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

Prepared for:
Stark Dairy
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Clovis, NM 88101
Curry County, NM

Prepared By:

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Stark Dairy
Curry County, New Mexico

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SECTION 1 NOTICE OF INTENT

Form Approved
OMB No. 2040-0250

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

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: Stark & Sons Dairy Telephone: (575) 985-0192 Address: 949 CR 23 Facsimile: (575) 985-0194 City: Clovis State: NM Zip Code: 88101	☒ 1. Existing Facility ☐ 2. Proposed Facility

D. FACILITY INFORMATION

Name: Stark and Sons Dairy Telephone: (575) 985-0192
Address: 949 CR 23 Facsimile: (575) 985-0194
City: Clovis State: NM Zip Code: 88101
County: Curry Latitude: 34.5932 Longitude: -103.1835

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	8,500 total	
☐ Dairy Heifers		
☐ Veal Calves		
☐ Cattle (not dairy or veal)		
☐ 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? 21681 tons 43mm 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? 819 acres

3) How many tons of manure or litter, or gallons of waste-water produced by the CAFO will be transferred annually to other persons? tons/gallons (*circle one*) 21681 tons

☐ Chickens (Broilers)		
☐ Chickens (Layers)		
☐ Ducks		
☒ Other Specify _____	Mature total includes	young stock animals
3. TOTAL ANIMALS	8,500	

C. ☒ TOPOGRAPHIC MAP

D. TYPE OF CONTAINMENT, STORAGE AND CAPACITY

1. Type of Containment	Total Capacity (in gallons)
☒ Lagoon	North - 10,085,088.45
☒ Holding Pond	South - 28,850,847.54
☐ Evaporation Pond	
☐ Other: Specify _____	

2. Report the total number of acres contributing drainage: 133 acres

3. Type of Storage	Total Number of Days	Total Capacity (gallons/tons)
☒ Anaerobic Lagoon	n/a	North - 10,085,088.45
☒ Storage Lagoon	90	South - 28,850,847.54
☐ 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:
Manure transfer

Form Approved
OMB No. 2040-0250

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.				B. Indicate the total number of ponds, raceways, and similar structures in your facility.		
1. Outfall No.	2. Flow (*gallons per day*)			1. Ponds	2. Raceways	3. Other
	a. Maximum Daily	b. Maximum 30 Day	c. Long Term Average	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. (575) 985-0192
Mike Stark, Owner	
C. Signature Mike Stark	D. Date Signed 5-21-10

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: Stark and Sons Dairy
Address: 949 County Road 23, Clovis, NM 88101
County: Curry

1.2 Facility Information

Physical Location: 949 County Road 23, Clovis, NM
Latitude: 34.5932
Longitude: -103.1835

Maximum Capacity: 8,500 total head
Milking Head: 3,500 head
Others*: 5,000 head
*Includes dry cows and/or young stock heifers and calves.

1.3 Nature of Business Producing Waste

Concentrated Animal Feeding Operation (CAFO): Dairy
SIC No.: 0241

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)	Treatment Volume (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)
North			25.52	3.62		29.14	30.95	10,085,088
South	42.03	30.18		6.36	6.12	84.69	88.54	28,850,855

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.

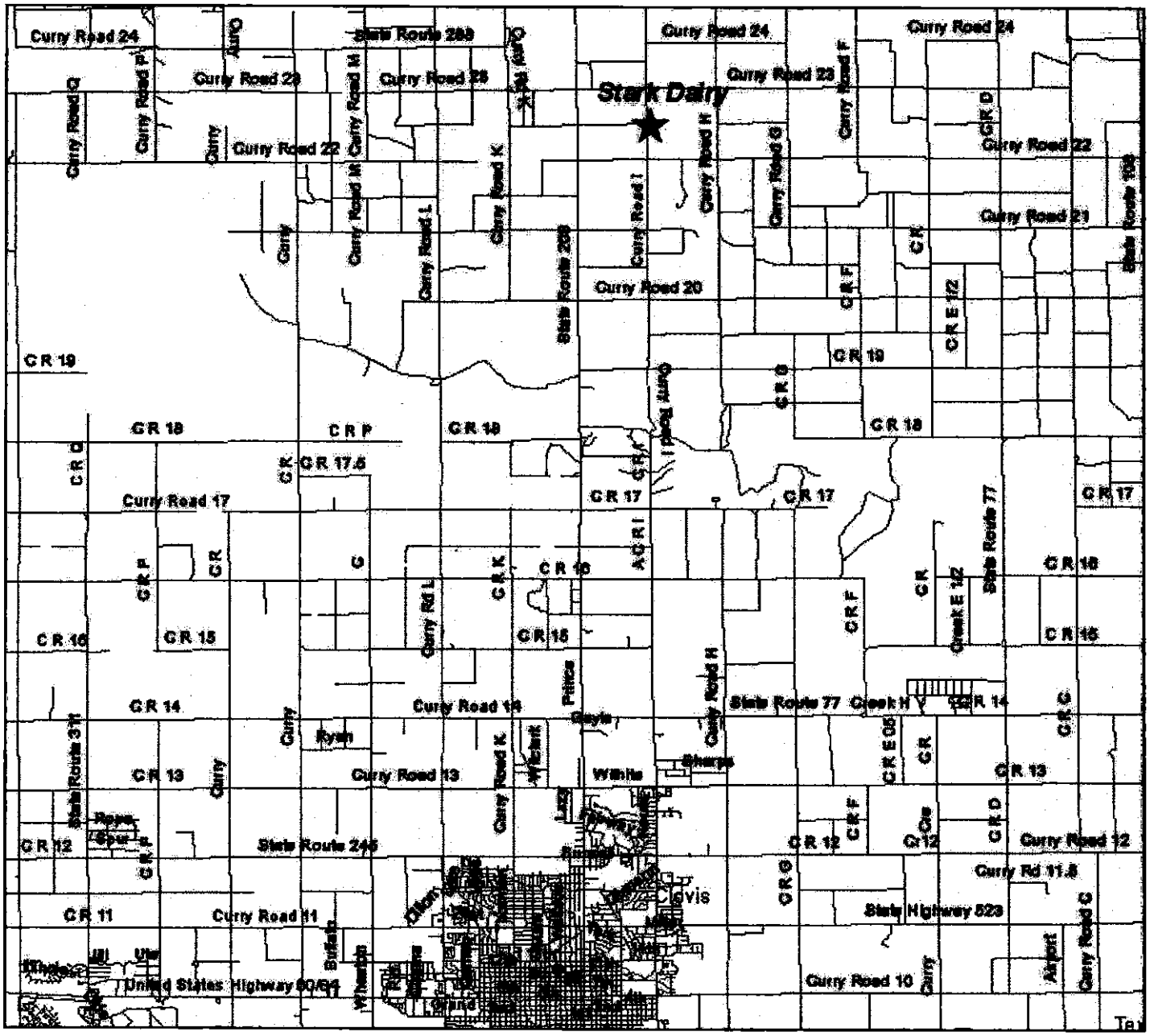
Figure 2.2 – USGS 7.5-Minute Quadrangle Map
Figure 2.2, entitled USGS 7.5-Minute Quadrangle Map is a seamless, high-quality copy of the 7.5-minute USGS quadrangle map (Ned Houk Park, New Mexico, quadrangle), that depicts the boundaries of land owned, operated, or controlled by Stark Dairy and used as 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:

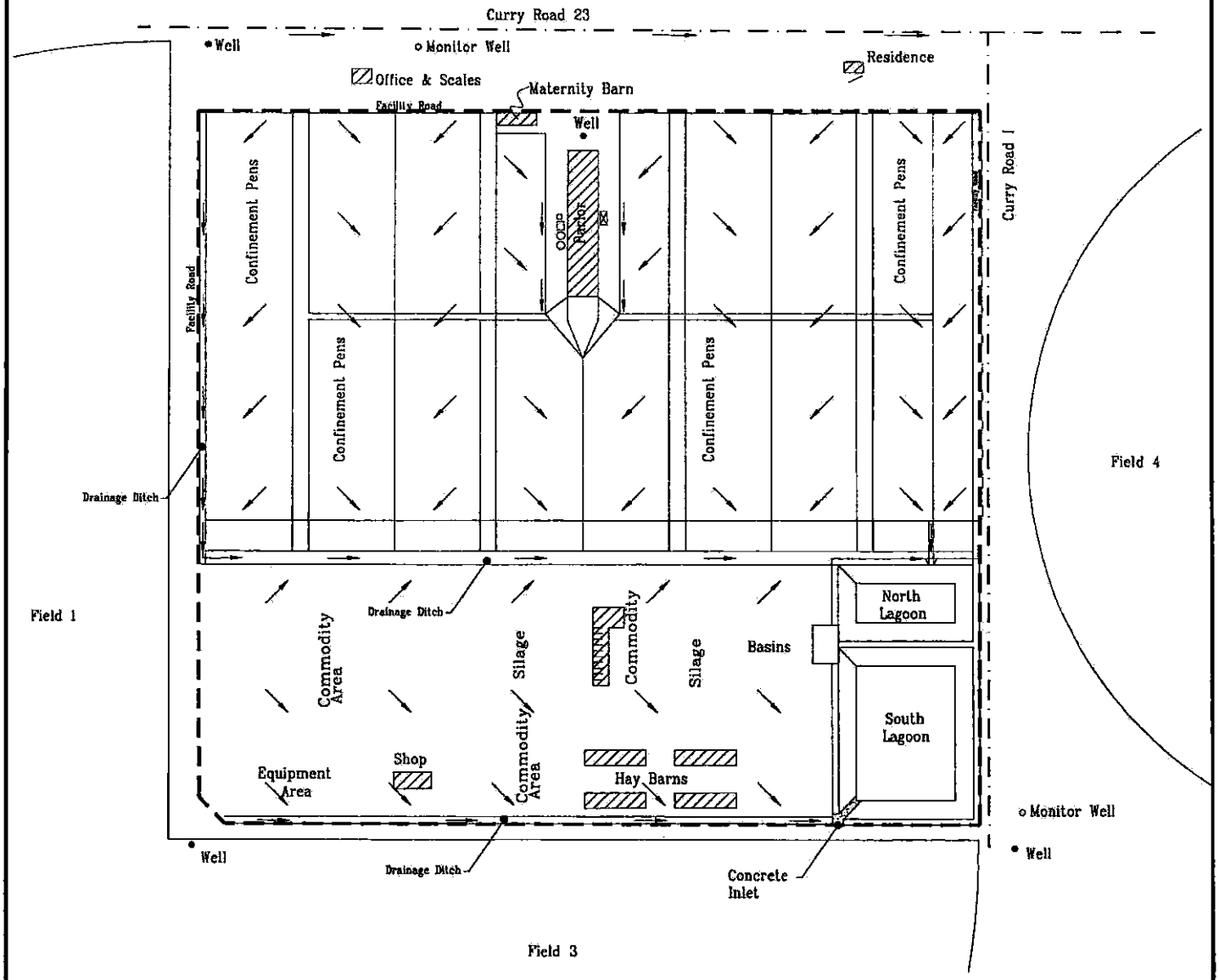
- Location of the facility and associated waste retention structures, and all land application sites
- The site plan will be maintained in the on-site PPP and updated on an as-needed basis.

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



Stark Dairy Clovis, NM Curry County	Vicinity Map Figure 2.1	ENVIRO-AG ENGINEERING, INC. Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 3404 Airway Blvd Amarillo, Texas 79118 806-353-6123; FAX 806-353-4132

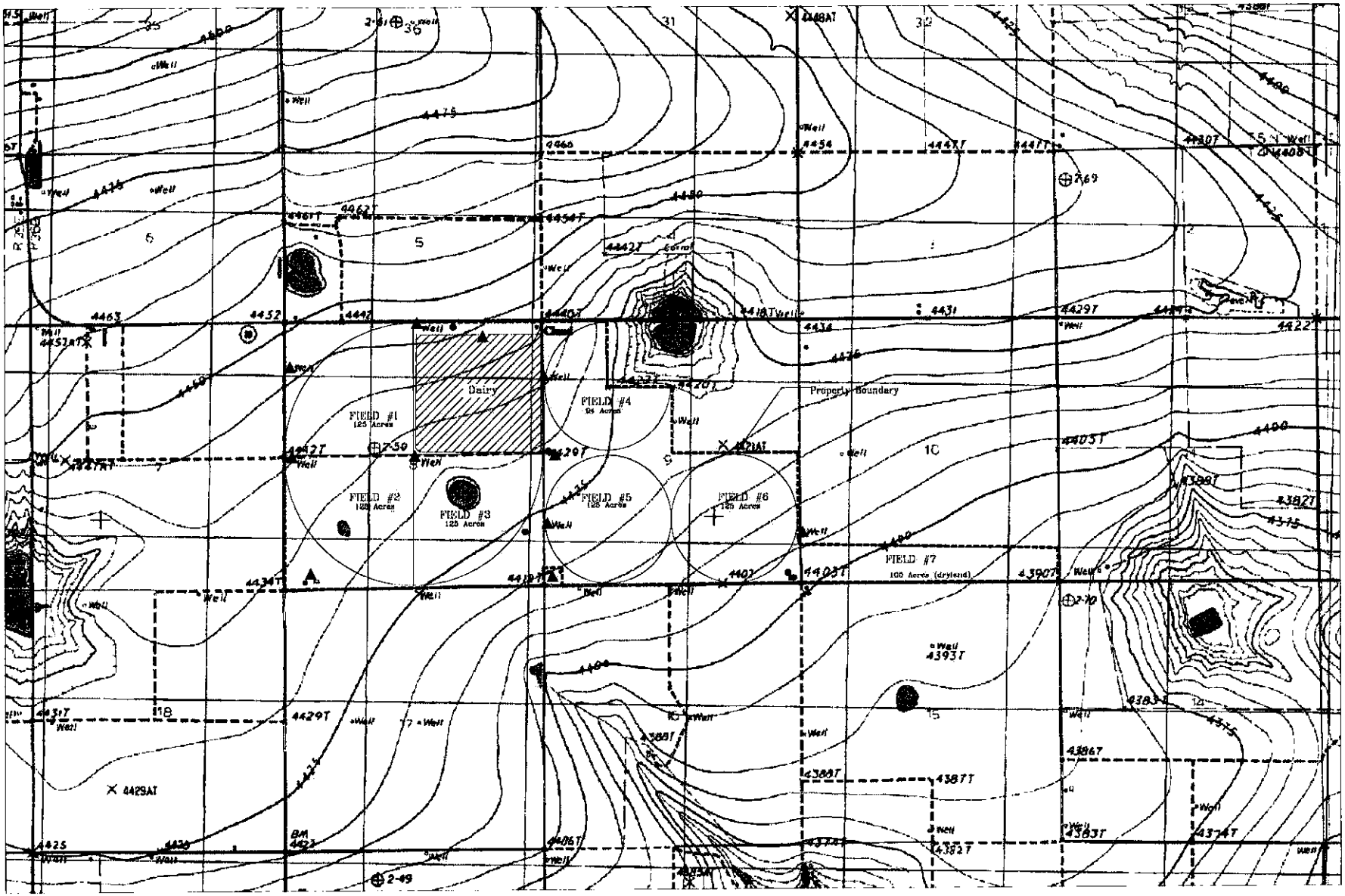


Legend:
- – – Denotes County Road
- – – Denotes Drainage Area
- —► Denotes Flow Path

N
W E
S

NO SCALE

Stark Dairy Curry County New Mexico	Site Map Figure 2.3 Page 6 - 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



Legend:

- ▲ Denotes Water Well
- ● Denotes Monitor Well

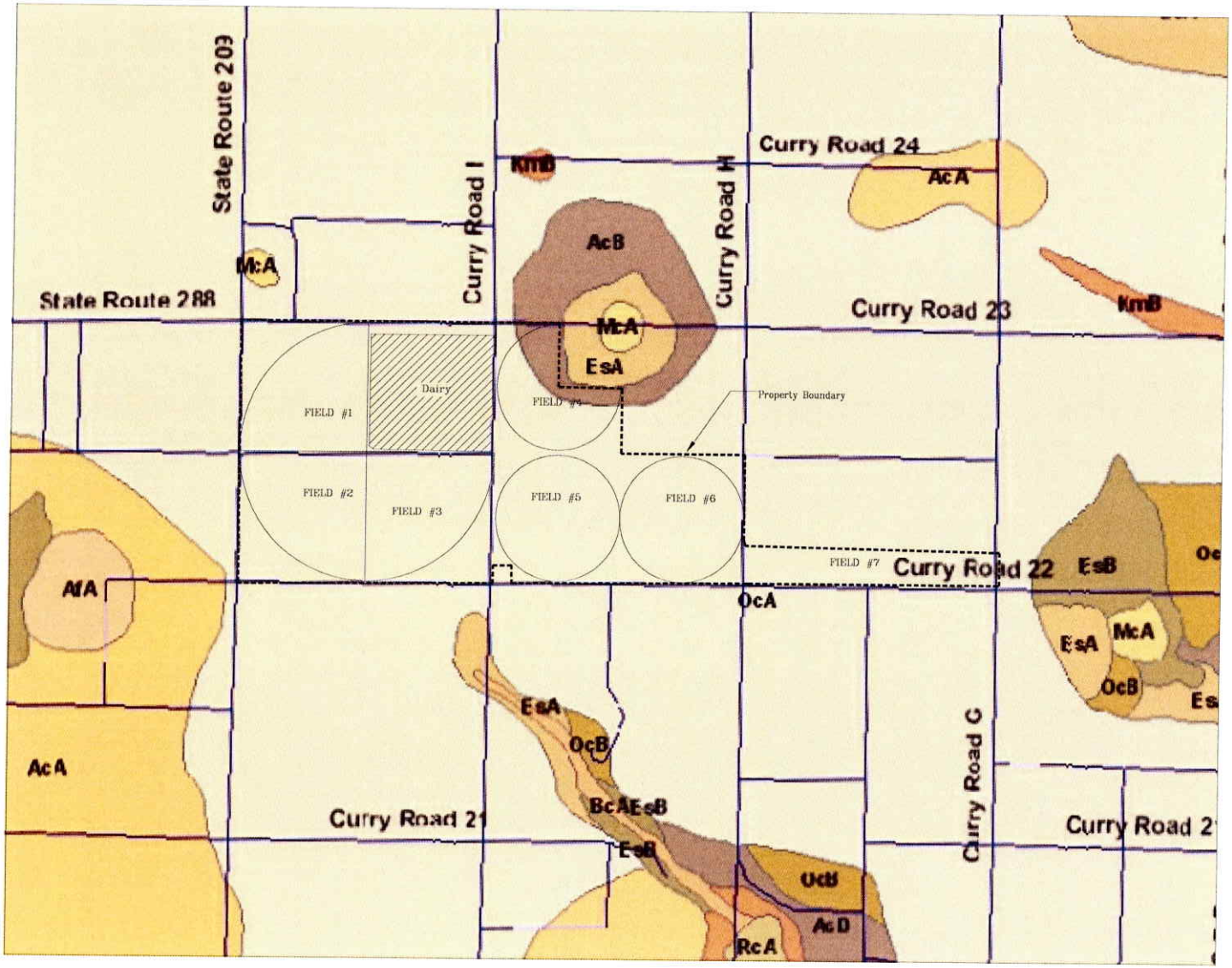
1/4 MI 0 1/4 MI 1/2 MI

SCALE

(Scale based on USGS Map)

Source: TOPO! Software, National Geographic Seamless Topographic Maps on CD ROM, 2001. Ned Houk Park, NM, Quadrangle, 1980.

Stark Dairy Curry County New Mexico	USGS 7.5-Minute Quadrangle Map Figure 2.2 Page 5	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



Legend:

AcA – Acuff loam, 0 to 1% slopes
AcB – Acuff loam, 1 to 3% slopes
BcA – Bippus clay loam, 0 to 2% slopes
EsA – Estacado loam, 0 to 1% slopes
EsB – Estacado loam, 1 to 3% slopes
KmB – Kimberson gravelly loam, 0 to 3% slopes
McA – McLean clay, 0 to 1% slopes
OcA – Olton clay loam, 0 to 1% slopes

Refer to supporting documentation for soil description information.

