12.5 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

12.6 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:** _____

12.7 Crops and Yields

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

12.8 Wastewater 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 0-12 and 12-36 soil profiles shown on soil test), Phosphorus = (lbs./ac-in from the 0-12 soil profile shown on soil test)**	
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement = (Nitrogen & Phosphorus Crop Requirements/Uptakes from Crop Requirement tables utilized by the Texas NRCS Code 590), 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 0-12 and 12-36 soil profiles shown on soil test), Phosphorus = (lbs./ac-in from the 0-12 soil profile shown on soil test)**	
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement = (Nitrogen & Phosphorus Crop Requirements/Uptakes from Crop Requirement tables utilized by the Texas NRCS Code 590), 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)**	

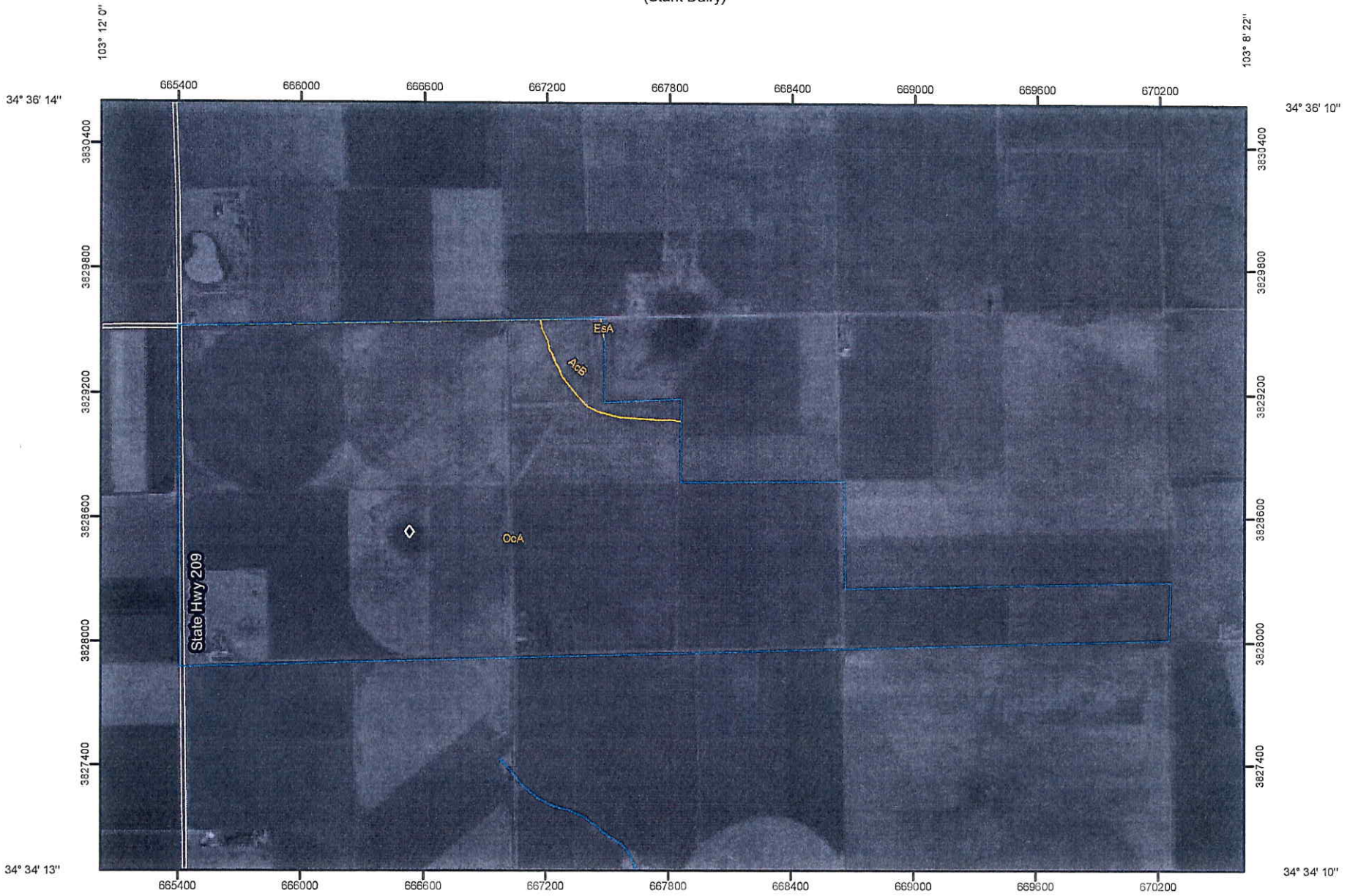
12.9 Manure Application Calculations

	Application Calculations	Rate LMU No: ____
1	Determine nutrient component from soil (lbs-N/ac or lbs-P2O5): **Nitrogen = (lbs./ac-in from both 0-12 and 12-36 soil profiles shown on soil test)** **Phosphorus = (lbs./ac-in from the 0-12 soil profile shown on soil test) (ppm*4 inches=lbs/ac)**	
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement/Uptake = (Nitrogen & Phosphorus Crop Requirements/Uptakes from Crop Requirement tables utilized by the Texas NRCS Code 590) 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	% of Nitrogen available **% 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	Enter the amount of solid manure to be applied, (tons/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 0-12 and 12-36 soil profiles shown on soil test)** **Phosphorus = (lbs./ac-in from the 0-12 soil profile shown on soil test) (ppm*4 inches=lbs/ac)**	
2	Determine annual nutrient requirement from cropping scheme, (lbs-N/ac or lbs-P2O5) **Crop Requirement/Uptake = (Nitrogen & Phosphorus Crop Requirements/Uptakes from Crop Requirement tables utilized by the Texas NRCS Code 590) 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	% of Nitrogen available **% 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	Enter the amount of solid manure to be applied, (tons/acre) = **(Line 3) / (Line 5)**	

SECTION 13 SUPPORTING DOCUMENTATION

Soil Map—Curry County and Southwest Part of Quay County, New Mexico
(Stark Dairy)



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: 1:26,500 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

Date(s) aerial images were photographed: 3/3/1997

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
AcB	Acuff loam, 1 to 3 percent slopes	31.7	2.6%
EsA	Estacado loam, 0 to 1 percent slopes	0.3	0.0%
OcA	Olton clay loam, 0 to 1 percent slopes	1,199.0	97.4%
Totals for Area of Interest		**1,231.0**	**100.0%**

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
AcB—Acuff loam, 1 to 3 percent slopes							
Acuff	90	B	.37	5	42.1	37.9	20.0
EsA—Estacado loam, 0 to 1 percent slopes							
Estacado	90	B	.37	5	39.8	37.7	22.5
OcA—Olton clay loam, 0 to 1 percent slopes							
Olton	95	C	.32	5	34.8	33.2	32.0

Data Source Information

