533) Residue Management, Mulch Till (329B) Residue Management, No-Till/Strip Till (329A) Residue Management, Ridge Till (329C) Residue Management, Seasonal (344) Rock Barrier (555) Roof Runoff Structure (558) Row Arrangement (557) Runoff Management System (570) Soil Salinity Management-Nonirrigated (571) Stripcropping (585) Structure for Water Control (587) Subsurface Drain (606) Surface Roughening (609)

		Terrace (600) Underground Outlet (620) Vegetative Barrier (601) Waste Storage Facility (313) Waste Treatment Lagoon (359) Waste Utilization (633) Wastewater Treatment Strip (635) Waterspreading (640)
TX	Non Irrigation Water Conveyance	Dry Hydrant (432) Pipeline (516) Spring Development (574)
TX	Nutrient Management - Organic and Inorganic	Nutrient Management (590) Waste Utilization (633)
TX	Land Treatment - Vegetative Land Stabilization	Channel Bank Vegetation (322) Conservation Cover (327) Cover Crop (340) Mulching (484)
TX	CNMP Plan Approval	Animal Mortality Facility (316) Channel Bank Vegetation (322) Closure of Waste Impoundment (360) Composting Facility (317) Conservation Cover (327) Conservation Crop Rotation (328) Constructed Wetland (656) Contour Buffer Strips (332) Contour Farming (330) Cover Crop (340) Cross Wind Ridges (589A) Cross Wind Trap Strips (589C) Deep Tillage (324) Diversion (362) Feed Management (592) Field Border (386) Filter Strip (393) Grassed Waterway (412) Heavy Use Area Protection (561) Hedgerow Planting (422) Herbaceous Wind Barriers (603) Hillside Ditch (423) Lined Waterway or Outlet (468) Manure Transfer (634) Mulching (484) Nutrient Management (590) Pumping Plant (533) Residue Management, Mulch Till (329B) Residue Management, No-Till/Strip Till (329A) Residue Management, Ridge Till (329C) Residue Management, Seasonal (344) Rock Barrier (555) Roof Runoff Structure (558) Row Arrangement (557) Runoff Management System (570) Stripcropping (585) Structure for Water Control (587) Subsurface Drain (606) Surface Roughening (609) Terrace (600) Underground Outlet (620) Vegetative Barrier (601) Waste Storage Facility (313) Waste Treatment Lagoon (359) Waste Utilization (633) Wastewater Treatment Strip (635) Waterspreading (640)
TX	CNMP Plan Development - Nutrient Management	Nutrient Management (590) Waste Utilization (633)

TX	Manure and Wastewater Handling and Storage	Animal Mortality Facility (316) Closure of Waste Impoundment (360) Composting Facility (317) Constructed Wetland (656) Heavy Use Area Protection (561) Manure Transfer (634) Pumping Plant (533) Roof Runoff Structure (558) Waste Storage Facility (313) Waste Treatment Lagoon (359) Waste Utilization (633) Wastewater Treatment Strip (635)
TX	CNMP Plan Development - Feed Management	Feed Management (592)
TX	CAP - CNMP Plan Approval	Animal Mortality Facility (316) Channel Bank Vegetation (322) Closure of Waste Impoundment (360) Composting Facility (317) Conservation Cover (327) Conservation Crop Rotation (328) Constructed Wetland (656) Contour Buffer Strips (332) Contour Farming (330) Cover Crop (340) Cross Wind Ridges (589A) Cross Wind Trap Strips (589C) Deep Tillage (324) Diversion (362) Feed Management (592) Field Border (386) Filter Strip (393) Grassed Waterway (412) Heavy Use Area Protection (561) Hedgerow Planting (422) Herbaceous Wind Barriers (603) Hillside Ditch (423) Lined Waterway or Outlet (468) Manure Transfer (634) Mulching (484) Nutrient Management (590) Pumping Plant (533) Residue Management, Mulch Till (329B) Residue Management, No-Till/Strip Till (329A) Residue Management, Ridge Till (329C) Residue Management, Seasonal (344) Rock Barrier (555) Roof Runoff Structure (558) Row Arrangement (557) Runoff Management System (570) Stripcropping (585) Structure for Water Control (587) Subsurface Drain (606) Surface Roughening (609) Terrace (600) Underground Outlet (620) Vegetative Barrier (601) Waste Storage Facility (313) Waste Treatment Lagoon (359) Waste Utilization (633) Wastewater Treatment Strip (635) Waterspreading (640)

I - States and Counties This TSP Provides Technical Services In

State	Counties Where Technical Services Are Provided
AZ	All Counties
CO	All Counties
IA	All Counties
KS	All Counties

NM	All Counties
OK	All Counties
TX	All Counties

CNMP Planners in New Mexico
(current as of November 2009)

AREA	NRCS Planner	TSP Planner (potentially statewide)	Planner and New Mexico Professional Engineer
East	Rachel Armstrong-m,l,n,c	Mary Barron-m,l,n	
	Matt Wiseman-m,l,n	Mike Smith	Brad Wieck-m,l,n
	Mark Lewis-l,n	Kyle Keim-l,n,c	
	Johnna Wier-l,n	Chet Wyant –l	
	Sean Lewis - l,n		
	Dean Bruce – l, n	Jay Lazarus	
NW	Mark McKinley - m	John McCatharn-m,l,n	John McCatharn-m,l,n
	Hope Tran - m	Reddy Ganta –l	Mark McKinley-m
		Jordan Vaughn	
SE	Tom Marshall-l,n,c	Joy Wagner	
	Raquel Montoya – l, n	Loney Ashcraft-m,l,n	
	Louis King-m,l,n	Carroll French –c	
	Tim Henry-l,n	Brad Wieck-m,l,n	
	Dean Pritchett-m,l,n	Linda Armstrong	
SW	Santiago Misquez-l,n	Gill Sorg –m,l,n	
	Mary Sanchez – l, n	Darrel Reasner-l,n	
	Luis Garcia – l,n		
SO	Linda Scheffe-m,l,n		
	Rudy Garcia – l, n		

M= Manure Handling and Storage Specialist
L = Land Treatment Specialist
N = Nutrient Management Specialist
C = New Mexico Certified Crop Adviser

SECTION 11 RECORD KEEPING FORMS

11.1 Soil and Manure/Wastewater Nutrient Analysis

SOIL ANALYSIS REPORT

CLIENT: 6224	ENVIRO-AG ENGINEERING INC 3404 AIRWAY BLVD AMARILLO, TX 79118

Servi-Tech Laboratories
www.servitechlabs.com

6921 S. Bell
Amarillo, TX 79109
800.557.7509
806.677.0093
Fax 806.677.0329

LAB NO:	8208 - 8209
INVOICE NO:	115161
DATE RECEIVED:	11/08/2010
DATE REPORTED:	11/09/2010

SOIL ANALYSIS RESULTS FOR: OPPLIGER FY SOUTH **FIELD IDENTIFICATION:** LMU 1

METHOD USED:			2:1 Water-Soil		2:1 Water-Soil		Mod. WB	Cd Reduction		Mehlich 3 ICP	Ammonium Acetate						DTPA				
Lab Number	Sample ID	Sample Depth	Soil pH	Buffer pH	Sol. Salts mmho/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	Boron ppm B
8208	LMU 1	0 - 6	8.0		0.40	No	1.8	29	52	200	604	32	58	2275	684	100	5.3				
8209	LMU 1	6 - 24	8.1		0.45	No	0.7	25	135	52	400	53	286	3038	742	137	1.5				

FERTILIZER RECOMMENDATIONS: POUNDS ACTUAL NUTRIENT PER ACRE

Lab Number	Sample ID	Crop To Be Grown	Yield Goal	Lime, ECC Tons/A to raise pH to: 6.0	6.5	7.0	N	P_2O_5	K_2O	Zn	S	Mn	Cu	MgO	B	Ca	Cl
8208	LMU 1																
8209	LMU 1																

Cation Exchange Capacity

CEC	%H	%K	%Ca	%Mg	%Na
19	0	8	60	30	2
23	0	4	66	27	3

SPECIAL COMMENTS AND SUGGESTIONS:

Lab Number(s): 8208
Servi-Tech Laboratory fertilizer recommendations were not requested.

Analyses are representative of the samples submitted

Samples are retained 30 days after report of analysis

Explanations of soil analysis terms are available upon request

Reviewed and Approved By: Brandon Hulsey, Quality Assurance Officer

Brandon Hulsey

11/09/2010 5:00 pm

SOIL ANALYSIS REPORT

CLIENT: 6224	ENVIRO-AG ENGINEERING INC 3404 AIRWAY BLVD AMARILLO, TX 79118

Servi-Tech Laboratories
www.servitechlabs.com

6921 S. Bell
Amarillo, TX 79109
800.557.7509
806.677.0093
Fax 806.677.0329

LAB NO:	8210 - 8211
INVOICE NO:	115161
DATE RECEIVED:	11/08/2010
DATE REPORTED:	11/09/2010

SOIL ANALYSIS RESULTS FOR OPPLIGER FY SOUTH **FIELD IDENTIFICATION:** LMU 2

METHOD USED:			2:1 Water-Soil		2:1 Water-Soil		Mod. WB	Cd Reduction		Mehlich 3 ICP	Ammonium Acetate						DTPA				
Lab Number	Sample ID	Sample Depth	Soil pH	Buffer pH	Sol. Salts mmho/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	Boron ppm B
8210	LMU 2	0 - 6	7.9		0.40	No	1.7	35	63	250	514	34	61	2118	575	78	5.8				
8211	LMU 2	6 - 24	8.1		0.40	Lo	0.7	24	130	59	275	42	227	3081	599	110	1.3				

FERTILIZER RECOMMENDATIONS: POUNDS ACTUAL NUTRIENT PER ACRE

Lab Number	Sample ID	Crop To Be Grown	Yield Goal	Lime, ECC Tons/A to raise pH to: 6.0	6.5	7.0	N	P_2O_5	K_2O	Zn	S	Mn	Cu	MgO	B	Ca	Cl
8210	LMU 2																
8211	LMU 2																

Cation Exchange Capacity

CEC	%H	%K	%Ca	%Mg	%Na
17	0	8	62	28	2
22	0	3	71	23	2

SPECIAL COMMENTS AND SUGGESTIONS:

Lab Number(s): 8211
CEC calculated by cation summation may overestimate true CEC and underestimate exchangeable sodium percentage (ESP) in soils containing excess lime.