N
W E
S

1/4 MI 0 1/4 MI 1/2 MI
SCALE

Source: Soil Data Mart. Available at: http://soildatamart.nrcs.usda.gov/ Curry County, NM Soils Accessed 24 October 2007. Tiger Roads, Available at: http://arcdata.esri.com/data/tiger2000/tiger_statelayer.cfm?sfips=35 Curry County, NM Roads Accessed 8 March 2002.

Stark Dairy Curry County New Mexico	NRCS Soils Map Figure 2.4 Page 7	ENVIRO-AG ENGINEERING, INC. Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 3404 Airway Boulevard AMARILLO, TEXAS 79118 TEL (806) 353-6123 FAX (806) 353-4132

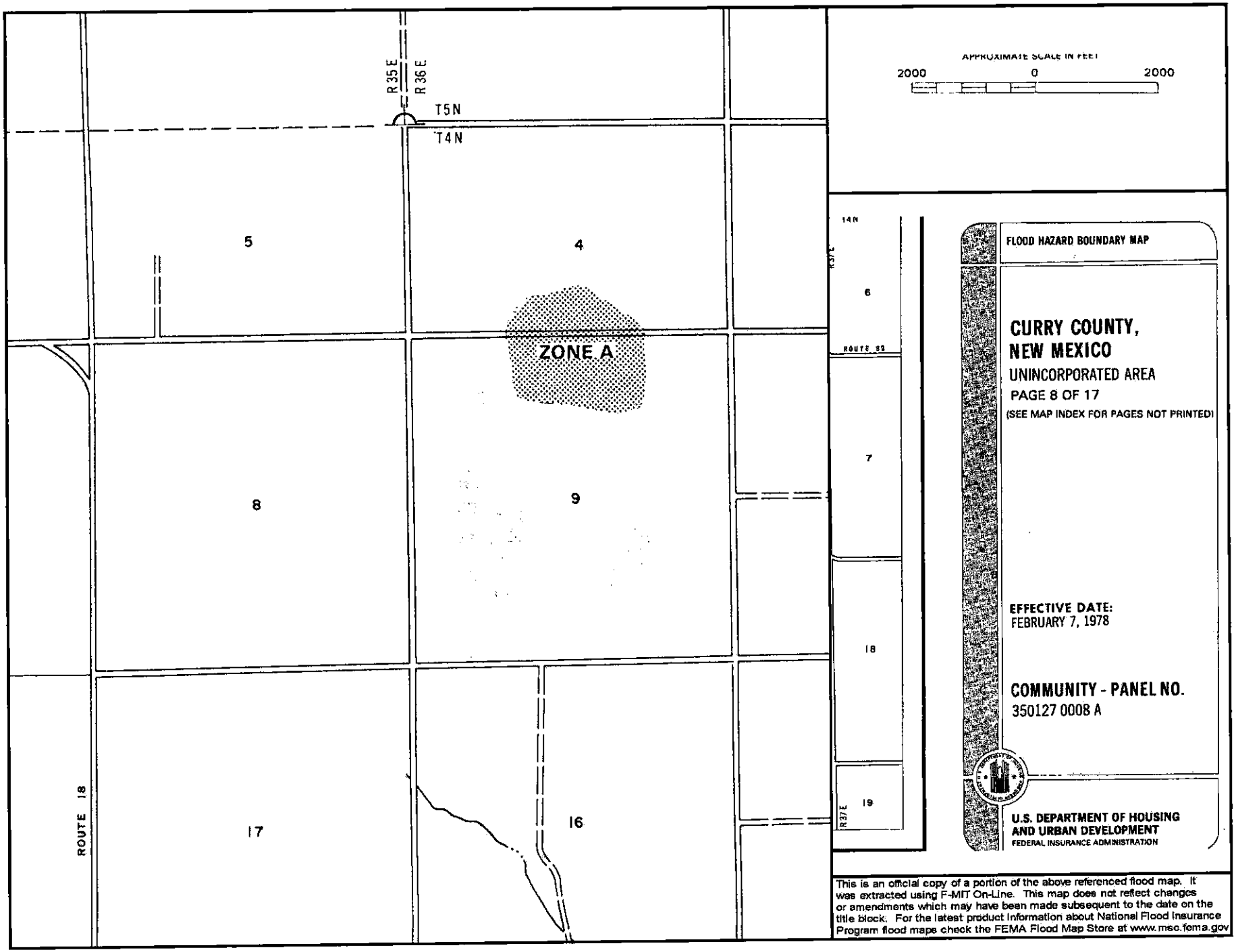


Figure 2.5 Flood Hazard Boundary Map

SECTION 3 PRODUCTION AREA

3.1 Storage of Manure and Process Wastewater

The CAFO will ensure adequate storage of manure, litter, and process wastewater, 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 dairy.

3.1.1 Manure Production

The manure and nutrient production for the dairy was calculated using ASABE Standards (ASAE D384.1, June 1988, Table 2). The estimated manure production data is included as a summary of the annual manure and nutrient production for the facility. The totals 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 dairy facility has two sources of process generated wastewater in the form of wash water from the milking parlor operations and trough overflow during the winter months. All open lot pen manure is dry scraped. The volume of process wastewater generated daily is estimated to be 30 gallons per head, which includes the wet manure production. The design storage volume for process generated wastewater is 90 days.

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 4.5 inches of rainfall.

3.1.4 Sludge Accumulation Volume

Settling basins are used to reduce the amount of solids entering the ponds, thereby reducing the demand for sludge storage. An estimated sludge accumulation volume for RCS #2 (south) was calculated to be 25% of the 25-year, 24-hour storm volume from the open lot pen area. The sludge volume calculated for RCS #1 (north) includes the sludge accumulation from the manure produced in the parlor calculated using an accumulation rate of 0.0729 cubic feet of sludge per pound total solids (taken from USDA-NRCS Agricultural Waste Management Handbook).

3.1.5 Treatment Volume Requirement

RCS #1 was designed and is operated to minimize odors. The treatment volume is determined by estimating the volatile solids production rate and a loading rate specified by ASABE Standards (ASAE EP403.3 FEB04) of 4.5 lbs of volatile solids per 1,000 cubic feet of storage.

3.1.6 Water Balance Model

The water balance model considers inflows and withdrawals to the RCS, including rainfall runoff, direct rainfall, process generated wastewater, evaporation, and irrigation demand.

3.1.7 Facility Certifications

The retention ponds have 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	
☐	Channels	
☑	Diversion Ditches	Drainage ditches and elevated roads on the west, east and south sides of the dairy directs runoff from the dairy facility to the ponds and fresh water away from the ponds.
☐	Natural Topography	
☑	Other (specify)	County Road 23 is located along the north side of the dairy complex. This road directs clean water away from the runoff ponds.

Revised 5/9/11

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.

- 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.

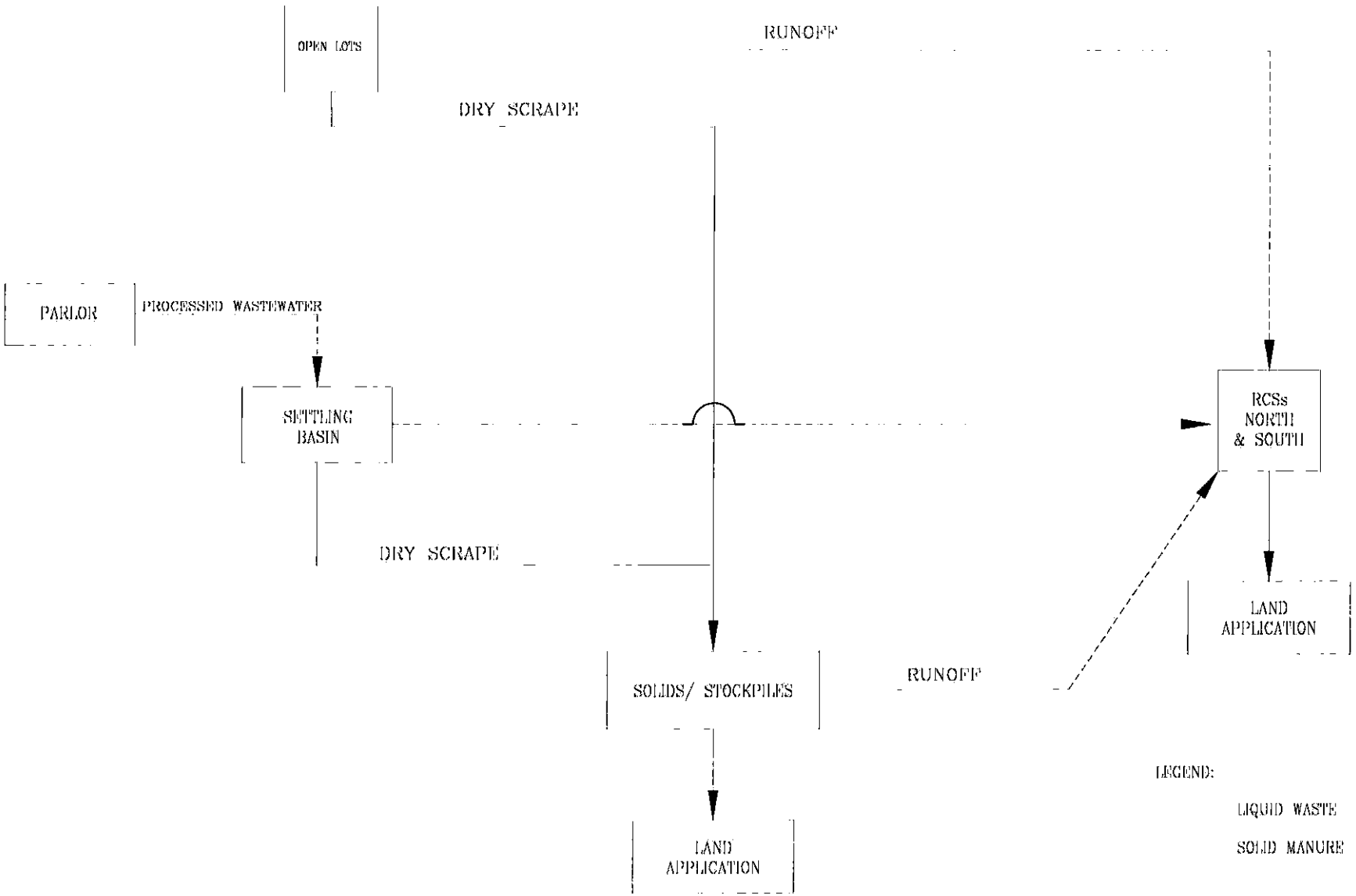
3.5 Chemical and other Contaminant Handling

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 or treatment 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? In Parlor or Maintenance Shop
- ☑ 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 regs.
- ☐ No chemicals are used at this facility.
- ☐ Other: _____



Stark Dairy Curry County New Mexico	Manure & Wastewater Flow Chart Figure 3.1 Page 13	ENVIRO-AG ENGINEERING, INC. Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 3404 Airway Boulevard AMARILLO, TEXAS 79118 TEL (806) 353-6123 FAX (806) 353-4132

REQUIRED STORAGE VOLUME FOR RUNOFF RETENTION CONTROL STRUCTURES

Table 8.1

Facility Name: **Pipkin Corporation - Site #2 (East)**
Location: **Curry County, New Mexico**
Date: **Sept. 2002**
Revised 12/11/02

Treatment Volume

Volatile Solids Production

Volatile Solids Production (#VS/day):	6,609	
Separator Efficiency (%):	24.3%	
Adjusted Volatile Solids Production (#VS/day):	5,003	
Volatile Solids Loading Rate (#VS/day/1000cu-ft): (b)	4.5	
Minimum Design Volume	1,111,760	cu-ft
	25.52	ac-ft

Sludge Accumulation

Dry Manure Production (#/day):	7,350	
Separator Efficiency (%): (a)	19.4%	
Adjusted Dry Manure Production (#/day):	5,924	
Sludge Accumulation Rate (cu-ft/#): (c)	0.0729	
Sludge Accumulation Time (years):	1	
Sludge Accumulation Volume	157,631	cu-ft
	3.62	ac-ft
Minimum Treatment Pond Volume:	**29.14**	**ac-ft**

NOTES: (a) Efficiency taken from AgPro, Separator Manufacturer.

(b) Loading Rate taken from Figure 2, 2001 ASAE Standard EP403.3.

(c) Sludge Accumulation Rate taken from Table 10-4, USDA-NRCS Agricultural Waste Management Field Handbook

(d) Using SCS method: $S = (1000/CN) - 10$

$Q = ((I - 0.2S)^2)/(I + 0.8S)$

Where: S = Potential maximum retention after runoff begins(in)

Q = Runoff (in)

I = 25-year, 24-Hour rainfall (in)

CN = Curve Number from SCS 210-VI-TR-55, 2nd Edition, June 1986

(e) Sludge: 25% of the rainfall runoff volume from the pen area

(f) Trough overflow is estimated at 0.5 gal/head/day based on 8,500 total head during winter months (Nov. - Mar.).

(g) 25-year, 24-hour rainfall event from Figure 10B-2 (see supporting documentation).

Runoff/Storage Volume

Process Generated Water Storage and Rainfall Runoff Storage:

Parlor wash down water (gal/head/day):	30
Number of Head in parlor:	3,500
Volume of Process Water (gal/day):	105,000
Trough Overflow during winter months (f) (gal/day):	4,250
Total Volume of Process Water (gal/day):	109,250
Number of Days of Storage:	90
Storage Volume for Process Water (gal)	9,832,500
(acre-feet)	30.18

Rainfall Runoff Characteristics	CN	Acres
Pen Area (acres):	90	90.00
Adjacent Areas (acres):	85	25.00
Roofed Areas (acres):	100	8.00
Total Surface Area of Runoff Structures:	100	10.00

25-Yr, 24-Hr Rainfall Event (g): 4.50 inches

Volume Determination(d)	Runoff (inches)	Runoff Volumes (ac-ft)
Pen Area	3.40	25.47
Adjacent Areas	2.91	6.06
Roofed Areas	4.50	3.00
Treatment Pond	4.50	3.75
Runoff/Storage Pond	4.50	3.75
	Required Rainfall Runoff Volume:	42.03

Design Volume Summary

Process Water Storage (ac-ft):	30.18
Rainfall Runoff Storage (ac-ft):	42.03
Runoff Sludge Accumulation (e) (ac-ft):	9.99
Additional Volume from Water Balance (ac-ft)(Table 8.2):	6.12
Minimum Treatment Volume (ac-ft):	25.52
Total Storage Capacity (ac-ft)*:	**113.83**

WATER BALANCE MODEL FOR RETENTION POND
IRRIGATION AND EVAPORATION

Table 8.2

Facility Name: Pipkin Corporation - Site #2 (East)
Location: Carry County, New Mexico
Date: Sept. 2002
Revised 12/11/02

DRAINAGE AREA DATA		
Drainage Area of Pen/Open Lot (acres):	90.0	
Drainage Area of Adjacent Land (acres):	25.0	
Drainage Area of Roofed Areas (acres):	8.0	
Surface Area of Ponds (acres):	10.0	
Dryland and Irrigated Area (acres):	375	547
Cropping scheme:	Corn	Wheat
Effective Evaporation Surface Area (Acres)(85% of SA)	8.50	

RCS VOLUME SUMMARY DATA	
25-Year, 24-Hour Rainfall Volume (ac-ft):	42.03
Sludge Accumulation Volume (ac-ft):	9.99
Process Generated Wastewater Volume (ac-ft):	30.18
Additional Volume (ac-ft):	6.12
Runoff/Storage Pond Capacity (ac-ft):	113.83
Pan Evaporation Coefficient (14):	67.9

	RCS INFLOW CALCULATIONS					HYDRAULIC CROP DEMAND CALCULATIONS						RCS STORAGE SUMMARY			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(8)	(9)	(9)	(10)	(11)	(12)	(13)
MONTH	Average Precipitation (inches)	Runoff from Pen/Open Lot (inches)	Runoff from Adj. Land (inches)	Other Inflow (ac-ft)	Total Inflow (ac-ft)	Runoff from Irrig. Area (inches)	Effect. Rainfall on Irrig. Area (inches)	Consumptive Use Corn (inches)	Consumptive Use Small Grains (inches)	Net Crop Demand Corn (ac-ft)	Net Crop Demand Small Grains (ac-ft)	Gross Evaporation (inches)	Net Pond Evaporation (ac-ft)	Actual Withdrawal (ac-ft)	Storage at End-of-Month (ac-ft)
JAN	0.34	0.00	0.00	10.39	10.90	0.00	0.34	0.00	0.00	0.00	0.00	2.88	1.65	start value ----> 0.00	28.86
FEB	0.37	0.00	0.00	9.39	9.94	0.00	0.37	0.00	0.00	0.00	0.00	2.88	1.78	0.00	38.11
MAR	0.63	0.00	0.00	10.39	11.34	0.00	0.63	0.00	2.70	0.00	94.36	4.64	2.86	44.77	9.99
APR	0.84	0.01	0.00	9.67	10.97	0.00	0.84	1.80	4.50	30.00	166.84	6.08	3.75	7.22	9.99
MAY	2.06	0.38	0.04	9.99	15.99	0.00	2.06	3.72	5.58	51.89	160.47	7.11	4.38	11.61	9.99
JUN	2.40	0.55	0.09	9.67	17.61	0.02	2.38	7.20	2.10	150.48	0.00	8.02	4.94	12.67	9.99
JUL	2.93	0.86	0.23	9.99	21.34	0.08	2.85	8.68	0.00	182.16	0.00	8.18	5.04	16.29	9.99
AUG	2.89	0.84	0.21	9.99	21.06	0.07	2.82	7.44	1.55	144.46	0.00	6.68	4.12	16.94	9.99
SEP	1.84	0.28	0.01	9.67	14.54	0.00	1.84	4.50	2.40	83.13	25.53	5.32	3.28	11.26	9.99
OCT	1.60	0.18	0.00	9.99	13.76	0.00	1.60	0.00	1.86	0.00	11.85	4.05	2.49	11.27	9.99
NOV	0.51	0.00	0.00	10.06	10.82	0.00	0.51	0.00	0.00	0.00	0.00	2.77	1.70	0.00	19.10
DEC	0.50	0.00	0.00	10.39	11.14	0.00	0.50	0.00	0.00	0.00	0.00	2.25	1.39	0.00	28.86
TOTALS	16.91	3.10	0.59	119.59	169.43	0.17	16.74	33.34	20.69	642.11	459.04	60.65	37.40	132.03	

NOTES:

(1) Average precipitation taken from the Western Regional Climate Center for Clovis 13 N, NM (1929-2001).

(2) Runoff from pen/open lot 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) Runoff from adjacent land 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)

(4) Other Inflow is calculated from process generated wastewater (Table 8.1): estimated as 30 gal/head/day from the parlor, cooling sprinklers and manure removal and 0.5 gal/head/day for trough overflow (winter months).

(5) Total Inflow is calculated as that volume of runoff from all areas of the RCS drainage area and process water that enters the RCS.

(6) Runoff from irrigated 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)

(7) Effective monthly rainfall on the irrigated area is taken as the difference between Column (6) and Column (1).

(8) Consumptive Use values taken from crops on irrigated land. (Ref. NRCS CNMP Refresher Course on CD_ROM / CU Values, August 2002)

(9) Net Crop Demand = ((Consumptive Use(8) - Effective Rainfall(7))/12) x Irrigated Area.

(10) 70 % of Average PAN Evaporation taken from the Western Regional Climate Center for Clovis 13 N, NM (1929-2000).

(11) Net Evaporation from the RCS is taken as (Gross Evap x Pan Evap Coeff/78)/12 x (RCS Surface Area).

(12) Actual Withdrawal from the RCS not to exceed Net Crop Demand. (No consideration given for nutrient demand of crop)

(13) Storage volume in the RCS 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.

(14) Pan Evaporation Coefficient taken from SCS Technical Note, Subject: Hydrology, No. 210-18-TX3, March 1983, Figure 2.