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

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*					
AcB—Acuff loam, 1 to 3 percent slopes														
Acuff	0-7	30-50	30-45	15-25	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	25-65	25-40	25-35	1.40-1.65	4.23-14.11	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32			
	33-80	25-50	25-45	20-35	1.40-1.65	4.23-14.11	0.16-0.18	0.0-2.9	0.0-0.2	.32	.32			
EsA—Estacado loam, 0 to 1 percent slopes														
Estacado	0-11	30-50	30-50	18-27	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	25-40	25-40	27-35	1.35-1.50	4.23-14.11	0.18-0.20	0.0-2.9	1.0-3.0	.32	.32			
	20-80	25-40	25-40	27-35	1.35-1.60	4.23-14.11	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
OcA—Olton clay loam, 0 to 1 percent slopes														
Olton	0-6	25-45	30-45	25-38	1.25-1.45	4.23-14.11	0.14-0.16	3.0-5.9	1.0-2.0	.32	.32	5	6	48
	6-17	15-40	20-40	35-45	1.25-1.45	1.41-4.23	0.18-0.20	3.0-5.9	0.0-0.4	.32	.32			
	17-41	25-45	20-40	30-40	1.35-1.50	1.41-4.23	0.18-0.20	3.0-5.9	0.0-0.2	.32	.32			
	41-80	25-45	30-45	25-35	1.35-1.50	1.41-4.23	0.18-0.20	3.0-5.9	0.0-0.2	.32	.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

Map Unit Description

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.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series.* All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas.* Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

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

Report—Map Unit Description

Curry County and Southwest Part of Quay County, New Mexico

AcB—Acuff loam, 1 to 3 percent slopes

Map Unit Setting

Elevation: 4,100 to 5,300 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 180 to 200 days

Map Unit Composition

Acuff and similar soils: 90 percent

Description of Acuff

Setting

Landform: Plains, playa slopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy eolian deposits

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability (nonirrigated): 4c
Ecological site: Deep Hardland 16-21" PZ (R077CY022TX)

Typical profile

0 to 7 inches: Loam
7 to 33 inches: Clay loam
33 to 80 inches: Clay loam

EsA—Estacado loam, 0 to 1 percent slopes

Map Unit Setting

Elevation: 4,100 to 5,300 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 180 to 200 days

Map Unit Composition

Estacado and similar soils: 90 percent

Description of Estacado

Setting

Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy eolian deposits

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water capacity: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability (nonirrigated): 4c
Ecological site: Limy Upland 16-21" PZ (R077CY028TX)

Typical profile

0 to 11 inches: Loam
11 to 20 inches: Clay loam
20 to 80 inches: Clay loam

OcA—Olton clay loam, 0 to 1 percent slopes

Map Unit Setting

Elevation: 4,100 to 5,300 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 180 to 200 days

Map Unit Composition

Olton and similar soils: 95 percent

Description of Olton

Setting

Landform: Plains
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Loamy eolian deposits

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: High (about 11.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability (nonirrigated): 4c
Ecological site: Deep Hardland 16-21" PZ (R077CY022TX)