Lab Number(s): 8210
Servi-Tech Laboratory fertilizer recommendations were not requested.

Analyses are representative of the samples submitted

Samples are retained 30 days after report of analysis

Explanations of soil analysis terms are available upon request

Reviewed and Approved By: Brandon Hulsey, Quality Assurance Officer

Brandon Hulsey

11/09/2010 5:00 pm

SOIL ANALYSIS REPORT

CLIENT: 6224	ENVIRO-AG ENGINEERING INC 3404 AIRWAY BLVD AMARILLO, TX 79118

Servi-Tech Laboratories
www.servitechlabs.com

6921 S. Bell
Amarillo, TX 79109
800.557.7509
806.677.0093
Fax 806.677.0329

LAB NO:	8212 - 8213
INVOICE NO:	115161
DATE RECEIVED:	11/08/2010
DATE REPORTED:	11/09/2010

SOIL ANALYSIS RESULTS FOR: OPPLIGER FY SOUTH **FIELD IDENTIFICATION:** LMU 3A

METHOD USED:			2:1 Water-Soil		2:1 Water-Soil		Mod. WB	Cd Reduction		Mehlich 3 ICP	Ammonium Acetate						DTPA				
Lab Number	Sample ID	Sample Depth	Soil pH	Buffer pH	Sol. Salts mmho/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	Boron ppm B
8212	LMU 3A	0 - 6	8.0		0.38	No	1.5	25	45	259	939	41	74	1900	566	86	4.8				
8213	LMU 3A	6 - 24	8.1		0.53	Lo	0.8	29	157	50	848	73	394	2466	692	133	1.0				

FERTILIZER RECOMMENDATIONS: POUNDS ACTUAL NUTRIENT PER ACRE

Lab Number	Sample ID	Crop To Be Grown	Yield Goal	Lime, ECC Tons/A to raise pH to: 6.0	6.5	7.0	N	P_2O_5	K_2O	Zn	S	Mn	Cu	MgO	B	Ca	Cl
8212	LMU 3A																
8213	LMU 3A																

Cation Exchange Capacity

CEC	%H	%K	%Ca	%Mg	%Na
17	0	14	56	28	2
21	0	10	59	28	3

SPECIAL COMMENTS AND SUGGESTIONS:

Lab Number(s): 8213
CEC calculated by cation summation may overestimate true CEC and underestimate exchangeable sodium percentage (ESP) in soils containing excess lime.

Lab Number(s): 8212
Servi-Tech Laboratory fertilizer recommendations were not requested.

Analyses are representative of the samples submitted

Samples are retained 30 days after report of analysis

Reviewed and Approved By: Brandon Hulsey, Quality Assurance Officer

Brandon Hulsey

Explanations of soil analysis terms are available upon request

11/09/2010 5:01 pm

SOIL ANALYSIS REPORT

CLIENT: 6224	ENVIRO-AG ENGINEERING INC 3404 AIRWAY BLVD AMARILLO, TX 79118

Servi-Tech Laboratories
www.servitechlabs.com

6921 S. Bell
Amarillo, TX 79109
800.557.7509
806.677.0093
Fax 806.677.0329

LAB NO:	8214 - 8215
INVOICE NO:	115161
DATE RECEIVED:	11/08/2010
DATE REPORTED:	11/09/2010

SOIL ANALYSIS RESULTS FOR OPPLIGER FY SOUTH **FIELD IDENTIFICATION:** LMU 3B

METHOD USED:			2:1 Water-Soil		2:1 Water-Soil		Mod. WB	Cd Reduction		Mehlich 3 ICP	Ammonium Acetate						DTPA				
Lab Number	Sample ID	Sample Depth	Soil pH	Buffer pH	Sol. Salts mmho/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	Boron ppm B
8214	LMU 3B	0 - 6	7.8		0.64	No	1.7	90	162	266	1067	51	92	2351	611	85	5.0				
8215	LMU 3B	6 - 24	8.0		0.55	Lo	0.7	56	302	77	831	56	302	2814	666	111	1.4				

FERTILIZER RECOMMENDATIONS: POUNDS ACTUAL NUTRIENT PER ACRE

Lab Number	Sample ID	Crop To Be Grown	Yield Goal	Lime, ECC Tons/A to raise pH to: 6.0	6.5	7.0	N	P_2O_5	K_2O	Zn	S	Mn	Cu	MgO	B	Ca	Cl
8214	LMU 3B																
8215	LMU 3B																

Cation Exchange Capacity

CEC	%H	%K	%Ca	%Mg	%Na
20	0	14	59	26	2
22	0	10	63	25	2

SPECIAL COMMENTS AND SUGGESTIONS:

Lab Number(s):8215
CEC calculated by cation summation may overestimate true CEC and underestimate exchangeable sodium percentage (ESP) in soils containing excess lime.

Lab Number(s):8214
Servi-Tech Laboratory fertilizer recommendations were not requested.

Analyses are representative of the samples submitted

Samples are retained 30 days after report of analysis

Explanations of soil analysis terms are available upon request

Reviewed and Approved By: Brandon Hulsey, Quality Assurance Officer

Brandon Hulsey

11/09/2010 5:01 pm

SOIL ANALYSIS REPORT

CLIENT: 6224	ENVIRO-AG ENGINEERING INC 3404 AIRWAY BLVD AMARILLO, TX 79118

Servi-Tech Laboratories
www.servitechlabs.com

6921 S. Bell
Amarillo, TX 79109
800.557.7509
806.677.0093
Fax 806.677.0329

LAB NO:	8216 - 8217
INVOICE NO:	115161
DATE RECEIVED:	11/08/2010
DATE REPORTED:	11/09/2010

SOIL ANALYSIS RESULTS FOR: OPPLIGER FY SOUTH **FIELD IDENTIFICATION:** LMU 4

METHOD USED:			2:1 Water-Soil		2:1 Water-Soil		Mod. WB	Cd Reduction		Mehlich 3 ICP	Ammonium Acetate						DTPA				
Lab Number	Sample ID	Sample Depth	Soil pH	Buffer pH	Sol. Salts mmho/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	Boron ppm B
8216	LMU 4	0 - 6	7.8		0.38	Lo	1.5	46	83	137	795	24	43	2843	465	39	4.4				
8217	LMU 4	6 - 24	8.0		0.40	Hi	0.7	30	162	46	440	31	167	3226	554	65	1.1				

FERTILIZER RECOMMENDATIONS: POUNDS ACTUAL NUTRIENT PER ACRE

Lab Number	Sample ID	Crop To Be Grown	Yield Goal	Lime, ECC Tons/A to raise pH to: 6.0	6.5	7.0	N	P_2O_5	K_2O	Zn	S	Mn	Cu	MgO	B	Ca	Cl
8216	LMU 4																
8217	LMU 4																

Cation Exchange Capacity

CEC	%H	%K	%Ca	%Mg	%Na
20	0	10	70	19	1
22	0	5	73	21	1

SPECIAL COMMENTS AND SUGGESTIONS:

Lab Number(s):8216, 8217
CEC calculated by cation summation may overestimate true CEC and underestimate exchangeable sodium percentage (ESP) in soils containing excess lime.

Lab Number(s):8216
Servi-Tech Laboratory fertilizer recommendations were not requested.

Analyses are representative of the samples submitted

Samples are retained 30 days after report of analysis

Explanations of soil analysis terms are available upon request

Reviewed and Approved By: Brandon Hulsey, Quality Assurance Officer

Brandon Hulsey

11/09/2010 5:01 pm

SOIL SAMPLE CHAIN OF CUSTODY RECORD

Enviro-Ag Engineering, Inc.
404 Airway Blvd, Amarillo, TX 79118
Tel. 806-353-6123 Fax 806-353-4132

Producer/Facility: Oppliger FY South
County:
Date Sampled: 11-5-10
Date Shipped: 11-8-10

Project Manager:

Lab Use	Sample ID/Description	Depth	Crop	YG	Test Requested
	1 LMU#1	0 to 6			TCEQ-Basic
	2 "	6 to 24			
	3 LMU#2	0 to 6			
	4 "	6 to 24			
	5 LMU#3a	0 to 6			
	6 "	6 to 24			
	7 LMU#3b	0 to 6			
	8 "	6 to 24			
	9 LMU#4	0 to 6			
	10 "	6 to 24			
	11	to			
	12	to			
	13	to			
	14	to			
	15	to			
	16	to			
	17	to			
	18	to			
	19	to			
	20	to			
	21	to			
	22	to			
	23	to			
	24	to			
	25	to			

Relinquished By: [signature] Relinquished By: Relinquished By:
Company: EAE Company: Company:
Date/Time: 11-8-10 11:00a Date/Time: Date/Time:
Received By: Mary Ittu Received By: Received By:
Company: SOJ Ittu Company: Company:

Comments:

Servi-Tech Laboratories

6921 S. Bell • Amarillo, TX 79109
www.servitechlabs.com

Phone: 806.677.0093
800.557.7509
Fax: 806.677.0329

Lab No.: **538**

LABORATORY ANALYSIS REPORT

Report Date: 11/12/2010 11:50 am

Send To: 6224

ENVIRO-AG ENGINEERING INC
3404 AIRWAY BLVD
AMARILLO, TX 79118

Todd Whatley
Laboratory Manager

Results For: OPPLIGER SOUTH FEEDYARD
Sample ID: MANURE
Date Received: 11/08/2010

Invoice No: 403100

		Analysis (dry basis)	Analysis (as rec'd)	Total content, lbs per ton (as rec'd)	Estimated available first year*, lbs per ton (as rec'd)
NUTRIENTS					
Nitrogen					
Total Nitrogen	%	3.10	2.29	45.8	27.1
Organic Nitrogen	%	2.37	1.75	35.0	16.2
Ammonium Nitrogen	%	0.736	0.544	10.9	10.9
Nitrate+Nitrite Nitrogen	%	0.001	0.001	<0.1	<0.1
Major and Secondary Nutrients					
Phosphorus	%	0.683	0.553		
Phosphorus as P2O5	%	1.56	1.26	25.2	22.7
Potassium	%	2.05	1.66		
Potassium as K2O	%	2.46	1.99	39.8	39.8
OTHER PROPERTIES					
Moisture	%		26.1		
Total Solids	%		73.9	1478	
Organic Matter	%	48.8	36.1	722	
Ash	%		37.8	756	
C:N Ratio	ratio		9.1		

* Assumes 46% of organic nitrogen available during first crop year after application. Assumes 100% of ammonium and nitrate nitrogen available, but should be adjusted for potential field losses at application site.

Servi-Tech Laboratories

6921 S. Bell • Amarillo, TX 79109
www.servitechlabs.com

Phone: 806.677.0093
800.557.7509
Fax: 806.677.0329

Lab No: **539**

LABORATORY ANALYSIS REPORT

Report Date: 11/12/2010 11:50 am

Send To: 6224	ENVIRO-AG ENGINEERING INC 3404 AIRWAY BLVD AMARILLO, TX 79118		Todd Whatley Laboratory Manager
Client Name: **Sample ID:** **Date Received:**	OPPLIGER SOUTH FEEDYARD WASTEWATER 11/08/2010	**Invoice No:**	403100

	Analysis results		lbs/acre-in	meq/L
NUTRIENTS				
Nitrogen				
Total Nitrogen	357	mg/L	81	
Organic Nitrogen	114	mg/L	26	
Ammonia Nitrogen	239	mg/L	54	17.1
Nitrate+Nitrite Nitrogen	4	mg/L	1	0.3
Major and Secondary Nutrients				
Phosphorus	101	mg/kg		
Phosphorus as P2O5	230	mg/kg	52	
Potassium	1040	mg/kg		26.6
Potassium as K2O	1250	mg/kg	283	
OTHER PROPERTIES				
Moisture	99.0	%		
Total Solids	1.0	%	2267	
Organic Matter	0.5	%	1134	
Ash	0.5	%		
C:N Ratio	8.1	ratio		

C-

Servi-Tech Laboratories

CHAIN-OF-CUSTODY / ANALYTICAL REQUEST DOCUMENT

1602 Parkwest Drive, Hastings, NE 68901 | 1816 East Wyatt Earp, Dodge City, KS 67801 | 6921 South Bell, Amarillo, TX 79109 | **800-557-7509**

Required Client Information: **Section A**

Company: Enviro-Ag Engineering, Inc.
Address: 3404 Airway Boulevard
Amarillo, TX 79118
Phone: 353-6123 Fax: 353-4132

Required Client Information: **Section B**

Report To: Enviro-Ag
Invoice To: Enviro-Ag
P.O.:
Project Name: Oppliger South FY
Project Number:

Page: of

Client Information (Check quote/contract):
Requested Due Date: *TAT:

* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.

Turn Around Time (TAT) in calendar days.

To Be Completed by Servi-Tech and Client **Section C**

Quote Reference:
Project Manager: Jarett Stovall
Project #:
Profile #:
Requested Analysis or Package:

Section D **Required** Client Information:

SAMPLE ID

Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
OTHER WATER	AQ
ENV. SOIL	SL
SOLID WASTE	SW
AG SOIL	AS
FEED	FD
FERTILIZER	FT
PLANT	PT
OTHER	OT

ITEM#	(Lab Use Only) LAB#	SAMPLE ID	MATRIX CODE	DATE COLLECTED mm/dd/yy	TIME COLLECTED hh: mm a/p	#Containers	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Total N.P.K.					Remarks
1		Manure	SW	11-5-10	9:00am	X							X					
2		Waste Water-B	AQ	11-5-10	9:20am	2	X	X					X					
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

Lab Use Only Paid
Sample Acceptable Yes No
Comments: CSX
Container: U B N S H O
Temp: 1 -1.6 °C Date/Initial:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Jarett Stovall
SIGNATURE of SAMPLER:
DATE signed: (MM / DD / YY) 11/8/10

Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
[signature]	11/8/10	10:30	[signature] / EAE	11-8-10	
[signature] / EAE	11-8-10	11:00	Mary Ann Servitech	11/8/10	11:00a.

LEGENDS

11.2 Daily and Weekly Logs

Facility Name _____

DAILY/WEEKLY FACILITY INSPECTION

WEEK OF _____ THRU _____

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Weather	**Weather**	**Weather**	**Weather**	**Weather**	**Weather**	**Weather**
Temp:	Temp:	Temp:	Temp:	Temp:	Temp:	Temp:
Precip (a):	Precip (a):	Precip (a):	Precip (a):	Precip (a):	Precip (a):	Precip (a):
Sky Conditions:	Sky Conditions:	Sky Conditions:	Sky Conditions:	Sky Conditions:	Sky Conditions:	Sky Conditions:
Water Lines Inspection (b)	**Water Lines Inspection (b)**	**Water Lines Inspection (b)**	**Water Lines Inspection (b)**	**Water Lines Inspection (b)**	**Water Lines Inspection (b)**	**Water Lines Inspection (b)**
Inspected:	Inspected:	Inspected:	Inspected:	Inspected:	Inspected:	Inspected:

Irrigation		Irrigation		Irrigation		Irrigation		Irrigation		Irrigation		Irrigation	
Hours Pumped	Field #	Hours Pumped	Field #	Hours Pumped	Field #	Hours Pumped	Field #	Hours Pumped	Field #	Hours Pumped	Field #	Hours Pumped	Field #

Crop Yields		Crop Yields		Crop Yields		Crop Yields		Crop Yields		Crop Yields		Crop Yields	
Field #/Crop	Tons or Bu	Field #/Crop	Tons or Bu	Field #/Crop	Tons or Bu	Field #/Crop	Tons or Bu	Field #/Crop	Tons or Bu	Field #/Crop	Tons or Bu	Field #/Crop	Tons or Bu

On-Site Manure		On-Site Manure		On-Site Manure		On-Site Manure		On-Site Manure		On-Site Manure		On-Site Manure	
Tonnage Applied	Field #	Tonnage Applied	Field #	Tonnage Applied	Field #	Tonnage Applied	Field #	Tonnage Applied	Field #	Tonnage Applied	Field #	Tonnage Applied	Field #

WEEKLY RETENTION STRUCTURE INSPECTION REPORT

(Please answer Yes, No, N/A)

Seepage from embankment _____

Signs of cracks in embankment _____

Embankment erosion control present _____

Erosion on exterior slopes _____

Erosion on interior slopes _____

Trees within root zone of RCS _____

Excess solids present _____

OTHER STRUCTURAL CONTROLS

Terraces/dikes free of silt and functional _____

Sludge basins present and functional _____

Sludge basins need cleaning _____

Drainage area isolated _____

Pond Marker Reading _____ (in feet)

_____ (in feet)

_____ (in feet)

_____

PREVENTATIVE MAINTENANCE LOG

Motors of Dewatering Equipment

Check oil levels _____

Change oil/lube bearings _____

Electric panel inspected _____

System fully operational _____

Pumps/Agitators/Screens

Operational _____

Check oil/lubricate _____

Agitator Operational _____

Screen openings clean and operational _____

Scrapers/augers operational _____

Sprinkler Systems

Check oil in gearboxes _____

Grease/lube bearings and chains _____

Properly secure/drain system for winter _____

Replace leaky joints and worn nozzles _____

Inspect hoses for wear and leaks _____

Valves operational _____

Flowline free of leaks _____

Notes: _____

(a) If rainfall exceeds 1 inch, record the pond marker level for that day.

Record sky conditions 24 hours before and after land application.

(b) Inspect all water lines, including drinking water and cooling water lines, located within the drainage area of the ponds.

Created By: Enviro-Ag Engineering, Inc.

11.3 Manure Transfer

Date	Amount Removed (tons)	Recipient	Address of Recipient

11.4 Animal Mortality Handling Practices

Date:	Animal Mortality Practices Reviewed:	Inspector's Signature	Comments
Example: *Jan. 2009*	*Rendering*	*Facility Manager*	

11.5 Discharge/Spills from all Manure and Wastewater Storage Structures

Complete the following information in the event of a discharge. Make a copy of the completed form and submit to the EPA and NMED within 14 days of the discharge. Maintain the original in the PPP.

Cause of discharge:

_____

_____

Flow path description to the body of water discharged into:

_____

_____

Volume and flow estimates of discharge:

_____

_____

Discharge starting date: _____ Time: _____
Discharge ending date: _____ Time: _____

Steps being taken to reduce, eliminate, and prevent future discharge:

_____

_____

Were samples taken? ☐ Yes ☐ No

If yes, where were the samples sent? _____

Date submitted _____

Attach chain of custody report and analysis to this form.