Brad Wieck, PE
12/12/02

ESTIMATED MANURE PRODUCTION DATA FOR A DAIRY FACILITY

Table 8.3

Facility Name: **Pipkin Corporation - Site #2 (East)**

Location: **Curry County, New Mexico**

Date: **Sept. 2002**

MANURE PRODUCTION CRITERIA	CONTAINMENT DESCRIPTION			TOTAL
	Parlor-Milkers	Open Lot-Milkers	Open Lot *	
	3,500	**3,500**	**5,000**	**8,500**
2. Average Liveweight per head, lbs.	1400	1400	1000	
3. Total Liveweight, lbs.	4,900,000	4,900,000	5,000,000	
4. Confinement period, hrs/hd/day	3	21	24	
5. Percent of time in Confinement Area	12.5%	87.5%	100.0%	
6. Adjusted Total Liveweight, lbs.	612,500	4,287,500	5,000,000	9,900,000
7. Wet Manure Production, lbs/day (a)	52,675	N/A	N/A	52,675
8. Dry Manure Production, lbs/day (a)	7,350	51,450	60,000	118,800
9. Dry Manure Production, tons/year	1,341	9,390	10,950	21,681
10. Volatile Solids Production, lbs/day (a)	6,609	N/A	N/A	6,609
11. Total Nitrogen Production, lbs/day (a)	275.6	1,929.4	2,250.0	4,455
12. Total Phosphorus, P2O5 lbs/day (a,b)	130.7	914.9	1,066.9	2,112

NOTES:

* - Open lots: dry cows and/or young stock(heifers & calves)

(a) - Manure and nutrient production values are taken from American Society of Agricultural Engineers Data: ASAE D384.1 "Manure Production and Characteristics"; Table 2, revised June 1988.

(b) - The ASAE Manure Production and Characteristics Tables give Phosphorus in the elemental forms. It is converted to P2O5 by multiplying the given table by 2.27.

ENVIRO-AG
EAE
ENGINEERING, INC.

STARK DAIRY
Clovis, New Mexico

Soil Liner Certification for Wastewater Ponds

The wastewater ponds at Stark Dairy were lined with 18 inches of in-situ clay materials in 3 six-inch lifts. Two Shelby tube core samples were collected from the north pond and two from the south pond to document that the installed soil liner meets the requirements of the NMED. All of the core samples were collected by Enviro-Ag Engineering, Inc. The core samples were analyzed for permeability by Dyess-Peterson Laboratory of Amarillo, Texas. Results of the permeability analysis are shown below:

North Pond

NW Bottom:	5.36×10^{-8} cm/sec
Sideslope:	5.53×10^{-8} cm/sec

South Pond

NW Bottom:	5.15×10^{-8} cm/sec
SE Bottom:	6.23×10^{-8} cm/sec

The following reports are attached to this certification:
- Permeability test results provided by Dyess-Peterson Testing.
- An estimation of specific discharge through the soil liner based on the measured thickness of the soil liner, the permeability of the soil liner and the depth of water in the pond.
- Geotechnical testing reports provided by Lydick Engineers & Surveyors of the soil material prior to installation (Particle Size Analysis, Atterberg Report and Proctor Report).
- Geotechnical testing reports provided by Lydick Engineers & Surveyors of the installed soil liner (moisture and density tests).

The installed soil liner moisture/density tests indicate that compaction was excellent during installation while some of the moisture content test results were below optimum. Based on the final in-place permeability test results, it appears that the installed clay liner meets the requirements set forth by the NMED for clay liners.

Respectfully Submitted,

BRAD J. WIECK
NEW MEXICO
14900
REGISTERED PROFESSIONAL ENGINEER

Brad J. Wieck, PE

12/10/2003

Brad J. Wieck, P.E.
Enviro-Ag Engineering, Inc.

702 QUAIL CREEK DRIVE • AMARILLO, TEXAS 79124 • TEL (806) 353-6123 • FAX (806) 353-4132
www.enviroagengineers.com

Dyess-Peterson Testing Permeability Reports
Enviro-Ag Engineering, Inc. Specific Discharge Calculations

PERMEABILITY TEST REPORT

TEST DATA:
Specimen Height (cm): 12.70
Specimen Diameter (cm): 6.79
Dry Unit Weight (pcf): 104.5
Moisture Before Test (%): 17.0
Moisture After Test (%): 22.2

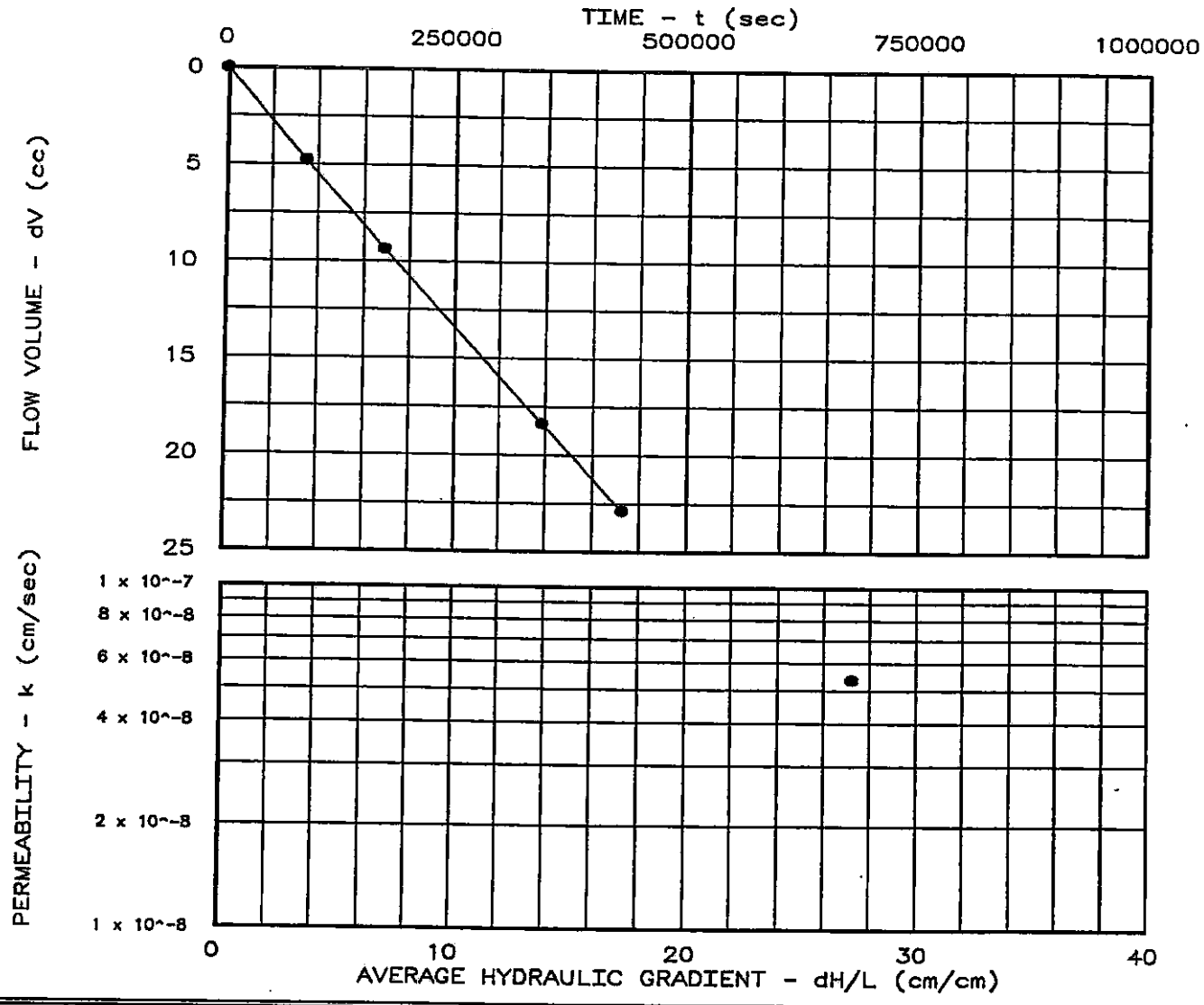
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	50.0	
Test Pressure(psi):	49.8	
Back Pressure(psi):	44.9	
Diff. Head (psi):	4.9	
Flow Rate (cc/sec):	5.27 x 10^-5	
Perm. (cm/sec):	5.36 x 10^-8	

SAMPLE DATA:
Sample Identification: Sample Labeled North Pond - Northwest Bottom
Visual Description: Red Lean Clay with Sand

Remarks: Clovis, New Mexico

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: Flexible Wall
Sample type: In-Place



Project: Enviro-Ag Engineering, Inc.
Location: Stark Dairy Lagoon
Date: 11-29-2003

PERMEABILITY TEST REPORT

DYESS-PETERSON TESTING LABORATORY, INC.

Project No.: DP-2185
File No.: PT-3
Lab No.: DP-6409-C
Tested by:
Checked by:
Test: CH - Constant head

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 12.70
Specimen Diameter (cm): 6.78
Dry Unit Weight (pcf): 105.5
Moisture Before Test (%): 15.9
Moisture After Test (%): 21.8

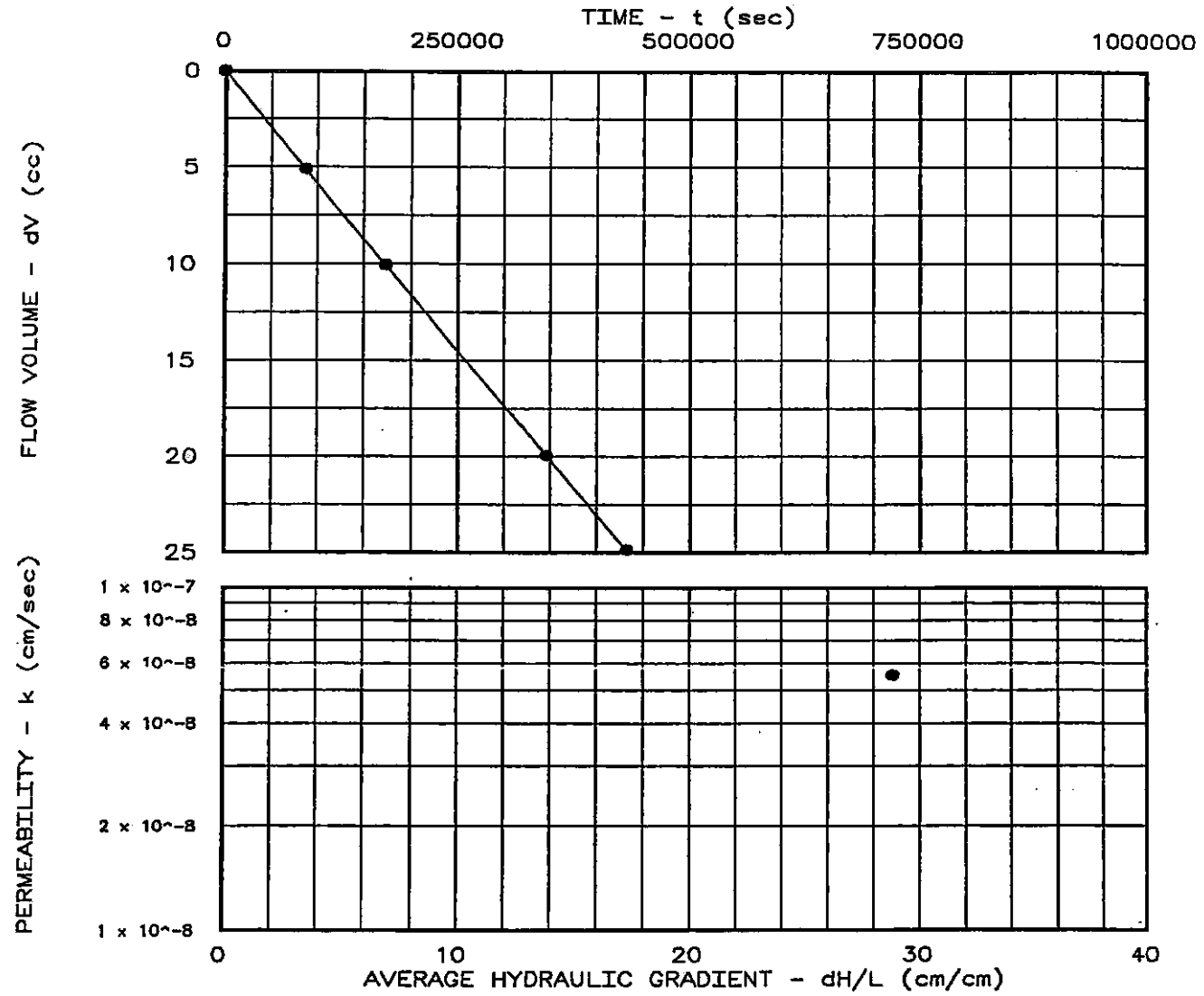
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	50.0	
Test Pressure(psi):	50.3	
Back Pressure(psi):	45.1	
Diff. Head (psi):	5.2	
Flow Rate (cc/sec):	5.74 x 10^-5	
Perm. (cm/sec):	5.53 x 10^-8	

SAMPLE DATA:

Sample Identification: Sample Labeled North Pond - Slope
Visual Description: Reddish Brown Lean Clay with Sand
Remarks: Clovis, New Mexico

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: Flexible Wall
Sample type: In-Place



Project: Enviro-Ag Engineering, Inc.
Location: Stark Dairy Lagoon
Date: 11-29-2003

PERMEABILITY TEST REPORT

DYESS-PETERSON TESTING LABORATORY, INC.

Project No.: DP-2185
File No.: PT-2
Lab No.: DP-6409-B
Tested by:
Checked by:
Test: CH - Constant head

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 12.70
Specimen Diameter (cm): 7.49
Dry Unit Weight (pcf): 106.9
Moisture Before Test (%): 17.6
Moisture After Test (%): 20.9

Run Number:	1 ●	2 ▲
Cell Pressure (psi):	50.0	
Test Pressure(psi):	49.7	
Back Pressure(psi):	45.0	
Diff. Head (psi):	4.7	
Flow Rate (cc/sec):	5.92 x 10^-5	
Perm. (cm/sec):	5.15 x 10^-8	

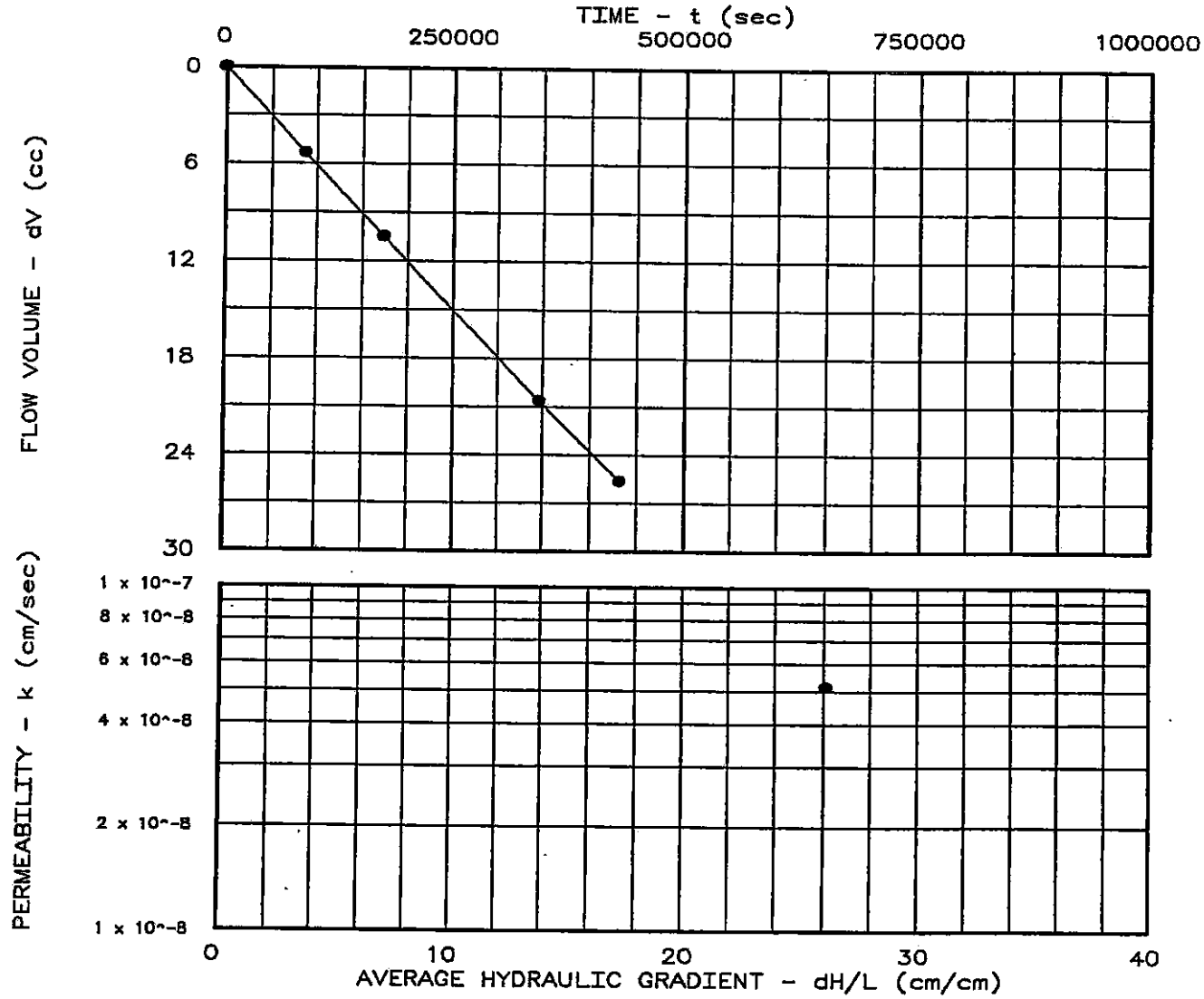
SAMPLE DATA:

Sample Identification: Sample Labeled South Pond - Northwest Bottom
Visual Description: Red Lean Clay with Sand

Remarks: Clovis, New Mexico

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: Flexible Wall
Sample type: In-Place



Project: Enviro-Ag Engineering, Inc.
Location: Stark Dairy Lagoon
Date: 11-29-2003

PERMEABILITY TEST REPORT

DYESS-PETERSON TESTING LABORATORY, INC.