Typical profile

0 to 6 inches: Clay loam
6 to 17 inches: Clay
17 to 41 inches: Clay loam
41 to 80 inches: Clay loam

Data Source Information

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

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 - manure and food processing waste	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AcB—Acuff loam, 1 to 3 percent slopes					
Acuff	90	Not limited		Not limited	
EsA—Estacado loam, 0 to 1 percent slopes					
Estacado	90	Not limited		Not limited	
OcA—Olton clay loam, 0 to 1 percent slopes					
Olton	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.31	Slow water movement	0.41

Data Source Information

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

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
AcB—Acuff loam, 1 to 3 percent slopes					
Acuff	90	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
OcA—Olton clay loam, 0 to 1 percent slopes					
Olton	95	Somewhat limited		Somewhat limited	
		Water gathering	0.33	Water gathering	0.33
		Clay content	0.14	Clay content	0.14

Data Source Information

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

ENVIRO-AG
EAE
ENGINEERING, INC.

WATER WELLS
SETBACKS OR COMPLIANCE ALTERNATIVES
Stark Dairy
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	Maintain 100-ft setback from land application events.
2	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.
3	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.
4	Maintain 100-ft setback from land application events.
5	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. 5.) or Properly plug well.

Map Number	BMPs
6	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.
7	1.) Well located up gradient of dairy 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.
8	Maintain 100-ft setback from land application events.
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.
Monitor Wells	1.) Wells located outside pivot irrigation systems. 2.) Wells include concrete surface slabs. 3.) Each wellhead will be observed on regular intervals.

Well #2

Well #2

Well #3

Well #3

Well #5

Typical view of Monitoring Wells.

Well #6

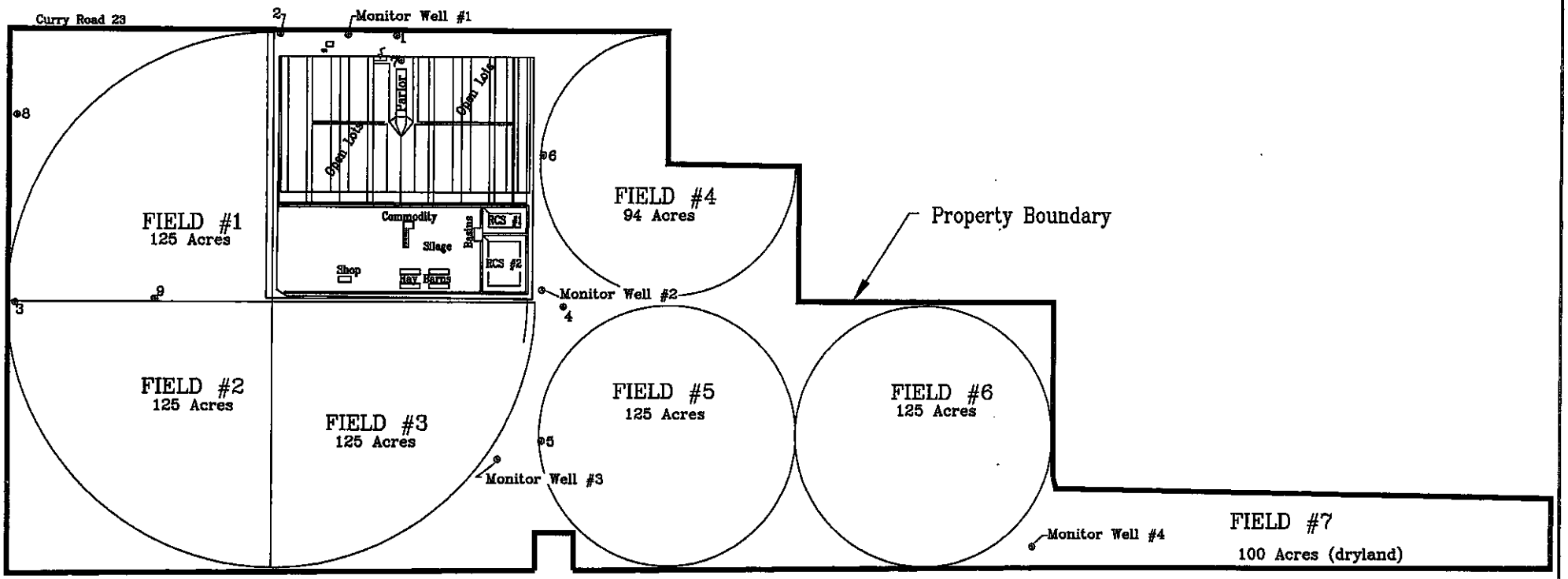
Well #6

Well #8

Well #11

Well #9

Well #9



Stark Dairy Clovis Curry County, New Mexico	Site Map	ENVIRO-AG ENGINEERING, INC. Enviro-Ag Engineering, In ENGINEERING CONSULTANTS 3404 Airway Boulevard AMARILLO, TEXAS 79118 TEL (806) 353-6123 FAX (806) 353-4132