If the discharge is caused by precipitation, fill out the following:

Date	Time Started	Time Ending	Rainfall Measurement

Was EPA notified within 24 hours of the discharge? ☐ Yes ☐ No

Date written notification was sent to EPA: _____

Date written notification was sent to NMED: _____

SAMPLING

Sampling Containers:
Polyethylene or glass wide-mouth bottles with screw-caps should be used. Containers should never be reused without proper sterilization. Polyethylene containers are generally used in wastewater collection.

Number of Samples:
A minimum of one grab sample should be collected from the initial discharge (within 30 minutes when possible) form the RCS

If dangerous climatic conditions prohibit the collection of samples document the conditions PPP. Once dangerous conditions have passed, collect a sample from the RCS.

Sampling Procedures:
Locate a point where the discharge is leaving the RCS. The site selected should allow collection of a sample representative of the discharge.

Collect a gram sample directly into a sample bottle. Remove the bottle top cover and protect from contamination. Avoid touching the inside of the closure. Position the bottle towards the current flow and away from the hand of the collector. Hold the bottle securely at the base with one hand and plunge it mouth down into the water. The sampling depth should be 6 to 12 inches below the water surface. Tip the bottle slightly upwards to allow air to exit and the bottle to fill. Remove bottle from the stream and add appropriate preservative, if necessary. Tightly cap and label bottle.

Avoid collecting large nonhomogeneous particles and objects. Do not rinse the sample container with the sample. Collect approximately 1 liter of sample for each method of preservation. Fill the sample container completely when analyzing for ammonia to prevent nitrification.

Transfer of Custody and Shipment of Samples:
Cool sample to 39 degrees Fahrenheit and keep temperature constant until analysis. Insulated containers are preferable to assure proper maintenance of storage temperature. Sample bottle tops should not be immersed in water during shipment or storage.

Holding times, intervals between collection and analysis, should be as short as possible to minimize change in the sample. Holding times listed in sample parameters and preparation is maximum times accepted by the EPA.

Samples should be packed properly to prevent breakage. The shipping container should be sealed or locked so that any evidence of tampering may be readily detected. Use of tamper proof evidence tape is recommended.

Responsibility for proper packaging, labeling, and transferring of possession of the sample lies with the person taking it.

All sample shipments must be accompanied by a completed, signed and dated change-of-custody record and other pertinent forms. A copy of these forms should be retained by the originator. All receipt associated with the shipment should be retained.

When transferring possession of samples, the transferee must sign and record the date and time of the chain-of-custody record. In general, custody transfers are made for each sample, although samples may be transferred as a group. Each person who takes custody must fill in the appropriate section of the chain-of-custody record.

Sample Identification:

- facility name/location
- sample site description
- sample number
- signature/initials of the collector for each sample
- date and time of collection
- indication of a grab or composite sample
- identification of the parameter to be analyzed
- preservative used
- indication of any unusual condition at the sampling location and/or in the appearance of the wastewater
- notation of conditions such as pH, temperature and appearance that may change before the laboratory analysis

Quality Control:

Duplicate samples are separate samples taken from the same source at the same time. These samples provide a check on sampling equipment and precision techniques.

Split samples are samples that have been divided into two containers for analysis by separate laboratories. These samples provide an excellent means of identifying discrepancies in the permittee's analytical techniques and procedures.

Sample preservation blanks are samples of distilled water to which a known quantity of preservative is added. They are analyzed to determine the effectiveness of the preservative, providing a check on the contamination of chemical preservatives.

Sample Parameters and Preparation:

Parameter	Container*	Preservative	Max Hold Time	Sample Volume
E.coli Bacteria	P,G			
Ammonia Nitrogen and Total Phosphorus	P,G	Cool to 39°F H2SO4 to pH<2	28 days	1,000 ml
BOD_5 (Biochemical Oxygen Demand)	P,G	Cool to 39°F	48 hours	1 liter
Total Nitrogen Nitrate-Nitrogen TSS (Total Suspended Solids)	P,G	Cool to 39°F	48 hours	1,000 ml
pH [H]				
Temperature				

**G = Glass, P = Polyethylene*

[H] Omit pH if sample is extracted in 72 hours

11.6 Employee Training

Employees responsible for permit compliance must be regularly trained or informed of any information pertinent to the proper operation and maintenance of the facility and waste disposal.

Training shall include topics such as land application of wastes, proper operation and maintenance of the facility, good housekeeping and material management practices, necessary record-keeping requirements, and spill response and clean up.

Date: _____
Topic(s) Discussed (check all that apply):
☐ Land Application ☐ Material Management ☐ Spill Response & Cleanup
☐ Facility Operation & Maintenance ☐ Good Housekeeping ☐ Recordkeeping

Employee(s) Present	**Responsibility**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Trainer: _____ **Signature:** _____

Date: _____
Topic(s) Discussed (check all that apply):
☐ Land Application ☐ Material Management ☐ Spill Response & Cleanup
☐ Facility Operation & Maintenance ☐ Good Housekeeping ☐ Recordkeeping

Employee(s) Present	**Responsibility**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Trainer: _____ **Signature:** _____

Date: _____
Topic(s) Discussed (check all that apply):
☐ Land Application ☐ Material Management ☐ Spill Response & Cleanup
☐ Facility Operation & Maintenance ☐ Good Housekeeping ☐ Recordkeeping

Employee(s) Present	**Responsibility**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Trainer: _____ **Signature:** _____

11.7 Crops and Yields

Field ID & Year	Planned Crop	Expected Yield	Actual Crop Planted	Actual Yield

11.8 Wastewater Application Calculations – Narrative Approach

	Application Calculations	Rate LMU No: ____
1	Determine nutrient component from soil (lbs-N/ac or lbs-P2O5): **Nitrogen = (lbs./ac-in from both 0-6 and 6-24 soil profiles shown on soil test), Phosphorus = (lbs./ac-in from the 0-6 soil profile shown on soil test)**	
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement = (from Planning Tools – S-Crops), For Phosphorus – Adjust for Phosphorus Index (PI). (refer to PI Sheets)**	
3	Determine remaining nutrients needed for crop requirement, (lbs-N/ac or lbs-P2O5) **= (Line 2 -Line 1)**	
4	Determine nutrient concentration from effluent (lbs-N/ac-in) **Nitrogen = (lbs./ac-in value from effluent test, Phosphorus = (lbs./ac-in P2O5 value from effluent test)**	
5	Effluent Adjustment: Determine nutrient concentration assuming an estimated % available each year. **% Available N = ((Organic * 49%) + (Ammonia N * 75%))/TN; TN per ac-in * % available = adjusted** **Phosphorus = (lbs./ac-in of P2O5 in value from effluent test) @ 100% available**	
6	Enter acreage to be irrigated, (acres)	
7	Determine volume of effluent needed to meet crop requirement, (ac-ft)* **=(Line 3 / Line 5) / 12**	
8	Conversion to total gallons **=(Line 7 x 325,851)**	
9	Conversion to acre-inches per acre **=(Line 3/ Line 5)**	

	Application Calculations	Rate LMU No: ____
1	Determine nutrient component from soil (lbs-N/ac or lbs-P2O5): **Nitrogen = (lbs./ac-in from both 0-6 and 6-24 soil profiles shown on soil test), Phosphorus = (lbs./ac-in from the 0-6 soil profile shown on soil test)**	
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement = (from Planning Tools – S-Crops), For Phosphorus – Adjust for Phosphorus Index (PI). (refer to PI Sheets)**	
3	Determine remaining nutrients needed for crop requirement, (lbs-N/ac or lbs-P2O5) **= (Line 2 -Line 1)**	
4	Determine nutrient concentration from effluent (lbs-N/ac-in) **Nitrogen = (lbs./ac-in value from effluent test, Phosphorus = (lbs./ac-in P2O5 value from effluent test)**	
5	Effluent Adjustment: Determine nutrient concentration assuming an estimated % available each year. **% Available N = ((Organic * 49%) + (Ammonia N * 75%))/TN; TN per ac-in * % available = adjusted** **Phosphorus = (lbs./ac-in of P2O5 in value from effluent test) @ 100% available**	
6	Enter acreage to be irrigated, (acres)	
7	Determine volume of effluent needed to meet crop requirement, (ac-ft)* **=(Line 3 / Line 5) / 12**	
8	Conversion to total gallons **=(Line 7 x 325,851)**	
9	Conversion to acre-inches per acre **=(Line 3/ Line 5)**	