Project No.: DP-2185
File No.: PT-4
Lab No.: DP-6409-D
Tested by:
Checked by:
Test: CH - Constant head

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 12.70
Specimen Diameter (cm): 6.73
Dry Unit Weight (pcf): 109.8
Moisture Before Test (%): 15.0
Moisture After Test (%): 19.4

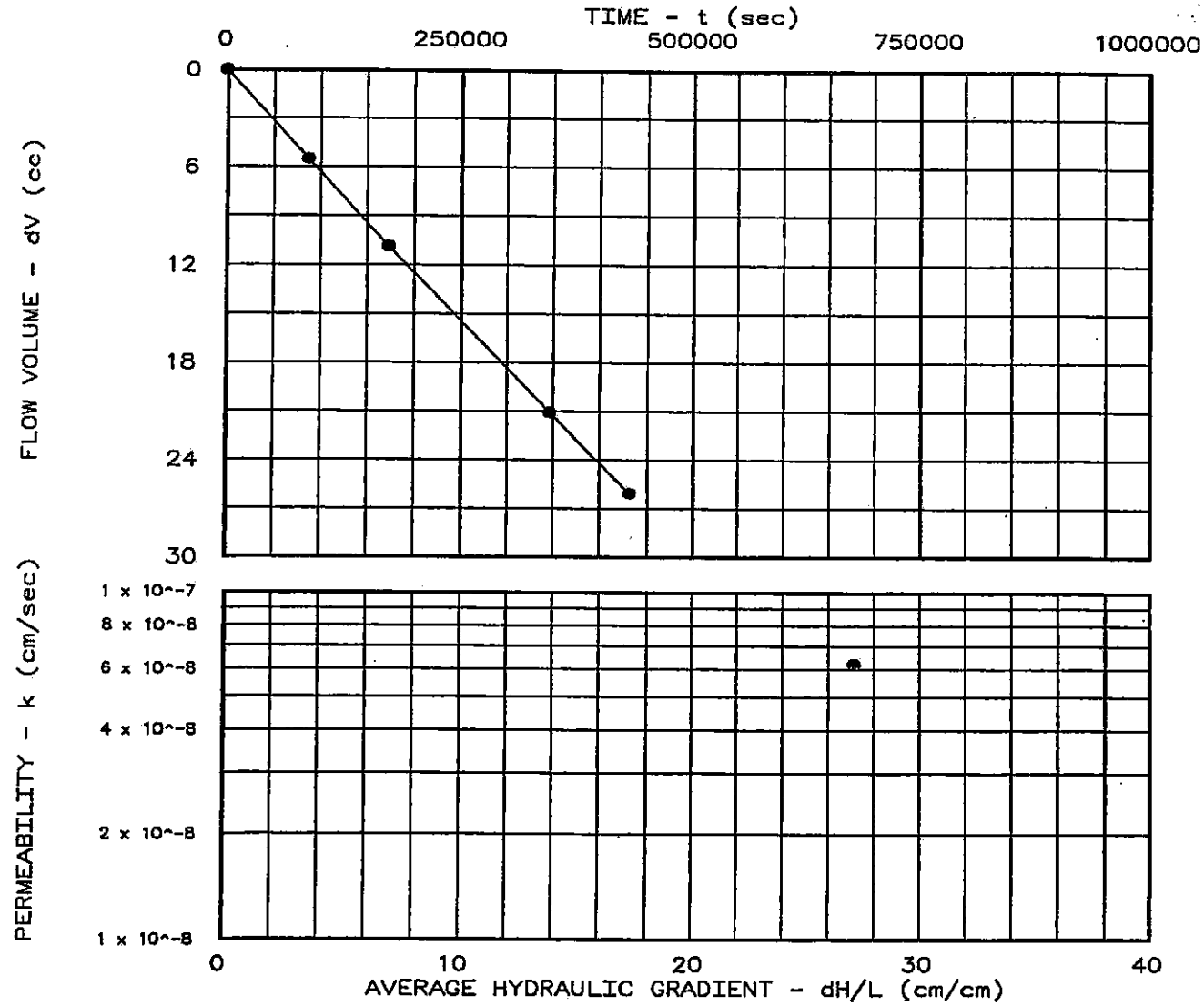
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	50.0	
Test Pressure(psi):	50.0	
Back Pressure(psi):	45.1	
Diff. Head (psi):	4.9	
Flow Rate (cc/sec):	6.01 x 10^-5	
Perm. (cm/sec):	6.23 x 10^-8	

SAMPLE DATA:

Sample Identification: Sample Labeled South Pond - Southeast Bottom
Visual Description: Red Clayey Sand with Pieces of Wood
Remarks: Clovis, New Mexico

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: Flexible Wall
Sample type: In-Place



Project: Enviro-Ag Engineering, Inc.
Location: Stark Dairy Lagoon
Date: 11-29-2003

PERMEABILITY TEST REPORT

DYESS-PETERSON TESTING LABORATORY, INC.

Project No.: DP-2185
File No.: PT-1
Lab No.: DP-6409-A
Tested by:
Checked by:
Test: CH - Constant head

ESTIMATION OF SPECIFIC DISCHARGE
vs. INSTALLED CLAY LINER

SITE:	Stark Dairy	BJW
LOCATION:	Clovis, NM	10-Dec-03
POND:	North & South Ponds	

This worksheet estimates the specific discharge through a soil liner based on the measured thickness of the installed clay liner and the results of permeability testing. The estimated specific discharge of the installed liner is then compared to a calculated specific discharge of a theoretical pond of similar size and depth lined with 1.5 feet of 1 x 10E-7 homogeneous clay material.

	North Pond	North Pond	South Pond	South Pond	BENCHMARK
1. Water Depth, feet	21	21	21	21	21
2. Liner Thickness, inches	18.0	18.0	18.0	18.0	18.0
3. Hydraulic Conductivity, cm/sec	5.36E-08	5.53E-08	5.15E-08	6.23E-08	1.0E-07
4. Calculated specific discharge, v'					
a.) feet per day	0.00228	0.00235	0.00219	0.00265	**0.00425**
b.) feet per year	0.832	0.858	0.799	0.967	**1.552**

NOTES:

(1) Maximum water depth of pond in feet.

(2) Enter the measured clay liner thickness in inches.

(3) Enter the hydaulic conductivity of each remolded sample as determined by flexible wall permeameter in cm/sec (Ref: ASTM D 5084).

(4) The specific discharge is estimated for each section of the pond floor and the US EPA benchmark

The following equation is used:

$$v' = k (H + d) / d$$

where: v' = Specific Discharge of area representative of soil sample, feet/day

d = Liner Thickness, feet

k = Hydaulic Conductivity of liner based on sample testing, feet/day

H = Maximum Water Depth, feet

Ref: South NTC Bulletin No. S210-4-5, Appendix 1, Equation (2)

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12/10/2003

Lydick Engineering & Surveyors, Inc. Test Reports

-Particle Size Analysis of Soils
-Atterberg Limits Report
- Proctor Report
-Field Moisture/Density Reports

Lydick Laboratories
205 east 2nd street
Clovis, New Mexico 88102
(505) 762-3771

Date: August 11, 2003
Tested By: ROBERT MICK
Sampled By: CONTRACTOR

Contractor: DON POOL CONSTRUCTION
Project: STARK DAIRY
Source: LINER MATERIAL LAGOON

ASTM D-422
PARTICLE SIZE ANAYSIS OF SOILS

Sieve analysis + No. 10 (200-mm)

Sieve	Retained	% Passing
No. 4	0	100.00
No. 10	0.8	99.98

Hygroscopic Moisture Corr. Factor

Wet	29.85
Dry	29.44
FACTOR	1.393

Percentages of Soil in Suspension

Mass of Soil in Pycnometer			50.0
Corrected Mass in Pycnometer			49.3
Oven Dried Mass after dispersion			10.79
W	=		10.8
a	=		
R	=	151H	1.019
R	=	152H	
G	=	*Assumed*	2.650
G1	=		1.030

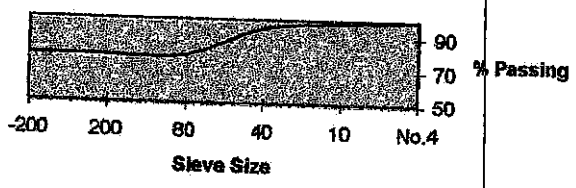
(151-H) $P = [(100\,000 / W) \times G / (G - G1)] (R - G1)$ -166.74

W oven-dried mass of soil in a total test sample represented by mass of soil dispersed.
a correction faction applied to the reading of hydrometer 152H
P percentage of soil in suspension
R hydrometer reading with correction applied
G specific gravity of soil particles
G1 specific gravity of the liquid in which the soil particles are suspended.

Sieve Analysis - No. 10 (200-mm)

Sieve No.	Retained	% Passing
No. 4	0	100
N0. 10	0.77	98
No. 40	2.38	95
No. 200	10.75	78
Pan	10.77	78
T - 11	10.79	78

Gradation



Note: *The specific gravity of the soil is assumed to be 2.650.*

Robert Mick

Reviewed By: (Lab Supervisor)

Certified By:

Created By : Jorge Serrano for :Lydick Laboratories

Kpa Developments

Atterberg Report

To: DON POOL CONSTRUCTION

Project: STARK DAIRY LAGOONS

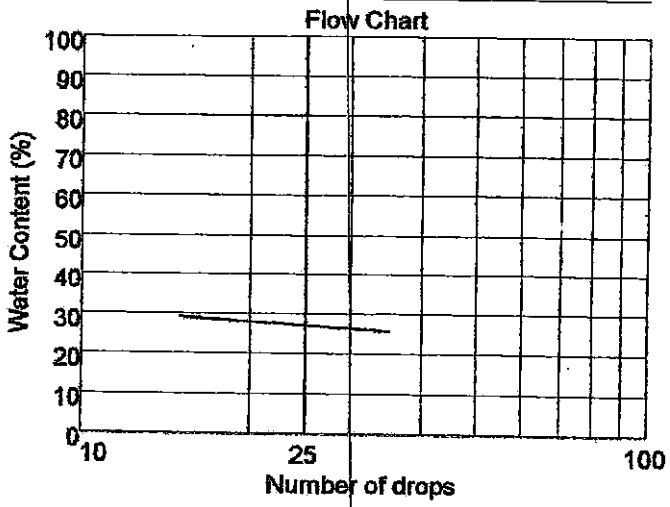
Project Number:	STARK 6-03
Report Number:	1
Report Date:	8/11/2003
Authorized By:	DON POOL
Performed By:	R.MICK
Bore #:	1
Sample #:	1
Bore Date:	8/8/2003
Preparation (Wet/Dry):	WET/DRY
Page:	1 of 1

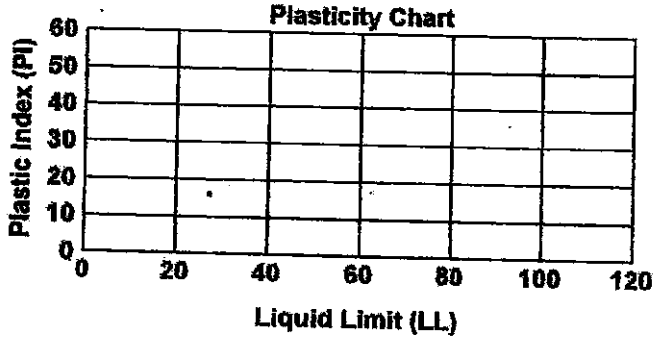
Plastic Limit

Tare #	9			
Tare Weight	22.22			
Tare + Wet Soil	26.87			
Tare + Dry Soil	26.4			
Weight of Water	0.47			
Weight of Dry Soil	4.18			
Water Content	11.2			

Liquid Limit

Tare #	12	1		
Tare Weight	22.08	22.39		
Tare + Wet Soil	37.39	38.54		
Tare + Dry Soil	34.01	35.15		
Number of Blows	20	30		
Weight of Water	3.38	3.39		
Weight of Dry Soil	11.93	12.76		
Water Content	28.3	26.6		





Liquid Limit	**27**	**Natural Water Content**
Plastic Limit	**11**	**Classification of Sample**
Plasticity Index	**16**	
Method A		

EXISTING

Per: Robert Mick

Lydick Engineers & Surveyors, Inc.
P. O. Box 728
205 E. 2nd Street
Clovis, NM 88101
505-762-3771

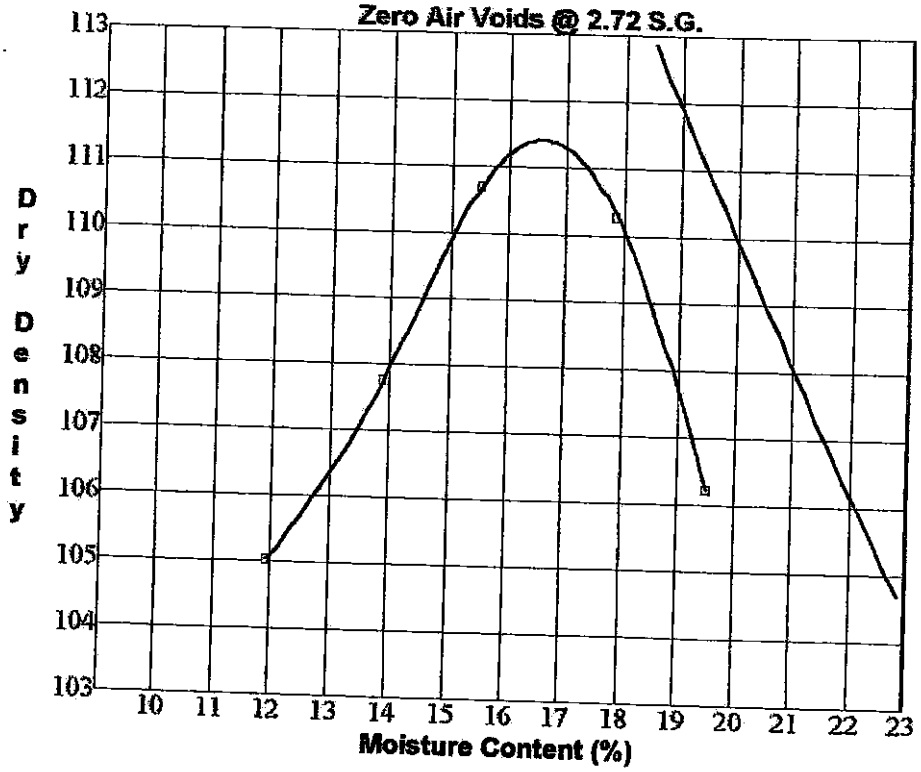
Proctor Report

Report Date:	18-Aug-03
Project:	stark1-03
Report Number:	3
Sample Type:	COMPOSITE
Sampled By:	CONTRACTOR
Source:	LAGOON AREA
Tested By:	R. MICK

To: DON POOL CONSTRUCTION
5100 MABRY DRIVE
CLOVIS, NM 88101

Proj:STARK DAIRY

Sample Date: 8-Aug-03 | Date Tested: 18-Aug-03 | Date Received: 8-Aug-03



Max. Dry Density: 111.4
Optimum Moisture (%): 16.6

Moisture Content	Dry Density	Wet Density
11.9	105.0	117.6
13.9	107.8	122.7
15.5	110.7	127.9
17.9	110.3	130.0
19.5	106.2	127.0

Method: ASTM D-698
Rammer Type: MECHANICAL
Preparation: DRY
% Retained 5mm screen: 0.0
% Retained 10mm screen: 0.0
% Retained 20mm screen: 0.0

Sample Description: LAGOON LINER MATERIAL

Per: Robert Mick

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of test results is provided only on written request.

Lydick Engineers & Surveyors, Inc.

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Clovis, NM 88101
505-762-3771

Field Densities

To: DON POOL CONSRTUCTION
5100 MABRY DRIVE
CLOVIS NM 88101

Project: STARK DAIRY PWRS LAGOON

Project Number:	STARK 5-03
Report Number:	3
Report Date:	10/1/2003
Technician:	ROBERT MICK
Depth:	6"
Maximum Dry Density:	111.4
Optimum Moisture:	16.6
Test Date:	9/25/2003
% Compaction Required:	90.0
Page:	1 of 1

ID No.	Sample Location	Wet Density (lb./ft.^{3})	Moist. Content (%)	Dry Density (lb./ft.^{3})	Percent of Max. (%)
1	NW CORNER	127.0	13.3	112.1	100.6
2	WEST MIDDLE	123.1	13.4	108.6	97.5
3	SW CORNER	129.0	14.9	112.3	100.8
4	SOUTH MIDDLE	121.3	13.7	106.7	95.8
5	MIDDLE MIDDLE	121.0	13.4	106.7	95.8
6	NORTH MIDDLE	124.5	13.6	109.6	98.4
7	NE CORNER	126.4	14.2	110.7	99.4
8	EAST MIDDLE	127.7	13.6	112.4	100.9
9	SE CORNER	121.6	14.3	106.4	95.5
10	SOUTH SLOPE	125.0	15.0	108.7	97.6
11	SOUTH END WEST SLOPE	122.3	14.7	106.6	95.7
12	NORTH END WEST SLOPE	123.5	14.1	108.2	97.1
13	NORTH SLOPE	120.8	13.7	106.2	95.3
14	NORTH END EAST SLOPE	124.6	15.1	108.3	97.2
15	SOUTH END EAST SLOPE	124.0	14.9	107.9	96.9

EXISTING 1ST LIFT

Per: Robert Mick

Lydick Engineers & Surveyors, Inc.
P. O. Box 728
205 E. 2nd Street
Clovis, NM 88101
505-762-3771

Field Densities

To: DON POOL CONSRTUCTION
5100 MABRY DRIVE
CLOVIS NM 88101

Project: STARK DAIRY PWRS LAGOON

Project Number:	STARK 5-03
Report Number:	5
Report Date:	10/6/2003
Technician:	ROBERT MICK
Depth:	6"
Maximum Dry Density:	111.4
Optimum Moisture:	16.6
Test Date:	10/2/2003
% Compaction Required:	90.0
Page:	1 of 1

ID No.	Sample Location	Wet Density (lb./ft.³)	Moist. Content (%)	Dry Density (lb./ft.³)	Percent of Max. (%)
1	NW CORNER	124.2	11.4	111.5	100.1
2	WEST MIDDLE	130.8	17.0	111.8	100.4
3	SW CORNER	130.1	16.1	112.1	100.6
4	SOUTH MIDDLE	126.0	15.0	109.6	98.4
5	MIDDLE MIDDLE	128.0	14.4	111.9	100.4
6	NORTH MIDDLE	122.1	13.2	107.9	96.9
7	NE CORNER	128.1	14.3	112.1	100.6
8	EAST MIDDLE	128.0	14.3	112.0	100.5
9	SE CORNER	127.6	14.1	111.8	100.4
10	SOUTH SLOPE	125.7	15.0	109.3	98.1
11	SOUTH END WEST SLOPE	126.0	16.0	108.6	97.5
12	NORTH END WEST SLOPE	125.5	14.7	109.4	98.2
13	NORTH SLOPE	126.7	17.1	108.2	97.1
14	NORTH END EAST SLOPE	124.6	16.0	107.4	96.4
15	SOUTH END EAST SLOPE	127.0	15.4	110.1	98.8

EXISTING 2ND LIFT

Per: Robert Mick

Lydick Engineers & Surveyors, Inc.

P. O. Box 728
205 E. 2nd Street
Clovis, NM 88101
505-762-3771

Field Densities

To: DON POOL CONSRTUCTION
5100 MABRY DRIVE
CLOVIS NM 88101

Project: STARK DAIRY PWRS LAGOON

Project Number:	STARK 5-03
Report Number:	6
Report Date:	10/8/2003
Technician:	ROBERT MICK
Depth:	6"
Maximum Dry Density:	111.4
Optimum Moisture:	16.6
Test Date:	10/7/2003
% Compaction Required:	90.0
Page:	1 of 1

ID No.	Sample Location	Wet Density (lb./ft.³)	Moist. Content (%)	Dry Density (lb./ft.³)	Percent of Max. (%)
1	NW CORNER	127.2	14.0	111.6	100.2
2	WEST MIDDLE	127.7	14.4	111.6	100.2
3	SW CORNER	127.3	14.0	111.7	100.3
4	SOUTH MIDDLE	125.9	14.9	109.6	98.4
5	MIDDLE MIDDLE	128.3	16.2	110.4	99.1
6	NORTH MIDDLE	125.2	15.1	108.8	97.7
7	NE CORNER	126.1	15.1	109.6	98.4
8	EAST MIDDLE	128.9	15.5	111.6	100.2
8	SE CORNER	126.4	14.3	110.6	99.3

EXISTING 3RD LIFT

Per: Robert Mick

Lydick Engineers & Surveyors, Inc.

P. O. Box 728
205 E. 2nd Street
Clovis, NM 88101
505-762-3771

Field Densities

To: DON POOL CONSRTUCTION
5100 MABRY DRIVE
CLOVIS NM 88101

Project: STARK DAIRY RCS LAGOON

Project Number:	STARK 5-03
Report Number:	2
Report Date:	10/1/2003
Technician:	ROBERT MICK
Depth:	6"
Maximum Dry Density:	111.4
Optimum Moisture:	16.6
Test Date:	9/25/2003
% Compaction Required:	90.0
Page:	1 of 1

ID No.	Sample Location	Wet Density (lb./ft.^{3})	Moist. Content (%)	Dry Density (lb./ft.^{3})	Percent of Max. (%)
1	NE CORNER	127.2	13.4	112.2	100.7
2	NORTH MIDDLE	126.2	12.7	112.0	100.5
3	NW CORNER	128.8	17.0	110.1	98.8
4	SW CORNER	127.8	14.1	112.0	100.5
5	SOUTH MIDDLE	121.0	13.5	106.6	95.7
6	SE CORNER	124.7	13.7	109.7	98.5
7	EAST SLOPE	123.0	14.6	107.3	96.3
8	EAST END NORTH SLOPE	124.0	13.8	109.0	97.8
9	WEST END NORTH SLOPE	122.4	14.1	107.3	96.3
10	WEST SLOPE	125.0	15.0	108.7	97.6
11	WEST END SOUTH SLOPE	121.4	13.1	107.3	96.3
12	EAST END SOUTH SLOPE	123.0	13.7	108.2	97.1

EXISTING 1ST LIFT

Per: Robert Mick

Lydick Engineers & Surveyors, Inc.

P. O. Box 728
205 E. 2nd Street
Clovis, NM 88101
505-762-3771

Field Densities

To: DON POOL CONSRTUCTION
5100 MABRY DRIVE
CLOVIS NM 88101

Project: STARK DAIRY RCS LAGOON

Project Number:	STARK 5-03
Report Number:	2
Report Date:	10/6/2003
Technician:	ROBERT MICK
Depth:	6"
Maximum Dry Density:	111.4
Optimum Moisture:	16.6
Test Date:	10/2/2003
% Compaction Required:	90.0
Page:	1 of 1

ID No.	Sample Location	Wet Density (lb./ft.³)	Moist. Content (%)	Dry Density (lb./ft.³)	Percent of Max. (%)
1	SW CORNER	127.2	14.1	111.5	100.1
2	SOUTH MIDDLE	127.6	14.9	111.1	99.7
3	SE CORNER	123.3	14.4	107.8	96.8
4	NE CORNER	128.9	15.1	112.0	100.5
5	NORTH MIDDLE	126.0	14.5	110.0	98.7
6	NW CORNER	124.7	15.7	107.8	96.8
7	WEST END NORTH SLOPE	124.5	14.6	108.6	97.5
8	EAST END NORTH SLOPE	125.0	15.0	108.7	97.6
9	EAST SLOPE	127.5	14.1	111.7	100.3
10	EAST END SOUTH SLOPE	124.7	14.6	108.8	97.7
11	WEST END SOUTH SLOPE	123.4	14.0	108.2	97.1
12	WEST SLOPE	125.0	14.6	109.1	97.9

EXISTING 2ND LIFT

Per: Robert Mick

Lydick Engineers & Surveyors, Inc.

P. O. Box 728
205 E. 2nd Street
Clovis, NM 88101
505-762-3771

Field Densities

To: DON POOL CONSRTUCTION
5100 MABRY DRIVE
CLOVIS NM 88101

Project: STARK DAIRY RCS LAGOON

Project Number:	STARK 5-03
Report Number:	7
Report Date:	10/8/2003
Technician:	ROBERT MICK
Depth:	6"
Maximum Dry Density:	111.4
Optimum Moisture:	16.6
Test Date:	10/7/2003
% Compaction Required:	90.0
Page:	1 of 1

ID No.	Sample Location	Wet Density (lb./ft.³)	Moist. Content (%)	Dry Density (lb./ft.³)	Percent of Max. (%)
1	SW CORNER	127.2	13.2	112.4	100.9
2	SOUTH MIDDLE	128.6	15.3	111.5	100.1
3	SE CORNER	128.0	14.3	112.0	100.5
4	NE CORNER	127.3	14.0	111.7	100.3
5	NORTH MIDDLE	124.7	14.0	109.4	98.2
6	NW CORNER	128.5	16.0	110.8	99.5

EXISTING 3RD LIFT

Per: Robert Mick

ENVIRO-AG
EAE
ENGINEERING, INC.

STARK DAIRY
Clovis, New Mexico

Capacity Certification for Wastewater Ponds

Two wastewater ponds at Stark Dairy were surveyed by Enviro-Ag Engineering, Inc. to determine the total capacity of each. The survey data was obtained using a Corvallis GPS surveying system.

North Pond - *30.95 Acre-Feet*
South Pond - *88.54 Acre-Feet*

The calculated volume exceeds the total volume required by this dairy's NMED Groundwater Discharge Permit No. 01413.

Respectfully Submitted,

BRAD J. WIECK
NEW MEXICO
14900
REGISTERED PROFESSIONAL ENGINEER

Brad J. Wieck, PE
12/10/2003

Brad Wieck, P.E.
Enviro-Ag Engineering, Inc.

Attachments: Pond Capacity & Volume Charts

702 QUAIL CREEK DRIVE • AMARILLO, TEXAS 79124 • TEL (806) 353-6123 • FAX (806) 353-4132
www.enviroagengineers.com

Stark Dairy – November 2003

North Pond Volume Data

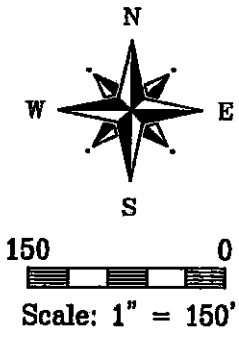
Date Surveyed: 11/2003

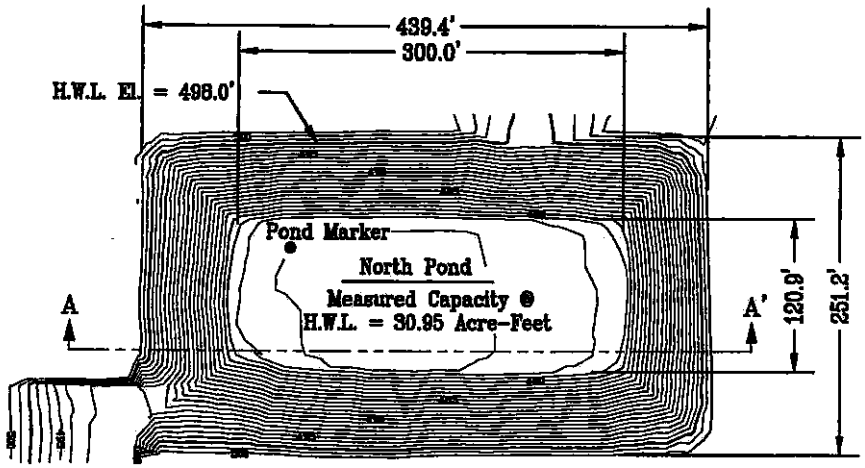
SURVEYED BY: CM, CP

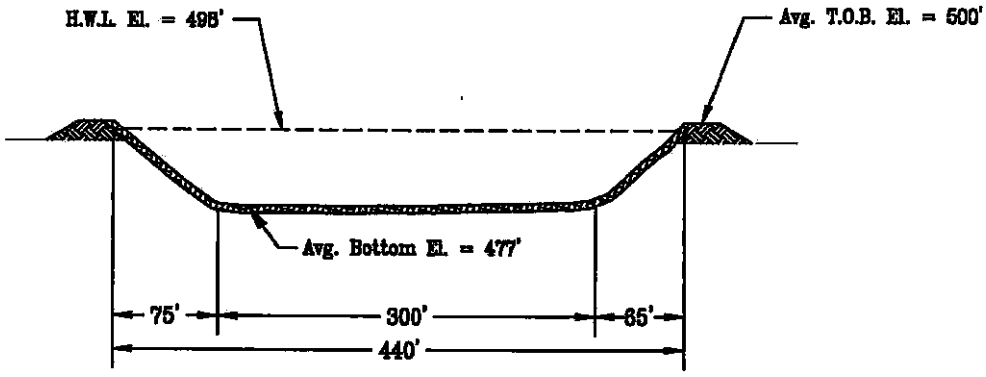
Avg. T.O.B. Elevation	500'
Avg. Bottom Elevation	477'
H.W.L. Elevation @ 2' Freeboard	498'
Capacity at H.W.L.	30.95 Ac–Ft
Surface Area @ Design H.W.L.	2.33 Acres

Note:

1) Bottom elevation at Lagoon Marker = 477'



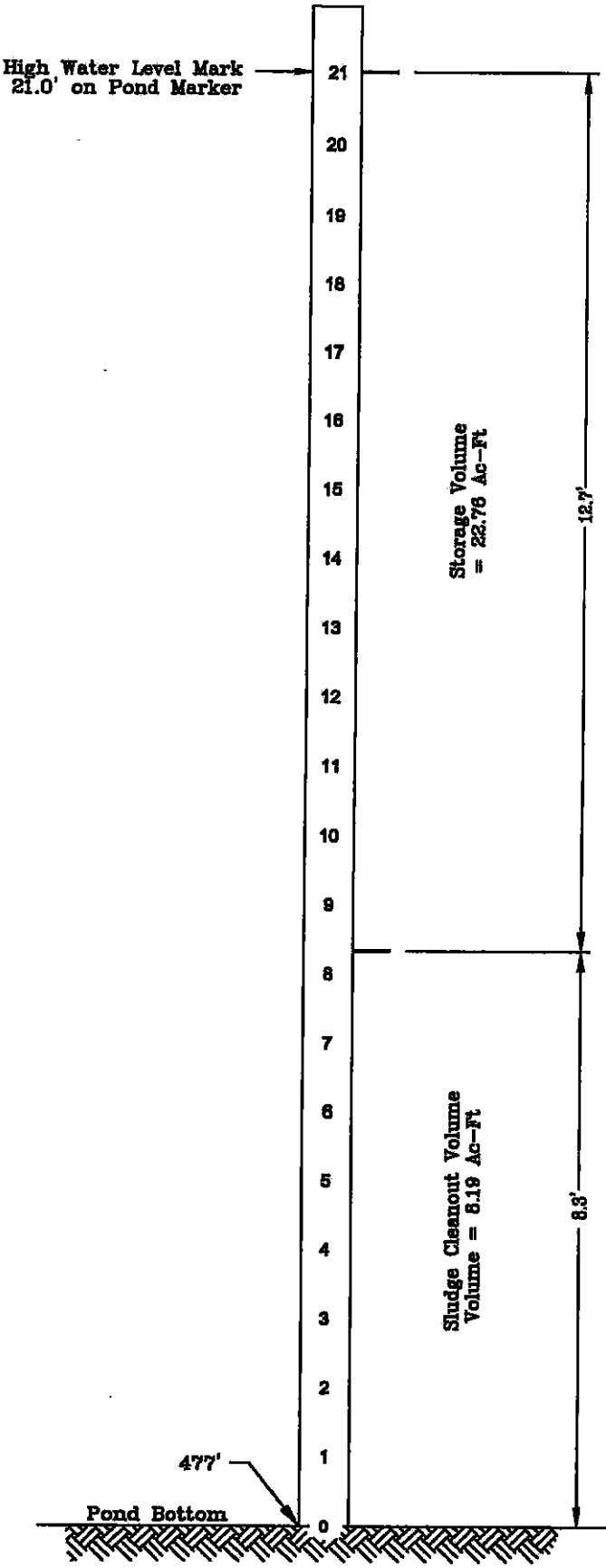




Cross–Section A – A'

Not to Scale

STARK DAIRY Clovis, Curry County, NM	North Pond Capacity Drawing Plan and Profile	ENVIRO–AG EAE ENGINEERING Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 702 QUAIL CREEK DRIVE AMARILLO, TEXAS 79124 TEL (806) 353-6123 FAX (806) 353-4132



VOLUME BY FOOT CHART	
2.36 Ac-Ft	769,012 Gal.
2.33 Ac-Ft	759,237 Gal.
2.28 Ac-Ft	742,944 Gal.
2.20 Ac-Ft	716,876 Gal.
2.10 Ac-Ft	684,291 Gal.
2.06 Ac-Ft	671,257 Gal.
1.92 Ac-Ft	625,637 Gal.
1.70 Ac-Ft	553,950 Gal.
1.64 Ac-Ft	534,398 Gal.
1.57 Ac-Ft	511,589 Gal.
1.48 Ac-Ft	482,282 Gal.
1.33 Ac-Ft	433,384 Gal.
1.20 Ac-Ft	391,023 Gal.
0.99 Ac-Ft	322,594 Gal.
0.91 Ac-Ft	296,526 Gal.
0.89 Ac-Ft	290,009 Gal.
0.87 Ac-Ft	283,492 Gal.
0.84 Ac-Ft	273,716 Gal.
0.82 Ac-Ft	267,199 Gal.
0.78 Ac-Ft	254,165 Gal.
0.68 Ac-Ft	221,650 Gal.

STARK
DAIRY
Clovis, Curry County, NM

North Pond Capacity Drawing
Pond Marker Schematic

ENVIRO-AG EAE ENGINEERING
Enviro-Ag Engineering, Inc.
ENGINEERING CONSULTANTS
702 QUAIL CREEK DRIVE
AMARILLO, TEXAS 79124
TEL (806) 353-6123 FAX (806) 353-4132

Stark Dairy – November 2003

South Pond Volume Data

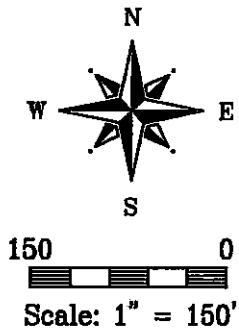
Date Surveyed: 11/2003

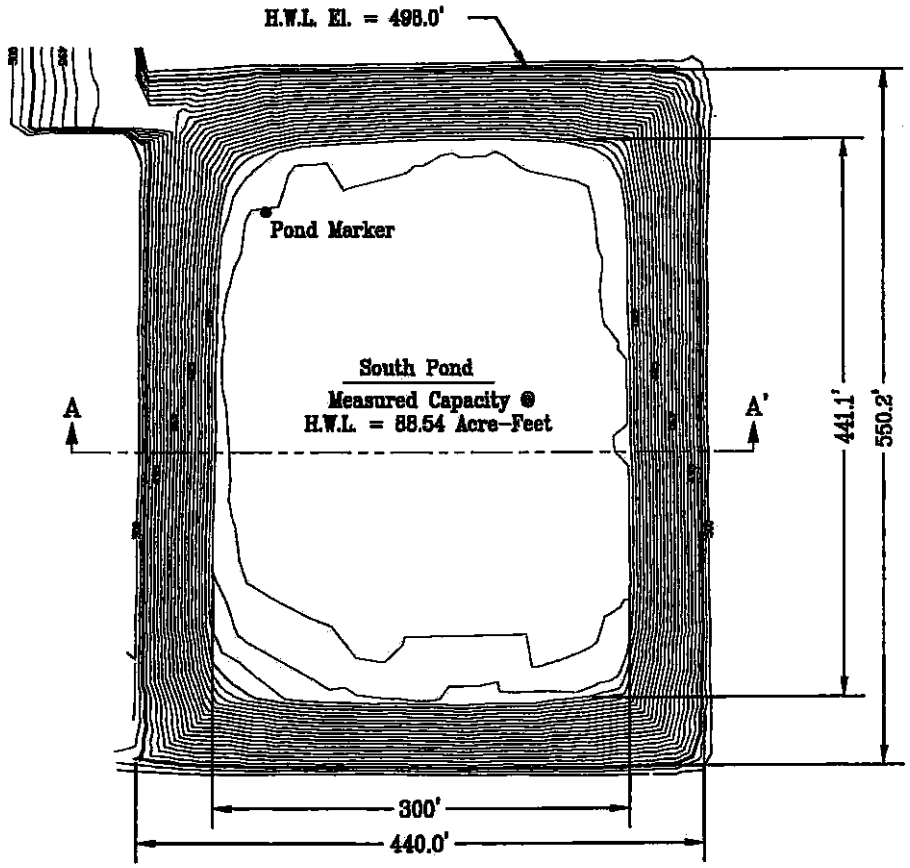
SURVEYED BY: CM, CP

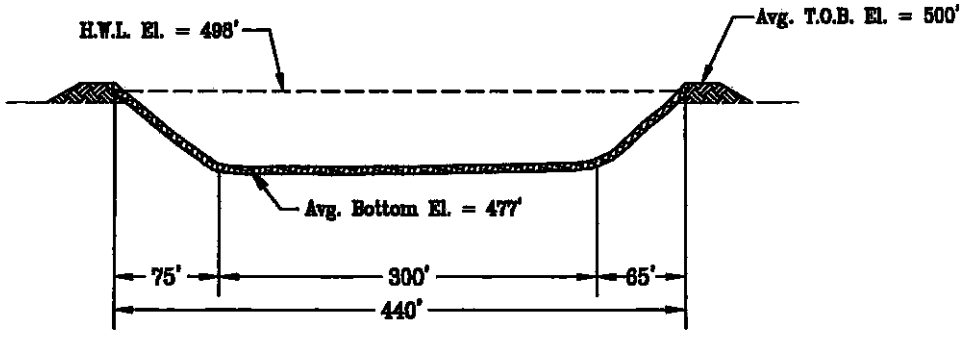
Avg. T.O.B. Elevation	500'
Avg. Bottom Elevation	477'
H.W.L. Elevation @ 2' Freeboard	498'
Capacity at H.W.L.	88.54 Ac–Ft
Surface Area @ Design H.W.L.	5.39 Acres

Note:

1) Bottom elevation at Lagoon Marker = 477'



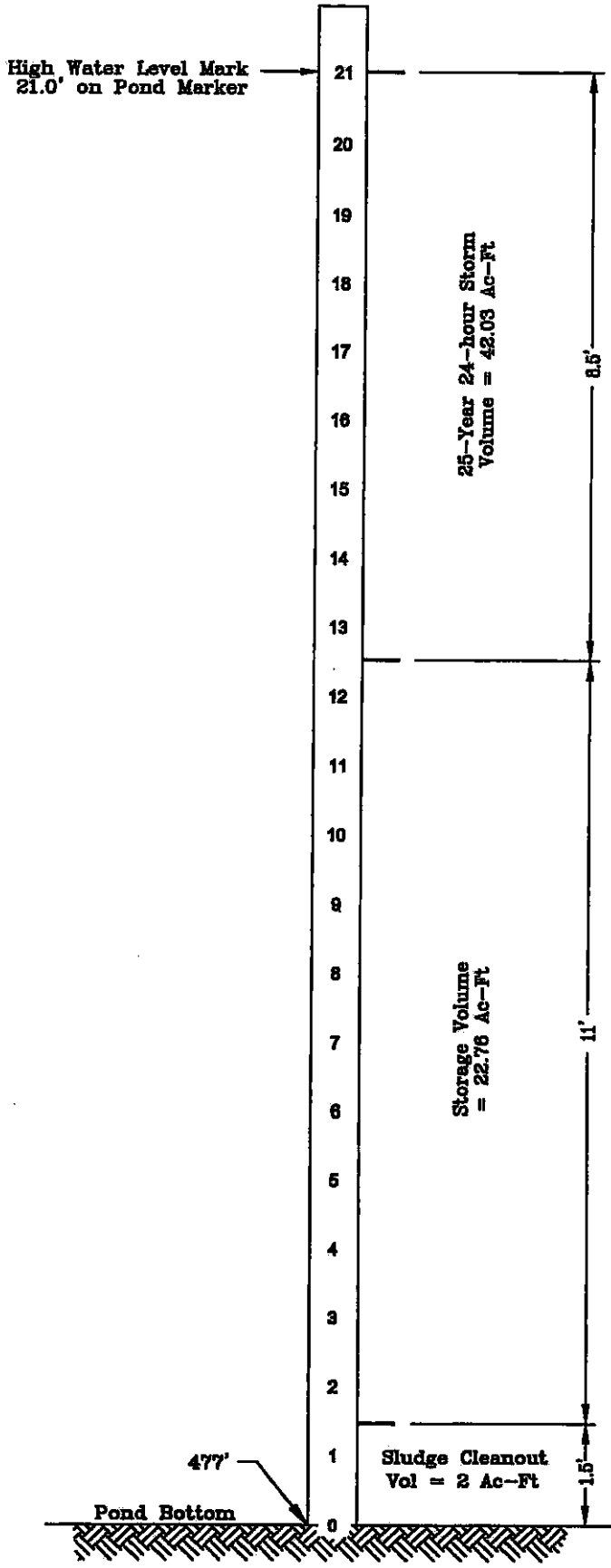




Cross–Section A – A'

Not to Scale

STARK DAIRY Clovis, Curry County, NM	South Pond Capacity Drawing Plan and Profile	ENVIRO–AG EAE ENGINEERING Enviro-Ag Engineering, Inc. ENGINEERING CONSULTANTS 702 QUAIL CREEK DRIVE AMARILLO, TEXAS 79124 TEL (806) 353-8123 FAX (806) 353-4132



VOLUME BY FOOT CHART	
5.43 Ac-Ft	1,769,380 Gal.
5.40 Ac-Ft	1,759,605 Gal.
5.34 Ac-Ft	1,740,054 Gal.
5.26 Ac-Ft	1,713,985 Gal.
5.17 Ac-Ft	1,684,659 Gal.
5.07 Ac-Ft	1,652,073 Gal.
4.88 Ac-Ft	1,590,161 Gal.
4.48 Ac-Ft	1,459,820 Gal.
4.37 Ac-Ft	1,423,976 Gal.
4.26 Ac-Ft	1,388,133 Gal.
4.23 Ac-Ft	1,378,357 Gal.
4.12 Ac-Ft	1,342,513 Gal.
3.98 Ac-Ft	1,296,894 Gal.
3.49 Ac-Ft	1,137,226 Gal.
3.34 Ac-Ft	1,088,348 Gal.
3.29 Ac-Ft	1,072,055 Gal.
3.24 Ac-Ft	1,055,763 Gal.
3.20 Ac-Ft	1,042,729 Gal.
3.17 Ac-Ft	1,032,953 Gal.
3.12 Ac-Ft	1,016,661 Gal.
3.70 Ac-Ft	1,205,655 Gal.