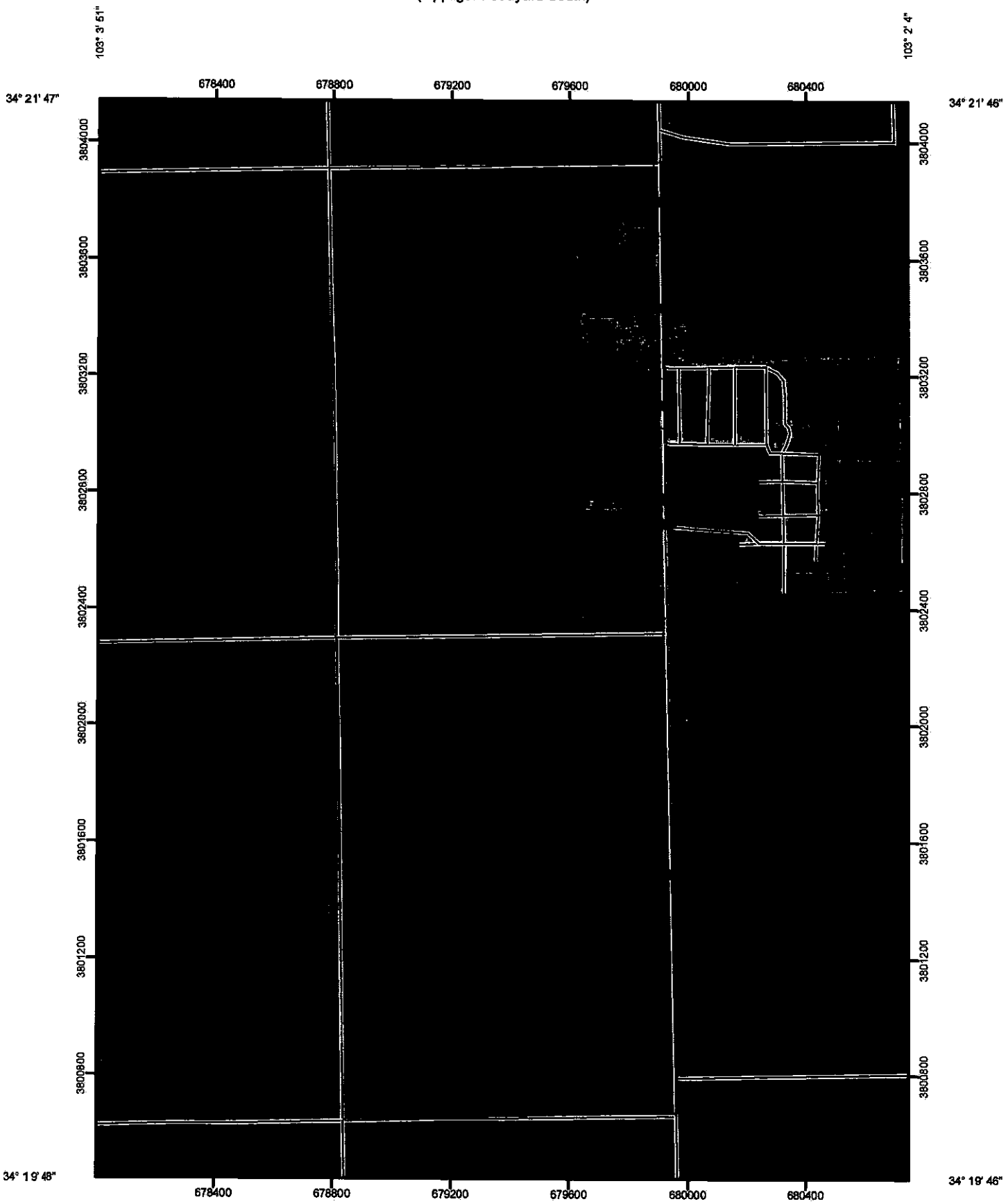
11.9 Manure Application Calculations

	Application Calculations	Rate LMU No: ____
1	Determine nutrient component from soil (lbs-N/ac or lbs-P2O5): **Nitrogen = (lbs./ac-in from both 0-6 and 6-24 soil profiles shown on soil test), Phosphorus = (lbs./ac-in from the 0-6 soil profile shown on soil test)**	
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement = (from Planning Tools – S-Crops), For Phosphorus – Adjust for Phosphorus Index (PI). (refer to PI Sheets)**	
3	Determine remaining nutrients needed for crop requirement, (lbs-N/ac) = **(Line 2 -Line 1)**	
4	Determine nutrient component from solid manure (lbs-N/ton) **Nitrogen = (lbs./ton value from manure test), Phosphorus = (lbs./ton P2O5 value from manure test)**	
5	Assume 50% of nitrogen available in first year **% Available N = ((Organic * 53%) + (Ammonia N * 75%))/TN; TN per ac-in * % available = adjusted, Phosphorus = (lbs./ac-in of P2O5 in value from effluent test) @ 100% available**	
6	Total nitrogen available in first year, (lbs-N/ton) = **(Line 4) x (Line 5)**	
7	Total nitrogen available in first year, (lbs-N/ton) = **(Result from Line 5)**	
8	Enter the amount of solid manure to be applied, (tons) = **(Line 2 / Line 5)**	
9	Number of acres the manure will be applied to, (acres)	

	Application Calculations	Rate LMU No: ____
1	Determine nutrient component from soil (lbs-N/ac or lbs-P2O5): **Nitrogen = (lbs./ac-in from both 0-6 and 6-24 soil profiles shown on soil test), Phosphorus = (lbs./ac-in from the 0-6 soil profile shown on soil test)**	
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement = (from Planning Tools – S-Crops), For Phosphorus – Adjust for Phosphorus Index (PI). (refer to PI Sheets)**	
3	Determine remaining nutrients needed for crop requirement, (lbs-N/ac) = **(Line 2 -Line 1)**	
4	Determine nutrient component from solid manure (lbs-N/ton) **Nitrogen = (lbs./ton value from manure test), Phosphorus = (lbs./ton P2O5 value from manure test)**	
5	Assume 50% of nitrogen available in first year **% Available N = ((Organic * 53%) + (Ammonia N * 75%))/TN; TN per ac-in * % available = adjusted, Phosphorus = (lbs./ac-in of P2O5 in value from effluent test) @ 100% available**	
6	Total nitrogen available in first year, (lbs-N/ton) = **(Line 4) x (Line 5)**	
7	Total nitrogen available in first year, (lbs-N/ton) = **(Result from Line 5)**	
8	Enter the amount of solid manure to be applied, (tons) = **(Line 2 / Line 5)**	
9	Number of acres the manure will be applied to, (acres)	

SECTION 12 SUPPORTING DOCUMENTATION

Soil Map—Curry County and Southwest Part of Quay County, New Mexico, and Parmer County, Texas
(Oppliger Feedyard South)



Map Scale: 1:17,600 if printed on A size (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1,000 2,000 3,000

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features

- Gully
- Short Steep Slope
- Other

Political Features

- Cities

Water Features

- Oceans
- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:17,600 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 13N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Curry County and Southwest Part of Quay County, New Mexico
Survey Area Data: Version 8, Dec 9, 2008

Soil Survey Area: Parmer County, Texas
Survey Area Data: Version 8, Oct 26, 2009

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 1/15/1996; 3/3/1996

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Curry County and Southwest Part of Quay County, New Mexico (NM669)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
AcA	Acuff loam, 0 to 1 percent slopes	124.4	13.7%
AfA	Amarillo fine sandy loam, 0 to 1 percent slopes	670.5	73.6%
AfB	Amarillo fine sandy loam, 1 to 3 percent slopes	30.2	3.3%
EsA	Estacado loam, 0 to 1 percent slopes	29.0	3.2%
PeB	Pep loam, 1 to 3 percent slopes	29.3	3.2%
RcA	Ranco clay, 0 to 1 percent slopes, frequently ponded	8.6	0.9%
Subtotals for Soil Survey Area		**892.1**	**98.0%**
Totals for Area of Interest		**910.5**	**100.0%**

Parmer County, Texas (TX369)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
AcA	Acuff loam, 0 to 1 percent slopes	1.8	0.2%
AmA	Amarillo fine sandy loam, 0 to 1 percent slopes	12.2	1.3%
AmB	Amarillo fine sandy loam, 1 to 3 percent slopes	1.0	0.1%
Ra	Randall clay	0.1	0.0%
TwC	Tulia-Potter complex, 1 to 5 percent slopes	3.4	0.4%
Subtotals for Soil Survey Area		**18.4**	**2.0%**
Totals for Area of Interest		**910.5**	**100.0%**

Map Unit Description (Brief, Generated)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief, Generated)

Curry County and Southwest Part of Quay County, New Mexico

Map Unit: AcA—Acuff loam, 0 to 1 percent slopes

Component: Acuff (90%)

The Acuff component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on tablelands, plains. The parent material consists of loamy eolian deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R077CY022TX Deep Hardland 16-21" Pz ecological site. Nonirrigated land capability classification is 4c. Irrigated land capability classification is 1 This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent.

Map Unit: AfA—Amarillo fine sandy loam, 0 to 1 percent slopes

Component: Amarillo (85%)

The Amarillo component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on tablelands, plains. The parent material consists of loamy eolian deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R077CY036TX Sandy Loam 16-21" Pz ecological site. Nonirrigated land capability classification is 4c. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 10 percent.

Map Unit: AfB—Amarillo fine sandy loam, 1 to 3 percent slopes

Component: Amarillo (85%)

The Amarillo component makes up 85 percent of the map unit. Slopes are 1 to 3 percent. This component is on tablelands, plains, playa slopes. The parent material consists of loamy eolian deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R077CY036TX Sandy Loam 16-21" Pz ecological site. Nonirrigated land capability classification is 4c. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 40 percent.

Map Unit: EsA—Estacado loam, 0 to 1 percent slopes

Component: Estacado (90%)

The Estacado component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on tablelands, plains. The parent material consists of loamy eolian deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R077CY028TX Limy Upland 16-21" Pz ecological site. Nonirrigated land capability classification is 4c. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 30 percent. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map Unit: PeB—Pep loam, 1 to 3 percent slopes

Component: Pep (90%)

The Pep component makes up 90 percent of the map unit. Slopes are 1 to 3 percent. This component is on playa slopes, plains, tablelands. The parent material consists of loamy eolian deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R077CY028TX Limy Upland 16-21" Pz ecological site. Nonirrigated land capability classification is 4c. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 33 percent.

Map Unit: RcA—Ranco clay, 0 to 1 percent slopes, frequently ponded

Component: Ranco (90%)

The Ranco component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on playa floors, tablelands. The parent material consists of clayey lacustrine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is very high. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 3 inches during May, June, September, October. Organic matter content in the surface horizon is about 1 percent. This component is in the R077CY027TX Playa 16-21" Pz ecological site. Nonirrigated land capability classification is 6w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 10 percent.

Parmer County, Texas

Map Unit: AcA—Acuff loam, 0 to 1 percent slopes

Component: Acuff (100%)

The Acuff component makes up 100 percent of the map unit. Slopes are 0 to 1 percent. This component is on plains on plateaus. The parent material consists of Loamy eolian deposits from the Blackwater Draw Formation of Pleistocene age.. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R077CY022TX Deep Hardland 16-21" Pz ecological site. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 40 percent.