STARK DAIRY
Clovis, Curry County, NM

South Pond Capacity Drawing
Pond Marker Schematic

ENVIRO-AG EAE ENGINEERING

Enviro-Ag Engineering, Inc.
ENGINEERING CONSULTANTS
702 QUAIL CREEK DRIVE
AMARILLO, TEXAS 79124
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 Supporting Documentation.
Conservation Tillage	n/a
Grass Filter Strips	n/a
Terraces	n/a
Tailwater Control	n/a
Other (describe):	n/a

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.

SECTION 5 NUTRIENT BUDGETS AND ASSESSMENTS

5.1 Land Application Data

Land application data 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 Table 5.1. The table demonstrates compliance with the following specific permit terms:

1) The outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field. The potential for nitrogen and phosphorus transport shall be determined 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);
2) the crops to be planted in each field or any other uses of a field such as pasture or fallow fields, including alternative crops if applicable. Any alternative crops included in the NMP must be listed by field, in addition to the crops identified in the planned crop rotation for that field; and
3) the timing and method of land application.

LAND APPLICATION DATA
Table 5.1

Facility Name: Stark Dairy

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, d)	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	Forage Sorghum	Small Grain (SG) Silage	Sorghum/SG Silage	x		1	Spring/Summer/Fall	1	Liquid	Pivot	N/A	A
			Corn Silage	x		1	Summer	1	Liquid	Pivot	N/A	A
			SG Silage	x		1	Fall/Spring	1	Liquid	Pivot	N/A	A
2	Forage Sorghum	SG Silage	Sorghum/SG Silage	x		1	Spring/Summer/Fall	1	Liquid	Pivot	N/A	A
			Corn Silage	x		1	Summer	1	Liquid	Pivot	N/A	A
			SG Silage	x		1	Fall/Spring	1	Liquid	Pivot	N/A	A
3	Forage Sorghum	SG Silage	Sorghum/SG Silage	x		1	Spring/Summer/Fall	1	Liquid	Pivot	N/A	A
			Corn Silage	x		1	Summer	1	Liquid	Pivot	N/A	A
			SG Silage	x		1	Fall/Spring	1	Liquid	Pivot	N/A	A
4	Forage Sorghum	SG Silage	Sorghum/SG Silage	x		1	Spring/Summer/Fall	1	Solid	Spreader	Incorporated	A
			Corn Silage	x		1	Summer	1	Solid	Spreader	Incorporated	A
			SG Silage	x		1	Fall/Spring	1	Solid	Spreader	Incorporated	A
5	Corn Silage	SG Silage	Sorghum/SG Silage	x		1	Spring/Summer/Fall	1	Solid	Spreader	Incorporated	A
			Forage Sorghum	x		1	Summer	1	Solid	Spreader	Incorporated	A
			SG Silage	x		1	Fall/Spring	1		Spreader	Incorporated	A
6	Corn Silage	SG Silage	Sorghum/SG Silage	x		1	Spring/Summer/Fall	1	Solid	Spreader	Incorporated	A
			Forage Sorghum	x		1	Summer	1	Solid	Spreader	Incorporated	A
			SG Silage	x		1	Fall/Spring	1	Solid	Spreader	Incorporated	A
7	No planned application				x					n/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.
(d) Frequency per month or as needed based on lagoon levels.

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.

Table 5.2a

Stark Dairy
Curry County, NM
Nutrient Management Budgets
2010

			Column A	B	C	D	E		F	G	H	I	J	K	L	M	N
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-36" Soil N Residual lb/Ac (2)	0-12" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Effluent lb/Ac-in N (4)	Effluent lb/Ac-in N Adjusted (5)	Ac-In/Ac effluent to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Effluent lb/Ac-in P2O5 (4)	PI Adjusted P2O5 (8)	P2O5 Applied at N Rate (9)	End Of Year Soil ppm P (10)
Wastewater																	
Field 1	Corn Silage	21-25 T	350	96	52	28	298	Effluent	43	29	10.1	1	0	23	233	233	88
Field 1	Small Grain Silage	8-9 T	95	43	52	28	43	Effluent	43	29	1.5	1	0	23	34	34	24
Field 1	Forage Sorghum	5-6 T	240	83	52	28	188	Effluent	43	29	6.4	1	0	23	147	147	56
Field 1	Sorghum Silage	16-20 T	280	74	52	28	228	Effluent	43	29	7.8	1	0	23	178	178	74
Field 2	Corn Silage	21-25 T	350	96	71	33	279	Effluent	43	29	9.5	1	0	23	218	218	86
Field 2	Small Grain Silage	8-9 T	95	43	71	33	24	Effluent	43	29	0.8	1	0	23	19	19	22
Field 2	Forage Sorghum	5-6 T	240	83	71	33	169	Effluent	43	29	5.8	1	0	23	132	132	55
Field 2	Sorghum Silage	16-20 T	280	74	71	33	209	Effluent	43	29	7.1	1	0	23	164	164	72
Field 3	Corn Silage	21-25 T	350	96	65	21	285	Effluent	43	29	9.7	1	0	23	223	223	76
Field 3	Small Grain Silage	8-9 T	95	43	65	21	30	Effluent	43	29	1.0	1	0	23	23	23	12
Field 3	Forage Sorghum	5-6 T	240	83	65	21	175	Effluent	43	29	6.0	1	0	23	137	137	45
Field 3	Sorghum Silage	16-20 T	280	74	65	21	215	Effluent	43	29	7.3	1	0	23	168	168	62
Manure									lb/Ton	lb/Ton	Ton/Ac			lb/Ton			
Field 4	Corn Silage	21-25 T	350	96	396	39	-46	Manure	17	10	0.0	1	0	9	0	0	0
Field 4	Small Grain Silage	8-9 T	95	43	396	39	-301	Manure	17	10	0.0	1	0	9	0	0	20
Field 4	Forage Sorghum	5-6 T	240	83	396	39	-156	Manure	17	10	0.0	1	0	9	0	0	3
Field 4	Sorghum Silage	16-20 T	280	74	396	39	-116	Manure	17	10	0.0	1	0	9	0	0	7
Field 5	Corn Silage	21-25 T	350	96	333	25	17	Manure	17	10	1.7	1	0	9	16	16	0
Field 5	Small Grain Silage	8-9 T	95	43	333	25	-238	Manure	17	10	0.0	1	0	9	0	0	6
Field 5	Forage Sorghum	5-6 T	240	83	333	25	-93	Manure	17	10	0.0	1	0	9	0	0	0
Field 5	Sorghum Silage	16-20 T	280	74	333	25	-53	Manure	17	10	0.0	1	0	9	0	0	0
Field 6	Corn Silage	21-25 T	350	96	372	22	-22	Manure	17	10	0.0	1	0	9	0	0	0
Field 6	Small Grain Silage	8-9 T	95	43	372	22	-277	Manure	17	10	0.0	1	0	9	0	0	3
Field 6	Forage Sorghum	5-6 T	240	83	372	22	-132	Manure	17	10	0.0	1	0	9	0	0	0
Field 6	Sorghum Silage	16-20 T	280	74	372	22	-92	Manure	17	10	0.0	1	0	9	0	0	0

Notes:

(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas NRCS Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and eastern 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) Column H* Column K = lb/Ac of P2O5 applied.

(10) Projected end of year ppm P based on the application rates established in this spreadsheet.

Table 5.2b

Stark Dairy
Curry County, NM
Nutrient Management Budgets

2011

			Column A	B	C	D	E		F	G	H	I	J	K	L	M	N
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-36" Soil N Residual lb/Ac (2)	0-12" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Effluent lb/Ac-in N (4)	Effluent lb/Ac-in N Adjusted (5)	Ac-In/Ac effluent to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Effluent lb/Ac-in P2O5 (4)	PI Adjusted P2O5 (8)	P2O5 Applied at N Rate (9)	End Of Year Soil ppm P (10)
Wastewater																	
Field 1	Corn Silage	21-25 T	350	96	25	88	325	Effluent	43	29	11.1	1	0	23	254	254	157
Field 1	Small Grain Silage	8-9 T	95	43	25	24	70	Effluent	43	29	2.4	1	0	23	55	55	29
Field 1	Forage Sorghum	5-6 T	240	83	25	56	215	Effluent	43	29	7.3	1	0	23	168	168	93
Field 1	Sorghum Silage	16-20 T	280	74	25	74	255	Effluent	43	29	8.7	1	0	23	200	200	128
Field 2	Corn Silage	21-25 T	350	96	25	86	325	Effluent	43	29	11.1	1	0	23	254	254	156
Field 2	Small Grain Silage	8-9 T	95	43	25	22	70	Effluent	43	29	2.4	1	0	23	55	55	28
Field 2	Forage Sorghum	5-6 T	240	83	25	55	215	Effluent	43	29	7.3	1	0	23	168	168	92
Field 2	Sorghum Silage	16-20 T	280	74	25	72	255	Effluent	43	29	8.7	1	0	23	200	200	127
Field 3	Corn Silage	21-25 T	350	96	25	76	325	Effluent	43	29	11.1	1	0	23	254	254	146
Field 3	Small Grain Silage	8-9 T	95	43	25	12	70	Effluent	43	29	2.4	1	0	23	55	55	18
Field 3	Forage Sorghum	5-6 T	240	83	25	45	215	Effluent	43	29	7.3	1	0	23	168	168	82
Field 3	Sorghum Silage	16-20 T	280	74	25	62	255	Effluent	43	29	8.7	1	0	23	200	200	117
Manure									lb/Ton	lb/Ton	Ton/Ac			lb/Ton			
Field 4	Corn Silage	21-25 T	350	96	46	0	304	Manure	17	10	30.8	1	0	9	290	290	85
Field 4	Small Grain Silage	8-9 T	95	43	301	20	-206	Manure	17	10	0.0	1	0	9	0	0	1
Field 4	Forage Sorghum	5-6 T	240	83	156	3	84	Manure	17	10	8.5	1	0	9	80	80	1
Field 4	Sorghum Silage	16-20 T	280	74	116	7	164	Manure	17	10	16.6	1	0	9	156	156	43
Field 5	Corn Silage	21-25 T	350	96	25	0	325	Manure	17	10	32.9	1	0	9	310	310	93
Field 5	Small Grain Silage	8-9 T	95	43	238	6	-143	Manure	17	10	0.0	1	0	9	0	0	0
Field 5	Forage Sorghum	5-6 T	240	83	93	0	147	Manure	17	10	14.9	1	0	9	140	140	25
Field 5	Sorghum Silage	16-20 T	280	74	53	0	227	Manure	17	10	23.0	1	0	9	216	216	62
Field 6	Corn Silage	21-25 T	350	96	25	0	325	Manure	17	10	32.9	1	0	9	310	310	93
Field 6	Small Grain Silage	8-9 T	95	43	277	3	-182	Manure	17	10	0.0	1	0	9	0	0	0
Field 6	Forage Sorghum	5-6 T	240	83	132	0	108	Manure	17	10	10.9	1	0	9	103	103	9
Field 6	Sorghum Silage	16-20 T	280	74	92	0	188	Manure	17	10	19.1	1	0	9	179	179	46

Notes:

(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas NRCS Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and eastern NM.

(2) Should be taken from annual soil tests results. Years 2-5 are projected until results are obtained.

(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) Column H* Column K = lb/Ac of P2O5 applied.

(10) Projected end of year ppm P based on the application rates established in this spreadsheet.

Table 5.2c

Stark Dairy

Curry County, NM

Nutrient Management Budgets

2012

			Column A	B	C	D	E		F	G	H	I	J	K	L	M	N
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-36" Soil N Residual lb/Ac (2)	0-12" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Effluent lb/Ac-in N (4)	Effluent lb/Ac-in N Adjusted (5)	Ac-In/Ac effluent to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Effluent lb/Ac-in P2O5 (4)	PI Adjusted P2O5 (8)	P2O5 Applied at N Rate (9)	End Of Year Soil ppm P (10)
Wastewater																	
Field 1	Corn Silage	21-25 T	350	96	25	157	325	Effluent	43	29	11.1	1	0	23	254	254	226
Field 1	Small Grain Silage	8-9 T	95	43	25	29	70	Effluent	43	29	2.4	1	0	23	55	55	34
Field 1	Forage Sorghum	5-6 T	240	83	25	93	215	Effluent	43	29	7.3	1	0	23	168	168	130
Field 1	Sorghum Silage	16-20 T	280	74	25	128	255	Effluent	43	29	8.7	1	0	23	200	200	183
Field 2	Corn Silage	21-25 T	350	96	25	156	325	Effluent	43	29	11.1	1	0	23	254	254	225
Field 2	Small Grain Silage	8-9 T	95	43	25	28	70	Effluent	43	29	2.4	1	0	23	55	55	33
Field 2	Forage Sorghum	5-6 T	240	83	25	92	215	Effluent	43	29	7.3	1	0	23	168	168	129
Field 2	Sorghum Silage	16-20 T	280	74	25	127	255	Effluent	43	29	8.7	1	0	23	200	200	182
Field 3	Corn Silage	21-25 T	350	96	25	146	325	Effluent	43	29	11.1	1	0	23	254	254	215
Field 3	Small Grain Silage	8-9 T	95	43	25	18	70	Effluent	43	29	2.4	1	0	23	55	55	23
Field 3	Forage Sorghum	5-6 T	240	83	25	82	215	Effluent	43	29	7.3	1	0	23	168	168	119
Field 3	Sorghum Silage	16-20 T	280	74	25	117	255	Effluent	43	29	8.7	1	0	23	200	200	172
Manure									lb/Ton	lb/Ton	Ton/Ac			lb/Ton			
Field 4	Corn Silage	21-25 T	350	96	25	85	325	Manure	17	10	32.9	1	0	9	310	310	178
Field 4	Small Grain Silage	8-9 T	95	43	206	1	-111	Manure	17	10	0.0	1	0	9	0	0	0
Field 4	Forage Sorghum	5-6 T	240	83	25	1	215	Manure	17	10	21.8	1	0	9	205	205	55
Field 4	Sorghum Silage	16-20 T	280	74	25	43	255	Manure	17	10	25.9	1	0	9	243	243	116
Field 5	Corn Silage	21-25 T	350	96	25	93	325	Manure	17	10	32.9	1	0	9	310	310	187
Field 5	Small Grain Silage	8-9 T	95	43	143	0	-48	Manure	17	10	0.0	1	0	9	0	0	0
Field 5	Forage Sorghum	5-6 T	240	83	25	25	215	Manure	17	10	21.8	1	0	9	205	205	78
Field 5	Sorghum Silage	16-20 T	280	74	25	62	255	Manure	17	10	25.9	1	0	9	243	243	136
Field 6	Corn Silage	21-25 T	350	96	25	93	325	Manure	17	10	32.9	1	0	9	310	310	187
Field 6	Small Grain Silage	8-9 T	95	43	182	0	-87	Manure	17	10	0.0	1	0	9	0	0	0
Field 6	Forage Sorghum	5-6 T	240	83	25	9	215	Manure	17	10	21.8	1	0	9	205	205	62
Field 6	Sorghum Silage	16-20 T	280	74	25	46	255	Manure	17	10	25.9	1	0	9	243	243	120

Notes:

(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas NRCS Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and eastern NM.

(2) Should be taken from annual soil tests results. Years 2-5 are projected until results are obtained.

(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) Column H* Column K = lb/Ac of P2O5 applied.

(10) Projected end of year ppm P based on the application rates established in this spreadsheet.

Table 5.2d

Stark Dairy

Curry County, NM

Nutrient Management Budgets

2013

			Column A	B	C	D	E		F	G	H	I	J	K	L	M	N
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-36" Soil N Residual lb/Ac (2)	0-12" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Effluent lb/Ac-in N (4)	Effluent lb/Ac-in N Adjusted (5)	Ac-In/Ac effluent to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Effluent lb/Ac-in P2O5 (4)	PI Adjusted P2O5 (8)	P2O5 Applied at N Rate (9)	End Of Year Soil ppm P (10)
Wastewater																	
Field 1	Corn Silage	21-25 T	350	96	25	226	325	Effluent	43	29	11.1	1	0	23	254	254	295
Field 1	Small Grain Silage	8-9 T	95	43	25	34	70	Effluent	43	29	2.4	1	0	23	55	55	39
Field 1	Forage Sorghum	5-6 T	240	83	25	130	215	Effluent	43	29	7.3	1	0	23	168	168	168
Field 1	Sorghum Silage	16-20 T	280	74	25	183	255	Effluent	43	29	8.7	1	0	23	200	200	238
Field 2	Corn Silage	21-25 T	350	96	25	225	325	Effluent	43	29	11.1	1	0	23	254	254	294
Field 2	Small Grain Silage	8-9 T	95	43	25	33	70	Effluent	43	29	2.4	1	0	23	55	55	38
Field 2	Forage Sorghum	5-6 T	240	83	25	129	215	Effluent	43	29	7.3	1	0	23	168	168	166
Field 2	Sorghum Silage	16-20 T	280	74	25	182	255	Effluent	43	29	8.7	1	0	23	200	200	237
Field 3	Corn Silage	21-25 T	350	96	25	215	325	Effluent	43	29	11.1	1	0	23	254	254	284
Field 3	Small Grain Silage	8-9 T	95	43	25	23	70	Effluent	43	29	2.4	1	0	23	55	55	28
Field 3	Forage Sorghum	5-6 T	240	83	25	119	215	Effluent	43	29	7.3	1	0	23	168	168	156
Field 3	Sorghum Silage	16-20 T	280	74	25	172	255	Effluent	43	29	8.7	1	0	23	200	200	227
Manure									lb/Ton	lb/Ton	Ton/Ac			lb/Ton			
Field 4	Corn Silage	21-25 T	350	96	25	178	325	Manure	17	10	32.9	1	0	9	310	310	271
Field 4	Small Grain Silage	8-9 T	95	43	111	0	-16	Manure	17	10	0.0	1	0	9	0	0	0
Field 4	Forage Sorghum	5-6 T	240	83	25	55	215	Manure	17	10	21.8	1	0	9	205	205	108
Field 4	Sorghum Silage	16-20 T	280	74	25	116	255	Manure	17	10	25.9	1	0	9	243	243	190
Field 5	Corn Silage	21-25 T	350	96	25	187	325	Manure	17	10	32.9	1	0	9	310	310	280
Field 5	Small Grain Silage	8-9 T	95	43	48	0	47	Manure	17	10	4.8	1	0	9	45	45	1
Field 5	Forage Sorghum	5-6 T	240	83	25	78	215	Manure	17	10	21.8	1	0	9	205	205	131
Field 5	Sorghum Silage	16-20 T	280	74	25	136	255	Manure	17	10	25.9	1	0	9	243	243	210
Field 6	Corn Silage	21-25 T	350	96	25	187	325	Manure	17	10	32.9	1	0	9	310	310	280
Field 6	Small Grain Silage	8-9 T	95	43	87	0	8	Manure	17	10	0.8	1	0	9	8	8	0
Field 6	Forage Sorghum	5-6 T	240	83	25	62	215	Manure	17	10	21.8	1	0	9	205	205	115
Field 6	Sorghum Silage	16-20 T	280	74	25	120	255	Manure	17	10	25.9	1	0	9	243	243	194

Notes:

(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas NRCS Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and eastern NM.

(2) Should be taken from annual soil tests results. Years 2-5 are projected until results are obtained.

(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) Column H* Column K = lb/Ac of P2O5 applied.

(10) Projected end of year ppm P based on the application rates established in this spreadsheet.

Table 5.2e

Stark Dairy
Curry County, NM
Nutrient Management Budgets
2014

			Column A	B	C	D	E		F	G	H	I	J	K	L	M	N
Field ID	Crop	Yield	Crop N Req. lb/Ac (1)	Crop P2O5 Removal Rate lb/Ac (1)	0-36" Soil N Residual lb/Ac (2)	0-12" Soil P Residual ppm (2)	Remainder Crop N required lb/Ac (3)	Source	Effluent lb/Ac-in N (4)	Effluent lb/Ac-in N Adjusted (5)	Ac-In/Ac effluent to apply (6)	P Loss Risk (7)	Com. Fert. Rate N lb/Ac	Effluent lb/Ac-in P2O5 (4)	PI Adjusted P2O5 (8)	P2O5 Applied at N Rate (9)	End Of Year Soil ppm P (10)
Wastewater																	
Field 1	Corn Silage	21-25 T	350	96	25	295	325	Effluent	43	29	11.1	1	0	23	254	254	364
Field 1	Small Grain Silage	8-9 T	95	43	25	39	70	Effluent	43	29	2.4	1	0	23	55	55	44
Field 1	Forage Sorghum	5-6 T	240	83	25	168	215	Effluent	43	29	7.3	1	0	23	168	168	205
Field 1	Sorghum Silage	16-20 T	280	74	25	238	255	Effluent	43	29	8.7	1	0	23	200	200	293
Field 2	Corn Silage	21-25 T	350	96	25	294	325	Effluent	43	29	11.1	1	0	23	254	254	363
Field 2	Small Grain Silage	8-9 T	95	43	25	38	70	Effluent	43	29	2.4	1	0	23	55	55	43
Field 2	Forage Sorghum	5-6 T	240	83	25	166	215	Effluent	43	29	7.3	1	0	23	168	168	203
Field 2	Sorghum Silage	16-20 T	280	74	25	237	255	Effluent	43	29	8.7	1	0	23	200	200	291
Field 3	Corn Silage	21-25 T	350	96	25	284	325	Effluent	43	29	11.1	1	0	23	254	254	353
Field 3	Small Grain Silage	8-9 T	95	43	25	28	70	Effluent	43	29	2.4	1	0	23	55	55	33
Field 3	Forage Sorghum	5-6 T	240	83	25	156	215	Effluent	43	29	7.3	1	0	23	168	168	193
Field 3	Sorghum Silage	16-20 T	280	74	25	227	255	Effluent	43	29	8.7	1	0	23	200	200	281
Manure									lb/Ton	lb/Ton	Ton/Ac			lb/Ton			
Field 4	Corn Silage	21-25 T	350	96	25	271	325	Manure	17	10	32.9	1	0	9	310	310	365
Field 4	Small Grain Silage	8-9 T	95	43	25	0	70	Manure	17	10	7.1	1	0	9	67	67	10
Field 4	Forage Sorghum	5-6 T	240	83	25	108	215	Manure	17	10	21.8	1	0	9	205	205	161
Field 4	Sorghum Silage	16-20 T	280	74	25	190	255	Manure	17	10	25.9	1	0	9	243	243	264
Field 5	Corn Silage	21-25 T	350	96	25	280	325	Manure	17	10	32.9	1	0	9	310	310	373
Field 5	Small Grain Silage	8-9 T	95	43	25	1	70	Manure	17	10	7.1	1	0	9	67	67	11
Field 5	Forage Sorghum	5-6 T	240	83	25	131	215	Manure	17	10	21.8	1	0	9	205	205	185
Field 5	Sorghum Silage	16-20 T	280	74	25	210	255	Manure	17	10	25.9	1	0	9	243	243	284
Field 6	Corn Silage	21-25 T	350	96	25	280	325	Manure	17	10	32.9	1	0	9	310	310	373
Field 6	Small Grain Silage	8-9 T	95	43	25	0	70	Manure	17	10	7.1	1	0	9	67	67	10
Field 6	Forage Sorghum	5-6 T	240	83	25	115	215	Manure	17	10	21.8	1	0	9	205	205	168
Field 6	Sorghum Silage	16-20 T	280	74	25	194	255	Manure	17	10	25.9	1	0	9	243	243	267

Notes:

(1) Crop Nutrient Needs, lbs/ac and based on Crop Requirement tables utilized by the Texas NRCS Code 590. New Mexico specific information in non existant and cropping mechanisms are similar for west Texas and eastern NM.

(2) Should be taken from annual soil tests results. Years 2-5 are projected until results are obtained.

(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) Column H* Column K = lb/Ac of P2O5 applied.

(10) Projected end of year ppm P based on the application rates established in this spreadsheet.

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

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	Stark Dairy	**Field(s):**	LMU 1	**Date:**	2010
Planner:	EAE	**Location:**	Curry County	**Crop:**	Sorghum
Soil Permeablity (in/hr):	2	**Slope (%):**	1.4	**Planned/Exist.:**	Existing

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		4
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		4
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			3
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					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
	X					0

P Hazard Class:	Low	**Total Index Points:**	12.0
Phosphorus Application Classification:	N Based		

Notes:

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

Comments: A >100 foot vegetative buffer was utilized since this facility does not reside in proximity to named stream or lake.

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	Stark Dairy	**Field(s):**	LMU 2	**Date:**	2010
Planner:	EAE	**Location:**	Curry County	**Crop:**	Wheat
Soil Permeablity (in/hr):	2	**Slope (%):**	1.3	**Planned/Exist.:**	Existing

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		4
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			3
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					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
	X					0

P Hazard Class:	Low	**Total Index Points:**	16.0
Phosphorus Application Classification:	N Based		

Notes:

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

Comments: A >100 foot vegetative buffer was utilized since this facility does not reside in proximity to named stream or lake.

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	**Stark Dairy**	**Field(s):**	**LMU 3**	**Date:**	**2010**
Planner:	**EAE**	**Location:**	**Curry County**	**Crop:**	**Wheat**
Soil Permeablity (in/hr):	**2**	**Slope (%):**	**1.4**	**Planned/Exist.:**	**Existing**

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			2
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		4
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			3
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					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
	X					0

P Hazard Class:	**Low**	**Total Index Points:**	**10.0**
Phosphorus Application Classification:	**N Based**		

Notes:

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

Comments: A >100 foot vegetative buffer was utilized since this facility does not reside in proximity to named stream or lake.

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	**Stark Dairy**	**Field(s):**	**LMU 4**	**Date:**	**2010**
Planner:	**EAE**	**Location:**	**Curry County**	**Crop:**	**Wheat**
Soil Permeability (in/hr):	**2**	**Slope (%):**	**0.8**	**Planned/Exist.:**	**Existing**

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					0
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			3
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					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
	X					0

P Hazard Class:	**Low**	**Total Index Points:**	**13.0**
Phosphorus Application Classification:	**N Based**		

Notes:

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

Comments: A >100 foot vegetative buffer was utilized since this facility does not reside in proximity to named stream or lake.

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	**Stark Dairy**	**Field(s):**	**LMU 5**	**Date:**	**2010**
Planner:	**EAE**	**Location:**	**Curry County**	**Crop:**	**Corn**
Soil Permeability (in/hr):	**2**	**Slope (%):**	**0.9**	**Planned/Exist.:**	**Existing**

Site Characteristic	**Place an X in the appropriate box for each of the Site Characteristic listed below.**					**Sub Total**
Soil Test P Level	Very Low <8 ppm	Low 8-15 ppm	Moderate >15-23 ppm	High >23-30 ppm	Very High >30 ppm	
				X		4
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					0
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			3
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					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
	X					0

P Hazard Class:	**Very Low**	**Total Index Points:**	**9.0**
Phosphorus Application Classification:	**N Based**		

Notes:

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

Comments: A >100 foot vegetative buffer was utilized since this facility does not reside in proximity to named stream or lake.

PHOSPHORUS INDEX WORKSHEET for New Mexico

Client Name:	**Stark Dairy**	**Field(s):**	**LMU 6**	**Date:**	**2010**
Planner:	**EAE**	**Location:**	**Curry County**	**Crop:**	**Wheat**
Soil Permeablity (in/hr):	**2**	**Slope (%):**	**1.2**	**Planned/Exist.:**	**Existing**

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			2
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					0
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			3
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					0
Vegetative Buffer	> 100 ft wide	>65-100 ft wide	20-65 feet wide	< 20 feet wide	No Buffer	
	X					0

P Hazard Class:	**Very Low**	**Total Index Points:**	**7.0**
Phosphorus Application Classification:	**N Based**		

Notes:

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

Comments: A >100 foot vegetative buffer was utilized since this facility does not reside in proximity to named stream or lake.

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 0-12 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=lbs/ac)**	**N = 52** **P = 28 ppm (112 lb/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)**	**240 lb/Ac N** **83 lb/Ac P2O5**
3	Determine remaining nutrients needed for crop requirement, (lbs-N/ac or lbs-P2O5) **= (Line 2 -Line 1)**	**N = 188** **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 = 43** **P2O5 = 23**
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 = 29** **P2O5 = 23**
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**	**0.54**
8	Conversion to total gallons **=(Line 7 x 325,851)**	**176,034**
9	Conversion to acre-inches per acre **=(Line 3/ Line 5)**	**6.48**

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 0-12 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)**	**N = 52** **P = 28 ppm (112 lb/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)**	**240 lb/Ac N** **83 lb/Ac P2O5**
3	Determine remaining nutrients needed for crop requirement, (lbs-N/ac) **= (Line 2 -Line 1)**	**N = 188** **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=17.2 lb/T** **P2O5=9.4 lb/T**
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**	**N=9.9 lb/T** **P2O5=9.4 lb/T**
6	Enter the amount of solid manure to be applied, (tons/acre) = **(Line 3) / (Line 5)**	**18.99 T/Ac**

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 first annual report shall be submitted on the 28th day of the 12th month after the permittee's NOI was submitted for coverage under this general permit, and every twelve (12) months, thereafter.

Addresses for submitting required reports:

EPA Region 6: Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN-W)
U.S. EPA, Region 6
P.O. Box 50625
Dallas, TX 75250

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)	Semi-Solids (Slurry)	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.

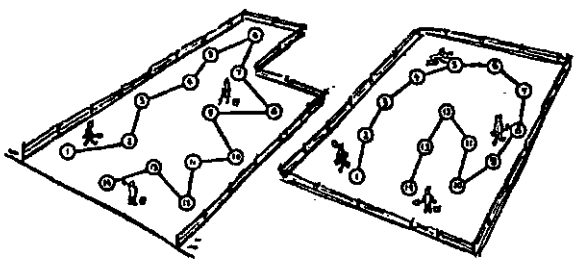
A clean bucket or other suitable container. Do not use a container made of metal.

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.

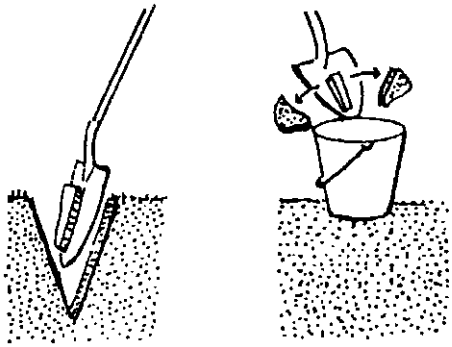
For a composite sample, take soil from at least five sites in a garden or lawn and up to 15 sites in a large field (as illustrated in the diagram). Avoid areas near a road, fence row, compost pile, fertilizer band, or other non-typical areas. *(Image not available. Please contact NMSU Agricultural Communications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



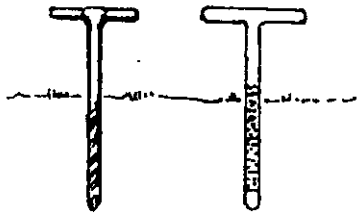
How to Sample

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

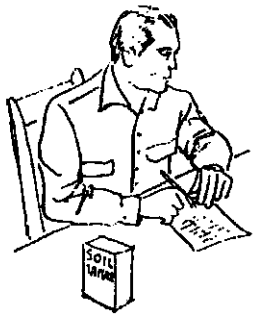
If you use a shovel and a knife, dig a hole about six inches deep. Take a slice of soil one-half inch thick and six inches deep and keep it on the shovel. From the center of this slice, cut a strip one-half inch wide from top to bottom and put it in the bucket. Repeat this at each site in the field.



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.*

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	Southern yew
E.C. x 10^3 = <2	Glossy abelia
	Photinia
	Rose
	Chinese holly
	Star jasmine
	Pyrenees cotoneaster
Sensitive	Laurustinus
E.C. x 10^3 = 2–3 or 4	Chinese hibiscus
	Heavenly bamboo
	Japanese pittosporoum
	Algerian ivy
Moderatley tolerant	Spreading juniper
E.C. x 10^3 = 4–5 or 6	Pyracantha
	Thorny elaeagnus
	Oriental arborvitae
	Indian hawthorn
	Japanese black pine
	Japanese boxwood
	Yellow sage
Moderately tolerant (con't)	Glossy privet
Tolerant	Aleppo pine
E.C. x 10^3 = 6–8	European fan palm
	Rosemary
	Spindle tree
	Blue dracaena
	Oleander
Most tolerant	Croceum iceplant
E.C. x 10^3 = 8–10	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.

Reprinted May 2000

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): Mike Stark

Title (Type or Print): Owner

Phone No.: (575)985-0192

Signature: Michael Stark

Date: 11-17-09

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).

Electronic Code of Federal Regulations

e-CFR™

e-CFR Data is current as of July 31, 2009

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

(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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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.

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 NEW SOURCE REVIEW

February 17, 2010

MEMORANDUM

Subject: NEPA Process Completion Notice for the
Proposed Coverage of the New Source Concentrated Animal Feeding Operation
Under General NPDES Permit NMG010000

From: Hector Pena, Project Manager
Office of Planning and Coordination (6EN-XP)

To: Willie Lane, Chief
Water Quality Protection Section (6WQ-PP)

The 30-day comment period for the Finding of No Significant Impact for the Stark Dairy operation near Clovis, Curry County, New Mexico, has expired without any comment to alter the preliminary finding. The Public Notice was issued on January 14, 2010.

Attached for your files are copies of the Finding of No Significant Impact, the Environmental Assessment, and this notice of completion of the review process. **Please send copies of these documents to your primary customers, and any other appropriate agency, for their records.**

Thank you for your assistance in the review process. If you have any questions on this matter, please contact Hector Pena at (214) 665-7453.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

January 7, 2010

FINDING OF NO SIGNIFICANT IMPACT

To All Interested Government Agencies and Public Groups:

In accordance with the environmental review guidelines of the Council on Environmental Quality found at 40 Code of Federal Regulations (CFR) Part 1500, and the implementing procedures of the U.S. Environmental Protection Agency (EPA) at 40 CFR Part 6, *Procedures for Implementing the Requirements of the Council on Environmental Quality on the National Environmental Policy Act*, for the New Source National Pollutant Discharge Elimination System (NPDES) Program, the EPA has performed an environmental assessment for the proposed coverage under General NPDES Permit NMG010000 for a New Source Concentrated Animal Feeding Operation.

Applicant: Stark Dairy
P.O. Box 949
Clovis, Curry County, New Mexico 88101

Type of Facility: Concentrated Animal Feeding Operation (CAFO).

Location: East-central New Mexico, about 12 miles north of Clovis, at Latitude 34.5933°, Longitude 103.1834°, in the NE/4 of Section 8, T4N-R36E, the NW/4, S/2 of Section 8, T4N-R36E, NW/4, SW/4 & SE/4 of Section 9, T4N-R36E, and S/Pt (100 acres) of Section 10, T4N-R36E.

The Stark Dairy operation was constructed in 2003, and is a New Source Operation subject to the New Source Performance Standards (NSPS) promulgated on April 14, 2003. The dairy has been operating in compliance with the NSPS. However, with the issuance of the General NPDES Permit for CAFOs, as defined at 40 CFR Part 412, on August 4, 2009, Stark Dairy may submit a Notice of Intent (NOI) to apply for coverage under the General Permit. For new sources, the NOI triggers the environmental assessment process under the National Environmental Policy Act.

Stark Dairy houses 8,500 head of cattle consisting of 3,500 milk cows, and 5,000 dry cows, heifers, and young stock. The dairy operation covers approximately 1,180 acres and consists of the land application fields, a milking center, office buildings, with the commodity area and silage located southwest of the dairy pens. The herd is fed from concrete bunks and kept in unpaved pens in open lot areas. The pens are constructed of steel pipe and laid out in rows, oriented in a north-south direction. Each row of pens are separated by cattle transfer alleys and paved feed alleys. The herd is milked two or three times daily and the milk is transported by commercial tankers to a third-party for further processing.

Finding. EPA Region 6 has performed an environmental review and assessment on the Environmental Information Document prepared by Enviro-Ag Engineering, and other supporting data. The environmental review and assessment process did not identify any potentially significant adverse environmental impacts associated with the proposed action. The project individually, cumulatively over time, or in conjunction with other actions will not have a significant adverse effect on the quality of the human environment. Accordingly, EPA Region 6 has made preliminary determination that the proposed project is not a major federal action significantly affecting the quality of the human environment, and that preparation of an Environmental Impact Statement (EIS) is not warranted.

Comments regarding this preliminary decision not to prepare an EIS and issue a Finding of No Significant Impact (FNSI) may be submitted to the U.S. Environmental Protection Agency, Office of Planning and Coordination (6EN-XP), 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202-2733. All comments will be taken into consideration. No administrative action will be taken on this decision during the 30-day comment period. This preliminary decision and the FNSI will become final after the 30-day comment period expires if no new information is provided to alter this finding. Address all comments and requests for review of the administrative record supporting this determination to: Office of Planning and Coordination (6EN-XP), U.S. Environmental Protection Agency, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202-2733, Telephone: (214) 665-8150.

Responsible Official,

John Blevins
Director
Compliance Assurance and
Enforcement Division

Enclosure

ENVIRONMENTAL ASSESSMENT
FOR THE PROPOSED COVERAGE TO
STARK DAIRY, CURRY COUNTY, NEW MEXICO
UNDER GENERAL NPDES PERMIT NMG010000
FOR THE STATE OF NEW MEXICO

1.0 GENERAL PROJECT INFORMATION

1.1 Purpose and Need for Proposed Action. The Stark Dairy operation was constructed in 2003, and is a New Source Operation subject to the New Source Performance Standards (NSPS) promulgated on April 14, 2003. The dairy has been operating in compliance with the NSPS. However, with the issuance of the General National Pollutant Discharge Elimination System (NPDES) Permit for Concentrated Animal Feeding Operations, as defined at 40 CFR Part 412, on August 4, 2009, Stark Dairy may submit a Notice of Intent (NOI) to apply for coverage under the General Permit. The NOI triggers the environmental assessment process for new sources under the National Environmental Policy Act.

1.2 Proposed Action. Stark Dairy houses 8,500 head of cattle consisting of 3,500 milk cows, and 5,000 dry cows, heifers, and young stock. It is located in the east-central portion of New Mexico, about 12 miles north of Clovis, Curry County, New Mexico, at Latitude 34.5933°, Longitude 103.1834°. The dairy and land application fields cover approximately 1,180 acres in the NE/4 of Section 8, T4N-R36E, the NW/4, S/2 of Section 8, T4N-R36E, NW/4, SW/4 & SE/4 of Section 9, T4N-R36E, and S/Pt (100 acres) of Section 10, T4N-R36E. The facility consists of a milking center, office buildings, with the commodity area and silage located southwest of the dairy pens. The herd is kept in unpaved pens in open lot areas and fed from concrete bunks located on either side of the feed alleys. The pens are constructed of steel pipe and laid out in rows, oriented in a north-south direction. Each row of pens are separated by cattle transfer alleys and paved feed alleys. The herd is milked two or three times daily with automated milking machines. Milk is pumped from the milking barns into processing rooms where it is filtered, cooled, and stored in bulk milk tanks. The milk is then transported by commercial milk tankers and delivered to a third-party for additional processing.