Map Unit: AmA—Amarillo fine sandy loam, 0 to 1 percent slopes

Component: Amarillo (100%)

The Amarillo component makes up 100 percent of the map unit. Slopes are 0 to 1 percent. This component is on plains on plateaus. The parent material consists of Loamy eolian deposits from the Blackwater Draw Formation of Pleistocene age.. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R077CY036TX Sandy Loam 16-21" Pz ecological site. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 40 percent.

Map Unit: AmB—Amarillo fine sandy loam, 1 to 3 percent slopes

Component: Amarillo (100%)

The Amarillo component makes up 100 percent of the map unit. Slopes are 1 to 3 percent. This component is on playa slopes on plateaus, plains on plateaus. The parent material consists of Loamy eolian deposits from the Blackwater Draw Formation of Pleistocene age.. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R077CY036TX Sandy Loam 16-21" Pz ecological site. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 40 percent.

Map Unit: Ra—Randall clay

Component: Randall (70%)

The Randall component makes up 70 percent of the map unit. Slopes are 0 to 1 percent. This component is on playa floors on plateaus. The parent material consists of clayey lacustrine deposits of Quaternary age. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is very high. This soil is not flooded. It is occasionally ponded. A seasonal zone of water saturation is at 0 inches during May, June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. This component is in the R077CY027TX Playa 16-21" Pz ecological site. Nonirrigated land capability classification is 6w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 10 percent.

Component: Unnamed, minor components (30%)

Generated brief soil descriptions are created for major components. The Unnamed soil is a minor component.

Map Unit: TwC—Tulia-Potter complex, 1 to 5 percent slopes

Component: Tulia (85%)

The Tulia component makes up 85 percent of the map unit. Slopes are 1 to 5 percent. This component is on draws on plateaus, playa slopes on plateaus. The parent material consists of calcareous, loamy eolian deposits from the Blackwater Draw Formation of Pleistocene age. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R077CY028TX Limy Upland 16-21" Pz ecological site. Nonirrigated land capability classification is 4e. Irrigated land capability classification is 4e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 33 percent.

Component: Potter (15%)

The Potter component makes up 15 percent of the map unit. Slopes are 1 to 5 percent. This component is on draws on breaks, scarps on breaks. The parent material consists of calcareous, loamy alluvium in the Ogallala Formation of Miocene-Pliocene age.. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R077EY068TX Very Shallow 16-24" Pz ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 38 percent.

Data Source Information

Soil Survey Area: Curry County and Southwest Part of Quay County, New Mexico
Survey Area Data: Version 8, Dec 9, 2008

Soil Survey Area: Parmer County, Texas
Survey Area Data: Version 8, Oct 26, 2009

Selected Soil Interpretations

This report allows the customer to produce a report showing the results of the soil interpretation(s) of his or her choice. It is useful when a standard report that displays the results of the selected interpretation(s) is not available.

When customers select this report, they are presented with a list of interpretations with results for the selected map units. The customer may select up to three interpretations to be presented in table format.

For a description of the particular interpretations and their criteria, use the "Selected Survey Area Interpretation Descriptions" report.

Report—Selected Soil Interpretations

Selected Soil Interpretations– Curry County and Southwest Part of Quay County, New Mexico					
Map symbol and soil name	Pct. of map unit	Awm - Irrigation disposal of wastewater		Awm - land application of dry and slurry manure (tx)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AcA—Acuff loam, 0 to 1 percent slopes					
Acuff	90	Not limited			
AfA—Amarillo fine sandy loam, 0 to 1 percent slopes					
Amarillo	85	Somewhat limited			
		Filtering capacity	0.01		
AfB—Amarillo fine sandy loam, 1 to 3 percent slopes					
Amarillo	85	Somewhat limited			
		Filtering capacity	0.01		
EsA—Estacado loam, 0 to 1 percent slopes					
Estacado	90	Not limited			
PeB—Pep loam, 1 to 3 percent slopes					
Pep	90	Not limited			
RcA—Ranco clay, 0 to 1 percent slopes, frequently ponded					
Ranco	90	Very limited			
		Slow water movement	1.00		
		Ponding	1.00		
		Depth to saturated zone	1.00		

Selected Soil Interpretations– Parmer County, Texas					
Map symbol and soil name	Pct. of map unit	Awm - irrigation disposal of wastewater		Awm - land application of dry and slurry manure (tx)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AcA—Acuff loam, 0 to 1 percent slopes					
Acuff	100	Not limited		Not limited	
AmA—Amarillo fine sandy loam, 0 to 1 percent slopes					
Amarillo	100	Not limited		Not limited	
AmB—Amarillo fine sandy loam, 1 to 3 percent slopes					
Amarillo	100	Not limited		Not limited	
Ra—Randall clay					
Randall	70	Very limited		Very limited	
		Slow water movement	1.00	Percs slowly	1.00
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Runoff	0.50
TwC—Tulia-Potter complex, 1 to 5 percent slopes					
Tulia	85	Not limited		Not limited	
Potter	15	Somewhat limited		Somewhat limited	
		Droughty	0.86	Droughty	0.85
				Seepage	0.20

Data Source Information

Soil Survey Area: Curry County and Southwest Part of Quay County, New Mexico
Survey Area Data: Version 8, Dec 9, 2008

Soil Survey Area: Parmer County, Texas
Survey Area Data: Version 8, Oct 26, 2009

Selected Soil Interpretations

This report allows the customer to produce a report showing the results of the soil interpretation(s) of his or her choice. It is useful when a standard report that displays the results of the selected interpretation(s) is not available.

When customers select this report, they are presented with a list of interpretations with results for the selected map units. The customer may select up to three interpretations to be presented in table format.

For a description of the particular interpretations and their criteria, use the "Selected Survey Area Interpretation Descriptions" report.

Report—Selected Soil Interpretations

Selected Soil Interpretations– Curry County and Southwest Part of Quay County, New Mexico					
Map symbol and soil name	Pct. of map unit	Dhs - catastrophic mortality, large animal disposal, pit		Dhs - catastrophic mortality, large animal disposal, trench	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AcA—Acuff loam, 0 to 1 percent slopes					
Acuff	90	Somewhat limited		Somewhat limited	
		Water gathering	0.17	Water gathering	0.17
AfA—Amarillo fine sandy loam, 0 to 1 percent slopes					
Amarillo	85	Somewhat limited		Somewhat limited	
		Water gathering	0.17	Water gathering	0.17
AfB—Amarillo fine sandy loam, 1 to 3 percent slopes					
Amarillo	85	Somewhat limited		Somewhat limited	
		Water gathering	0.17	Water gathering	0.17
EsA—Estacado loam, 0 to 1 percent slopes					
Estacado	90	Somewhat limited		Somewhat limited	
		Water gathering	0.17	Water gathering	0.17
PeB—Pep loam, 1 to 3 percent slopes					
Pep	90	Somewhat limited		Somewhat limited	
		Water gathering	0.33	Water gathering	0.33

Selected Soil Interpretations– Curry County and Southwest Part of Quay County, New Mexico					
Map symbol and soil name	Pct. of map unit	Dhs - catastrophic mortality, large animal disposal, pit		Dhs - catastrophic mortality, large animal disposal, trench	
		Rating class and limiting features	Value	Rating class and limiting features	Value
RcA—Ranco clay, 0 to 1 percent slopes, frequently ponded					
Ranco	90	Very limited		Very limited	
		Wetness	1.00	Wetness	1.00
		Ponding	1.00	Ponding	1.00
		Cutbanks cave	0.50	Cutbanks cave	0.50
		Water gathering	0.50	Water gathering	0.50
		Clay content	0.50	Clay content	0.50

Selected Soil Interpretations– Parmer County, Texas					
Map symbol and soil name	Pct. of map unit	Dhs - catastrophic mortality, large animal disposal, pit		Dhs - catastrophic mortality, large animal disposal, trench	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AcA—Acuff loam, 0 to 1 percent slopes					
Acuff	100	Somewhat limited		Somewhat limited	
		Water gathering surface	0.10	Water gathering surface	0.10
AmA—Amarillo fine sandy loam, 0 to 1 percent slopes					
Amarillo	100	Somewhat limited		Somewhat limited	
		Water gathering surface	0.10	Water gathering surface	0.10
		Clay content	0.01	Clay content	0.01
AmB—Amarillo fine sandy loam, 1 to 3 percent slopes					
Amarillo	100	Somewhat limited		Somewhat limited	
		Water gathering surface	0.10	Water gathering surface	0.10
		Clay content	0.01	Clay content	0.01
Ra—Randall clay					
Randall	70	Very limited		Very limited	
		Wetness	1.00	Wetness	1.00
		Ponding	1.00	Ponding	1.00
		Unstable excavation walls	0.50	Unstable excavation walls	0.50
		Water gathering surface	0.50	Water gathering surface	0.50
		Clay content	0.50	Clay content	0.50

Selected Soil Interpretations– Parmer County, Texas					
Map symbol and soil name	Pct. of map unit	Dhs - catastrophic mortality, large animal disposal, pit		Dhs - catastrophic mortality, large animal disposal, trench	
		Rating class and limiting features	Value	Rating class and limiting features	Value
TwC—Tulia-Potter complex, 1 to 5 percent slopes					
Tulia	85	Somewhat limited		Somewhat limited	
		Water gathering surface	0.20	Water gathering surface	0.20
Potter	15	Somewhat limited		Somewhat limited	
		Water gathering surface	0.03	Water gathering surface	0.03
		Large stones	0.01	Large stones	0.01

Data Source Information

Soil Survey Area: Curry County and Southwest Part of Quay County, New Mexico
Survey Area Data: Version 8, Dec 9, 2008

Soil Survey Area: Parmer County, Texas
Survey Area Data: Version 8, Oct 26, 2009

RUSLE2 Related Attributes

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factors Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the surface horizon.

Report—RUSLE2 Related Attributes

RUSLE2 Related Attributes– Curry County and Southwest Part of Quay County, New Mexico							
Map symbol and soil name	Pct. of map unit	Hydrologic group	Kf	T factor	Representative value		
					% Sand	% Silt	% Clay
AcA—Acuff loam, 0 to 1 percent slopes							
Acuff	90	B	.37	5	42.1	37.9	20.0
AfA—Amarillo fine sandy loam, 0 to 1 percent slopes							
Amarillo	85	B	.28	5	69.6	16.4	14.0
AfB—Amarillo fine sandy loam, 1 to 3 percent slopes							
Amarillo	85	B	.28	5	69.6	16.4	14.0
EsA—Estacado loam, 0 to 1 percent slopes							
Estacado	90	B	.37	5	39.8	37.7	22.5
PeB—Pep loam, 1 to 3 percent slopes							
Pep	90	C	.37	5	42.1	37.9	20.0
RcA—Ranco clay, 0 to 1 percent slopes, frequently ponded							
Ranco	90	D	.20	5	26.1	28.9	45.0

RUSLE2 Related Attributes– Parmer County, Texas							
Map symbol and soil name	Pct. of map unit	Hydrologic group	Kf	T factor	Representative value		
					% Sand	% Silt	% Clay
AcA—Acuff loam, 0 to 1 percent slopes							
Acuff	100	B	.28	5	41.4	37.1	21.5
AmA—Amarillo fine sandy loam, 0 to 1 percent slopes							
Amarillo	100	B	.24	5	66.1	19.9	14.0
AmB—Amarillo fine sandy loam, 1 to 3 percent slopes							
Amarillo	100	B	.24	5	66.1	19.9	14.0

RUSLE2 Related Attributes--Parmer County, Texas							
Map symbol and soil name	Pct. of map unit	Hydrologic group	Kf	T factor	Representative value		
					% Sand	% Silt	% Clay
Ra—Randall clay							
Randall	70	D	.32	5	17.1	27.9	55.0
TwC—Tulia-Potter complex, 1 to 5 percent slopes							
Tulia	85	B	.24	3	64.5	19.5	16.0
Potter	15	B	.32	1	37.9	35.6	26.5

Data Source Information

Soil Survey Area: Curry County and Southwest Part of Quay County, New Mexico
Survey Area Data: Version 8, Dec 9, 2008

Soil Survey Area: Parmer County, Texas
Survey Area Data: Version 8, Oct 26, 2009

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Report—Physical Soil Properties

Physical Soil Properties– Curry County and Southwest Part of Quay County, New Mexico														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
AcA—Acuff loam, 0 to 1 percent slopes														
Acuff	0-7	30-42-50	30-38-45	15-20-25	1.30-1.55	4.23-14.11	0.14-0.16	0.0-2.9	1.0-2.0	.37	.37	5	6	48
	7-33	30-34-70	10-37-45	25-30-35	1.40-1.65	4.23-14.11	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32			
	33-57	30-34-70	10-37-45	25-30-35	1.40-1.65	4.23-14.11	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32			
	57-80	25-35-50	25-38-45	20-28-35	1.40-1.65	4.23-14.11	0.16-0.18	0.0-2.9	0.0-0.2	.32	.32			
AfA—Amarillo fine sandy loam, 0 to 1 percent slopes														
Amarillo	0-9	55-70-75	5-16-25	10-14-18	1.35-1.55	14.11-42.34	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	9-42	40-55-70	5-17-35	20-28-35	1.30-1.60	4.23-14.11	0.16-0.18	0.0-2.9	0.2-0.7	.32	.32			
	42-80	30-34-45	25-37-45	15-30-32	1.35-1.55	4.23-14.11	0.13-0.15	0.0-2.9	0.1-0.3	.37	.37			
AfB—Amarillo fine sandy loam, 1 to 3 percent slopes														
Amarillo	0-10	55-70-75	5-16-25	10-14-18	1.35-1.55	14.11-42.34	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	10-35	40-55-70	5-17-35	20-28-35	1.30-1.60	4.23-14.11	0.16-0.18	0.0-2.9	0.2-0.7	.32	.32			
	35-80	25-63-70	10-14-40	20-23-35	1.40-1.65	4.00-14.00	0.10-0.16	0.0-2.9	0.1-0.5	.32	.32			

Physical Soil Properties– Curry County and Southwest Part of Quay County, New Mexico														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
EsA—Estacado loam, 0 to 1 percent slopes														
Estacado	0-11	30-40- 50	30-38- 50	18-23- 27	1.30-1.45	4.23-14.11	0.14-0.16	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	11-20	25-35- 40	25-34- 40	27-31- 35	1.35-1.50	4.23-14.11	0.18-0.20	0.0-2.9	1.0-3.0	.32	.32			
	20-80	25-35- 40	25-34- 40	27-31- 35	1.35-1.60	4.23-14.11	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
PeB—Pep loam, 1 to 3 percent slopes														
Pep	0-14	35-42- 50	25-38- 45	15-20- 25	1.25-1.40	4.23-14.11	0.14-0.16	0.0-2.9	1.0-2.0	.37	.37	5	4L	86
	14-30	25-39- 45	5-37- 45	20-25- 35	1.40-1.50	4.23-14.11	0.15-0.17	0.0-2.9	0.1-1.0	.37	.37			
	30-80	25-35- 40	25-34- 45	27-31- 35	1.40-1.55	4.23-14.10	0.18-0.20	3.0-5.9	0.1-0.5	.32	.32			
RcA—Ranco clay, 0 to 1 percent slopes, frequently ponded														
Ranco	0-5	15-26- 35	15-29- 35	40-45- 50	1.20-1.40	0.01-0.42	0.12-0.18	9.0-25.0	0.5-2.0	.20	.20	5	7	38
	5-12	15-26- 35	20-29- 45	40-45- 50	1.25-1.40	0.01-0.42	0.12-0.18	9.0-25.0	0.5-1.0	.20	.20			
	12-80	15-26- 35	25-29- 45	40-45- 50	1.30-1.45	0.01-0.42	0.11-0.15	9.0-25.0	0.1-0.5	.20	.20			

Physical Soil Properties–Parmer County, Texas														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
AcA—Acuff loam, 0 to 1 percent slopes														
Acuff	0-10	-41-	-37-	13-22-30	1.30-1.55	4.00-14.00	0.12-0.18	0.0-2.9	1.0-2.0	.28	.28	5	6	48
	10-36	-56-	-15-	25-30-35	1.40-1.65	4.00-14.00	0.14-0.19	0.0-2.9	0.5-1.0	.32	.32			
	36-80	-55-	-17-	20-28-35	1.35-1.65	4.00-14.00	0.10-0.16	0.0-2.9	0.5-1.0	.32	.32			
AmA—Amarillo fine sandy loam, 0 to 1 percent slopes														
Amarillo	0-11	-66-	-20-	10-14-18	1.35-1.60	14.00-42.00	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	11-38	-55-	-17-	20-28-35	1.30-1.65	4.00-14.00	0.14-0.18	0.0-2.9	0.1-0.5	.32	.32			
	38-66	-55-	-17-	20-28-35	1.40-1.80	4.00-14.00	0.10-0.15	0.0-2.9	0.1-0.5	.32	.32			
AmB—Amarillo fine sandy loam, 1 to 3 percent slopes														
Amarillo	0-11	-66-	-20-	10-14-18	1.35-1.60	14.00-42.00	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	11-38	-55-	-17-	20-28-35	1.30-1.65	4.00-14.00	0.14-0.18	0.0-2.9	0.1-0.5	.32	.32			
	38-66	-55-	-17-	20-28-35	1.40-1.80	4.00-14.00	0.10-0.15	0.0-2.9	0.1-0.5	.32	.32			
Ra—Randall clay														
Randall	0-6	-17-	-28-	50-55-60	1.20-1.40	0.01-0.42	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32	5	7	38
	6-32	-17-	-28-	50-55-60	1.25-1.40	0.01-0.42	0.12-0.18	9.0-25.0	0.1-1.0	.32	.32			
	32-80	-17-	-28-	50-55-60	1.30-1.45	0.42-1.40	0.11-0.15	9.0-25.0	0.1-0.5	.32	.32			

Physical Soil Properties– Parmer County, Texas														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
TwC—Tulia-Potter complex, 1 to 5 percent slopes														
Tulia	0-17	-65-	-20-	12-16- 20	1.35-1.55	14.00-42.00	0.10-0.14	0.0-2.9	0.5-1.0	.24	.24	3	3	86
	17-63	-34-	-37-	20-30- 40	1.35-1.55	4.00-14.00	0.07-0.15	3.0-5.9	0.1-0.5	.28	.32			
	63-80	-34-	-37-	20-30- 40	1.45-1.65	4.00-14.00	0.10-0.16	3.0-5.9	0.1-0.5	.28	.32			
Potter	0-12	-38-	-36-	18-27- 35	1.35-1.55	4.00-14.00	0.12-0.16	0.0-2.9	0.5-1.0	.28	.32	1	4L	86
	12-64	-42-	-37-	15-21- 27	1.40-1.65	4.00-42.00	0.01-0.06	0.0-2.9	0.1-0.5	.10	.32			

Data Source Information

Soil Survey Area: Curry County and Southwest Part of Quay County, New Mexico
Survey Area Data: Version 8, Dec 9, 2008

Soil Survey Area: Parmer County, Texas
Survey Area Data: Version 8, Oct 26, 2009

ENVIRO-AG EAE ENGINEERING, INC.

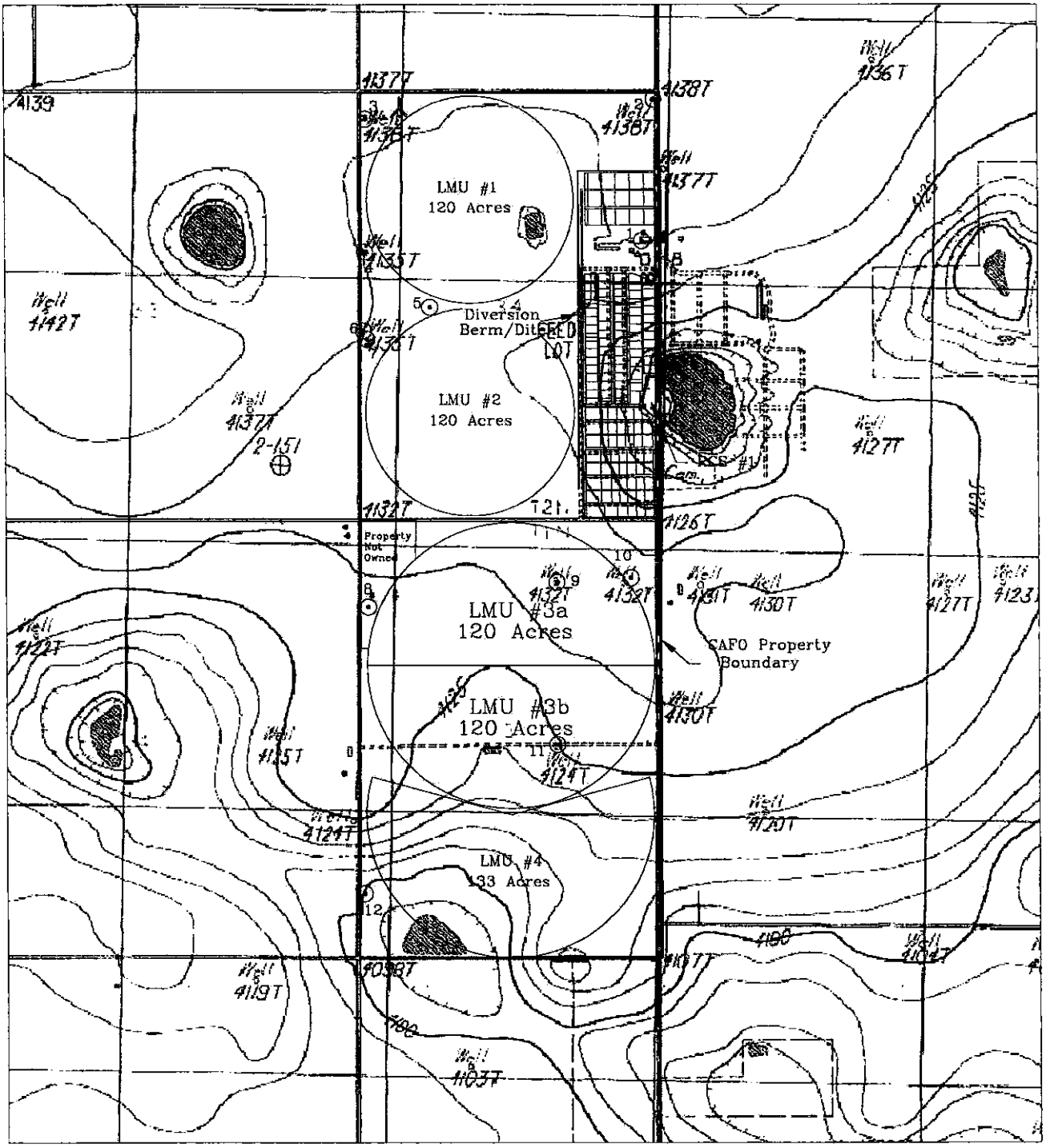
WATER WELLS
SETBACKS OR COMPLIANCE ALTERNATIVES
Oppliger Feedyard (South)
Curry County, New Mexico

Enviro-Ag Engineering, Inc. (EAE) have identified existing water wells located on the property which do not meet the specified land application setback requirements for well heads. As a compliance alternative, the following table demonstrates conservation practices or field-specific conditions will provide pollutant reductions equivalent or better than the reductions that would be achieved by the 100-foot setback:

Table 1: Water Well Information

Map Number	BMPs
1	1.) Well located up gradient of feedyard pens and land application. 2.) Well includes a concrete surface slab. 3.) Maintain surface gradients sloping away from the wellhead outside the concrete foundation to prevent the ponding of effluent in the proximity to the well. 4.) Each wellhead will be observed on regular intervals.
2	1.) Well located up gradient of feedyard pens and land application. 2.) Well includes a concrete surface slab. 3.) Maintain surface gradients sloping away from the wellhead outside the concrete foundation to prevent the ponding of effluent in the proximity to the well. 4.) Each wellhead will be observed on regular intervals.
3	Maintain 100-ft setback.
4	Maintain 100-ft setback.
5	1.) Well located outside the pivot. 2.) Well includes a concrete surface slab. 3.) Maintain surface gradients sloping away from the wellhead outside the concrete foundation to prevent the ponding of effluent in the proximity to the well. 4.) Each wellhead will be observed on regular intervals.
6	Maintain 100-ft setback or properly plug well.
7	Maintain 100-ft setback.

Map Number	BMPs
8	Maintain 100-ft setback.
9	1.) Well will be covered with a protective structure/shield to prevent direct contact between the effluent and the wellhead. 2.) Well includes a concrete surface slab. 3.) Maintain surface gradients sloping away from the wellhead outside the concrete foundation to prevent the ponding of effluent in the proximity to the well. 4.) Each wellhead will be observed on regular intervals.
10	1.) Well will be covered with a protective structure/shield to prevent direct contact between the effluent and the wellhead. 2.) Well includes a concrete surface slab. 3.) Maintain surface gradients sloping away from the wellhead outside the concrete foundation to prevent the ponding of effluent in the proximity to the well. 4.) Each wellhead will be observed on regular intervals.
11	1.) Well will be covered with a protective structure/shield to prevent direct contact between the effluent and the wellhead. 2.) Well includes a concrete surface slab. 3.) Maintain surface gradients sloping away from the wellhead outside the concrete foundation to prevent the ponding of effluent in the proximity to the well. 4.) Each wellhead will be observed on regular intervals.
12	Maintain 100-ft setback.



Legend:

- ⊙ Denotes Well with Buffer and/orBMPs
- ⌀ Denotes Non-Visible Water Well
- Denotes Wind Turbine

Source: TOPO! Software, National Geographic Seamless Topographic Maps on CD-Rom, 2001. Pleasure Lake, NM TX, 1980

N
W E
S

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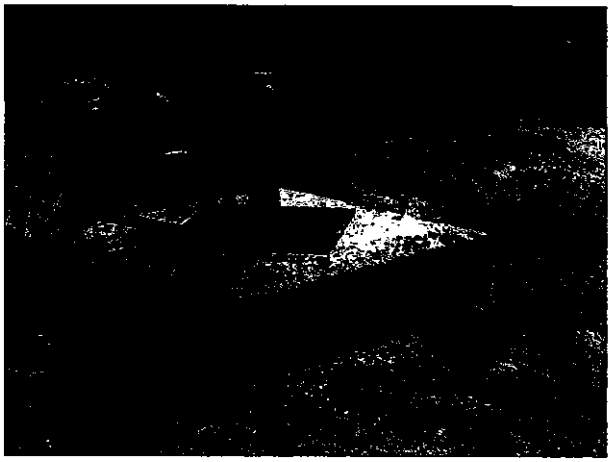
SCALE

Oppliger Feedyard South Farwell Curry County, NM	Well Map	ENVIRO-AG EAE ENGINEERING, INC. Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 3404 Airway Boulevard AMARILLO, TEXAS 79118 TEL (806) 353-6123 FAX (806) 353-4132

Well #5



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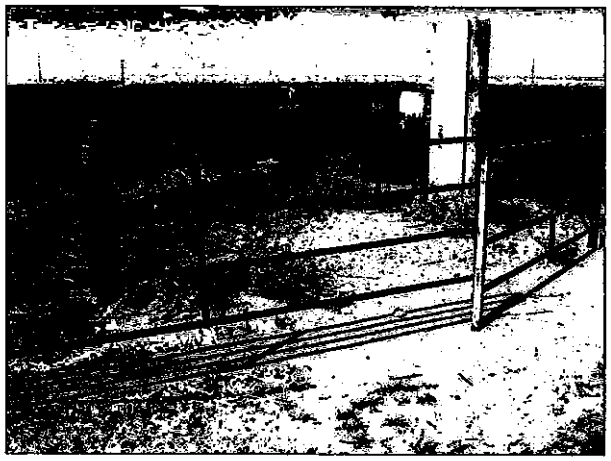
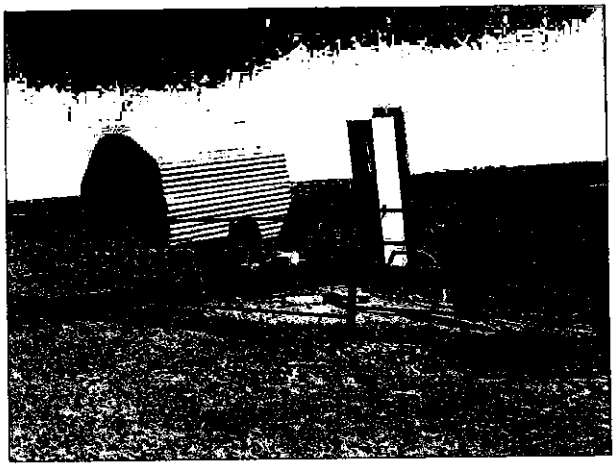


Well #9

Well #9

Well #10

Well #10



Well #11

Well #11