2.0 ALTERNATIVES

2.1 Environmental Clearance of the Dairy Facility for Permitting. EPA can make a determination of No Significant Impact and clear the facility as presented for permitting under the General NPDES permit.

2.2 Funding of a Modified Project. Information received during the EA process could result in the identification of significant adverse impacts that require mitigation through modification of the proposed action. Modification of the project to mitigate the impacts may allow the EPA to clear the facility as modified for coverage under the General NPDES permit.

2.3 No Action. A determination that the facility as presented could result in potentially significant adverse impacts to the environment that cannot be satisfactorily mitigated would preclude clearance for coverage under the General NPDES permit. Instead, an EIS would be recommended to evaluate the potentially significant impacts. The EIS process includes a scoping meeting to identify critical facts and issues, a Draft EIS, a public comment period on the Draft EIS, a public hearing on the Draft EIS, the Final EIS, a public comment period on the Final EIS, and a Record of Decision. Under this alternative, the facility would potentially not be covered under the NPDES permitting program, leaving the facility in non-compliance with federal regulations.

2.4 Recommendation. Based upon the review of the Environmental Information Document prepared by Enviro-Ag Engineering, this EA and accompanying documentation, and comments from the interested public, the recommended alternative is Environmental Clearance of the Dairy Facility for coverage under General NPDES Permit NMG010000, and issuance of a Finding of No Significant Impact.

3.0 AFFECTED ENVIRONMENT

3.1 Land Use. The dairy complex itself consists of about 160 acres of land historically used for farmland. The land is flat, containing playa basins and drainage draws. Site elevations range from 4450 feet at the northwest corner, to 4432 at the southeast corner. Land use is rural, with beef production, dairy operations and irrigated farmland surrounding the dairy site. Soils in the dairy area are 95 percent Olton clay loams (0-1% slopes). The Olton soils are rated as prime farmland, if irrigated.

3.2 Water Resources. The dairy operation is situated on the High Plains of New Mexico, within the drainage basin of the Brazos River in Texas. Drainage from the area is localized to playa lakes scattered over the flat surface. Drainage from the project site is to a playa immediately to the north. The feedlot operation is adjacent to the northern perimeter of this playa. Playas are normally dry, except after rainfall events. The nearest continuous drainage is the ephemeral Running Water Draw, about three miles to the north of the dairy operation.

Storm runoff from the open lot areas is channeled to a two-stage system of wastewater retention control structures (RCS). Waste and wastewater generated in the milking barn are flushed to a solids separation system. The wastewater is then allowed to flow to the RCS, where it combines with process water used to chill the milk for use to flush the system. The wastewater and runoff water from the lagoons are used for irrigation of crops or allowed to evaporate.

The primary water supply for the High Plains region is ground water from the unconfined Ogallala Formation which was deposited during the late Miocene and Pliocene times. The formation consists primarily of sand silt, clay and gravel from the southern Rocky Mountains to the west. Triassic age rocks are the principle geologic units underlying the Ogallala Formation in central Curry County. Depth to water in the general area ranges from approximately 299 to 442 feet below the ground surface. Ground water use in the region includes public and domestic

water supply, crop irrigation, and livestock watering. The dairy is in an area of extensive use of the Ogallala for irrigation. Stark Dairy has water right permits from the state of New Mexico under the Water Resources Allocation Program.

3.3 Flood Plain Management and Wetland Protection. According to the Flood Hazard Boundary Map, there are no flood plain areas or wetland resources within the dairy production or land application fields. There is a playa basin at the northeast of a land application field, and a small depression that is actively farmed located south of the retention facility.

3.4 Ambient Air Quality. There are two houses within a mile of the dairy, one to the northwest and the other to the southeast. The prevailing wind pattern is from the southwest. Elevated levels of fugitive dust are associated primarily with the occasional dust storms. Pen and vehicular fugitive road dust emissions are controlled by the use of compacted gravel roads at the dairy complex. The facility uses best available control technology, including feed handling techniques which minimize particulate emissions. Noise generated by milking, cleaning, feed preparation and delivery is in the commodity area located away from the residences. RCS #1 is designed and operated to minimize odors, and with evaporation losses together with the irrigation to nearby fields, odors normally disperse before reaching the two receptors. Manure scraped from feed alleys is disposed by contract haulers and spread on neighboring farmland at agronomic rates. The manure is disked into the soil as soon as possible to reduce odors and vectors.

3.5 Biological Resources. The natural vegetation in the area consists of irrigated crops. Areas not irrigated are considered dryland farms. Rangeland surrounding the dairy complex is mostly prairie grasses and mixture of sagebrush and cactus. Overgrazing has led to snakeweed and mesquite dominance of the brushy areas. There is no consistent source of surface water in this portion of the county. Playas, the RCS ponds, and irrigation practices provide a water source for wildlife, which includes antelope, jackrabbits, skunks, ground squirrels, prairie dogs, quail, dove, pheasant, lesser prairie chickens, various song birds, and predators such hawks and coyotes. Birds, such as ducks, geese and cranes may migrate through the area. The U.S. Fish and Wildlife Service has indicated that no known endangered or threatened species or critical habitat areas exist within the diary site.

3.6 Cultural Resources. A review of the New Mexico Historic Preservation Division and National Register of Historic Sites indicates that no listed properties are located near the dairy.

3.7 Socio-economics. The economy of Curry County is based on agriculture, railroad, military and light manufacturing, with dairy operations as the primary industry. New Mexico is the fastest-growing dairy state in the country, now ranked fourteenth in milk production. Most of this growth has been in the southeast portion of the state.

3.8 Cumulative Impacts. There are three other dairies within two miles of Stark Dairy. The potential for an induced cumulative odor problem may result from the growing number and concentration of CAFOs.

4.0 OTHER ENVIRONMENTAL CONSIDERATIONS

4.1 Unavoidable Adverse Impacts. Unavoidable adverse impacts from the project are primarily the dust and vehicular exhaust emissions, and the potential noise and odors generated. Improper handling of the manure could result in adverse effects via ground, surface, and storm water runoff contamination. Areas potentially affected could include land, water, and air resources, and infrastructures. Beneficial impacts could result through an increase in the monetary base of the area.

4.2 Relationship Between Local, Short Term Use of the Environment and the Maintenance/enhancement of Long Term Beneficial Uses. In addition to grain and economic resources, the dairy operation commits roughly 1,180 acres, of which 160 acres are developed with built-up dairy facilities. Although not a permanent loss, the cumulative loss of prime farmland soils constitutes a long-term adverse impact on the availability of prime farmland soils.

4.3 Irreversible and Irretrievable Commitment of Resources. Irreversible and irretrievable commitment of resources includes the material, land, energy and financial resources used in the construction and operation of the facility.

5.0 MAPS AND LIST OF AGENCIES CONTACTED

U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
U.S. Soil Conservation Service
New Mexico Department of Agriculture
New Mexico Department of Game and Fish
New Mexico State Historical Preservation Officer
New Mexico Environment Department
New Mexico State Engineer Office

6.0 REFERENCES

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Curry County - Local Area Information. Website accessed 3/5/09.

Encyclopedia Britannica - Clovis. Website accessed 3/10/09.

Enviro-Ag Engineering. 2009. Environmental Information Document for Stark Dairy, Clovis, New Mexico.

Meinzer, O.E. 1968. *The Occurrence of Groundwater in the United States.* Geological Water Supply Paper #489. United States Department of the Interior.

Natural Heritage of New Mexico - *NHNM Species Information.* Website accessed 3/11/09.

NM Historical Preservation Division. - *Register of Cultural Properties.* Website accessed 3/11/09.

NM Home Town Locator - *New Mexico National Historic Landmark.* Website accessed 3/10/09.

NM Museum of Natural History & Science - *Mammals of New Mexico.* Website accessed 3/10/09.

NM Office of the State Engineer - *Waters Web System.* Website accessed August 2008.

NM Rare Plants - *County Search.* Website accessed 3/11/09.

National Register Information System. Website accessed 3/11/09.

Sellars, E.H., Adkins, W.S., and Plummer, F.B. 1954. *The Geology of Texas, V-I.* The University of Texas Bulletin #3232.

U.S. Depart. of Agriculture - *Web Soil Survey.* Website accessed 3/4/09.

U.S. Fish and Wildlife Service - *National Wetlands Inventory.* Website accessed 3/5/09.

U.S. Fish and Wildlife Service - *Threatened & Endangered Species System.* Website accessed 3/11/09.

SECTION 12 RECORD KEEPING FORMS

12.1 Soil and Manure/Wastewater Nutrient Analysis

Olsen's Agricultural Laboratory, Inc.

210 East 1st / PO Box 370 / McCook, Nebraska 69001
Office: 308-345-3670 / FAX: 308-345-7880
www.olsenlab.com

40290
GARY CHAPMAN
ENVIRO AG ENGINEERING INC
3404 AIRWAY BOULEVARD
AMARILLO TX 79118

NAME : STARK AND SONS DAIRY DATE RECEIVED: 05/10/2010 DATE REPORTED: 05/13/2010

SOIL TEST RESULTS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	Depth Inches	pH 1 : 1 Soil	pH Buffer Woodruff	LIME REC T/A 60% ECCE Legume	LIME REC T/A 60% ECCE Non Legume	EL	SOLUBLE SALTS mod. SP mmhos/cm	OM LOI %	NITRATE-N (FIA) ppm	NITRATE-N (FIA) lbs/A	PHOSPHORUS P1 ppm	PHOSPHORUS Bicarb ppm	PHOSPHORUS P2 ppm	PHOSPHORUS M2 ppm	PHOSPHORUS M3 ppm
895042		FIELD 1	0-12	7.7				N	0.92	1.6	2.4	9		28			
895043		FIELD 1	12-24	8.0				H	1.06	1.3	4.2	15		10			
895044		FIELD 1	24-36	8.1				H	1.04	1.1	7.9	28		14			

LAB NUMBER	SULFATE-S Ca-P ppm	NH4OAc (Exchangeable) K ppm	Ca ppm	Mg ppm	Na ppm	DTPA Zn ppm	Fe ppm	Mn ppm	Cu ppm	BORON Sorbitol ppm	EST. CATION EXCHANGE CAPACITY (CEC) me/100g	% SATURATION BASE	H	Ca	Mg	K	Na
895042	18	514				1.2				1.5							
895043	23	282				0.2				1.5							
895044	24	301				0.4				1.8							

LAB NUMBER	SOLUBLE (SAT. EXT.) Ca me/L	Mg me/L	Na me/L	SODIUM ADSORPTION RATIO (SAR)	EXCH. SODIUM PERCENT (ESP)	GYPSUM REQ T/A	PARTICLE SIZE ANALYSIS SAND %	SILT %	CLAY %	SOIL TEXTURE	CHLORIDE ppm	CHLORIDE lbs/A	EXCH. NH4-N ppm	EXCH. NH4-N lbs/A	ALUMINUM ppm	TOTAL N %
895042	3.77	2.32	8.20	4.70	6	0.0					18.3	66				0.080
895043	2.72	1.09	3.43	2.49	2	0.0					31.7	114				0.059
895044	2.55	1.21	2.88	2.10	2	0.0					21.9	79				0.021

SUGGESTED FERTILIZER RECOMMENDATIONS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	CROP TO BE GROWN	YIELD GOAL	N lbs/A	P2O5 lbs/A	K2O lbs/A	S lbs/A	Zn lbs/A	MgO lbs/A	Fe lbs/A	Mn lbs/A	Cu lbs/A	B lbs/A	Cl lbs/A
895042		FIELD 1													

Analysis By: Olsen's Ag. Lab Recommendations By: Olsen's Ag. Lab

Olsen's Agricultural Laboratory, Inc.

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AMARILLO TX 79118

NAME : STARK AND SONS DAIRY DATE RECEIVED: 05/10/2010 DATE REPORTED: 05/13/2010

SOIL TEST RESULTS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	Depth Inches	pH 1 : 1 Soil	pH Buffer Woodruff	LIME REC T/A 60% ECCE Legume	LIME REC T/A 60% ECCE Non Legume	EL	SOLUBLE SALTS mod. SP mmhos/cm	OM LOI %	NITRATE-N (FIA) ppm	NITRATE-N (FIA) lbs/A	PHOSPHORUS P1 ppm	PHOSPHORUS Bicarb ppm	PHOSPHORUS P2 ppm	PHOSPHORUS M2 ppm	PHOSPHORUS M3 ppm
895045		FIELD 2	0-12	7.9				N	0.88	1.7	4.3	15		33			
895046		FIELD 2	12-24	7.9				H	1.18	1.4	7.0	25		11			
895047		FIELD 2	24-36	7.9				H	1.04	1.1	8.7	31		13			

LAB NUMBER	SULFATE-S Ca-P ppm	NH4OAc (Exchangeable) K ppm	NH4OAc (Exchangeable) Ca ppm	NH4OAc (Exchangeable) Mg ppm	NH4OAc (Exchangeable) Na ppm	DTPA Zn ppm	DTPA Fe ppm	DTPA Mn ppm	DTPA Cu ppm	BORON Sorbitol ppm	EST. CATION EXCHANGE CAPACITY (CEC) me/100g	% SATURATION BASE	% SATURATION H	% SATURATION Ca	% SATURATION Mg	% SATURATION K	% SATURATION Na
895045	18	631				1.1				1.4							
895046	31	351				0.3				1.5							
895047	27	330				0.4				1.6							

LAB NUMBER	SOLUBLE (SAT. EXT.) Ca me/L	SOLUBLE (SAT. EXT.) Mg me/L	SOLUBLE (SAT. EXT.) Na me/L	SODIUM ADSORPTION RATIO (SAR)	EXCH. SODIUM PERCENT (ESP)	GYPSUM REQ T/A	PARTICLE SIZE ANALYSIS SAND %	SILT %	CLAY %	SOIL TEXTURE	CHLORIDE ppm	CHLORIDE lbs/A	EXCH. NH4-N ppm	EXCH. NH4-N lbs/A	ALUMINUM ppm	TOTAL N %
895045	2.68	1.41	4.37	3.06	3	0.0					19.2	69				0.092
895046	3.33	1.37	3.58	2.34	2	0.0					41.7	150				0.064
895047	1.94	0.83	2.40	2.04	2	0.0					27.6	99				0.043

SUGGESTED FERTILIZER RECOMMENDATIONS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	CROP TO BE GROWN	YIELD GOAL	N lbs/A	P2O5 lbs/A	K2O lbs/A	S lbs/A	Zn lbs/A	MgO lbs/A	Fe lbs/A	Mn lbs/A	Cu lbs/A	B lbs/A	Cl lbs/A
895045		FIELD 2													

Analysis By: Olsen's Ag. Lab Recommendations By: Olsen's Ag. Lab

Olsen's Agricultural Laboratory, Inc.

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AMARILLO TX 79118

NAME : STARK AND SONS DAIRY DATE RECEIVED: 05/10/2010 DATE REPORTED: 05/13/2010

SOIL TEST RESULTS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	Depth Inches	pH 1 : 1 Soil	pH Buffer Woodruff	LIME REC T/A 60% ECCE Legume	LIME REC T/A 60% ECCE Non Legume	EL	SOLUBLE SALTS mod. SP mmhos/cm	OM LOI %	NITRATE-N (FIA) ppm	NITRATE-N (FIA) lbs/A	PHOSPHORUS P1 ppm	PHOSPHORUS Bicarb ppm	PHOSPHORUS P2 ppm	PHOSPHORUS M2 ppm	PHOSPHORUS M3 ppm
895048		FIELD 3	0-12	7.8				N	0.90	1.4	4.1	15		21			
895049		FIELD 3	12-24	7.9				H	1.10	1.1	6.1	22		9			
895050		FIELD 3	24-36	8.0				H	1.10	0.9	7.8	28		10			

LAB NUMBER	SULFATE-S Ca-P ppm	NH4OAc (Exchangeable) K ppm	Ca ppm	Mg ppm	Na ppm	DTPA Zn ppm	Fe ppm	Mn ppm	Cu ppm	BORON Sorbitol ppm	EST. CATION EXCHANGE CAPACITY (CEC) me/100g	% SATURATION BASE	H	Ca	Mg	K	Na
895048	14	446				0.8				1.4							
895049	22	299				0.3				1.6							
895050	23	319				0.4				1.8							

LAB NUMBER	SOLUBLE (SAT. EXT.) Ca me/L	Mg me/L	Na me/L	SODIUM ADSORPTION RATIO (SAR)	EXCH. SODIUM PERCENT (ESP)	GYPSUM REQ T/A	PARTICLE SIZE ANALYSIS SAND %	SILT %	CLAY %	SOIL TEXTURE	CHLORIDE ppm	CHLORIDE lbs/A	EXCH. NH4-N ppm	EXCH. NH4-N lbs/A	ALUMINUM ppm	TOTAL N %
895048	2.44	1.11	3.18	2.39	2	0.0					14.0	50				0.062
895049	2.94	1.24	3.27	2.26	2	0.0					34.6	125				0.052
895050	3.06	1.47	2.42	1.61	1	0.0					30.9	111				0.032

SUGGESTED FERTILIZER RECOMMENDATIONS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	CROP TO BE GROWN	YIELD GOAL	N lbs/A	P2O5 lbs/A	K2O lbs/A	S lbs/A	Zn lbs/A	MgO lbs/A	Fe lbs/A	Mn lbs/A	Cu lbs/A	B lbs/A	Cl lbs/A
895048		FIELD 3													

Analysis By: Olsen's Ag. Lab Recommendations By: Olsen's Ag. Lab

Olsen's Agricultural Laboratory, Inc.

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GARY CHAPMAN
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AMARILLO TX 79118

NAME : ENVIRO AG ENGINEERING DATE RECEIVED: 05/26/2010 DATE REPORTED: 05/28/2010

SOIL TEST RESULTS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	Depth Inches	pH 1 : 1 Soil	pH Buffer Woodruff	LIME REC T/A 60% ECCE Legume	LIME REC T/A 60% ECCE Non Legume	EL	SOLUBLE SALTS mod. SP mmhos/cm	OM LOI %	NITRATE-N (FIA) ppm	NITRATE-N (FIA) lbs/A	PHOSPHORUS P1 ppm	PHOSPHORUS Bicarb ppm	PHOSPHORUS P2 ppm	PHOSPHORUS M2 ppm	PHOSPHORUS M3 ppm
895482	FIELD 4		0-12	7.7				M	1.28	1.7	21.3	77		39			
895483	FIELD 4		12-24	7.8				H	1.60	1.2	50.2	181		5			
895484	FIELD 4		24-36	8.0				H	1.24	0.9	38.2	138		6			

LAB NUMBER	SULFATE-S Ca-P ppm	NH4OAc (Exchangeable) K ppm	NH4OAc (Exchangeable) Ca ppm	NH4OAc (Exchangeable) Mg ppm	NH4OAc (Exchangeable) Na ppm	DTPA Zn ppm	DTPA Fe ppm	DTPA Mn ppm	DTPA Cu ppm	BORON Sorbitol ppm	EST. CATION EXCHANGE CAPACITY (CEC) me/100g	% SATURATION BASE	% SATURATION H	% SATURATION Ca	% SATURATION Mg	% SATURATION K	% SATURATION Na
895482	11	581				1.2				1.5							
895483	10	272				0.2				1.5							
895484	6	258				0.4				1.9							

LAB NUMBER	SOLUBLE (SAT. EXT.) Ca me/L	SOLUBLE (SAT. EXT.) Mg me/L	SOLUBLE (SAT. EXT.) Na me/L	SODIUM ADSORPTION RATIO (SAR)	EXCH. SODIUM PERCENT (ESP)	GYPSUM REQ T/A	PARTICLE SIZE ANALYSIS SAND %	SILT %	CLAY %	SOIL TEXTURE	CHLORIDE ppm	CHLORIDE lbs/A	EXCH. NH4-N ppm	EXCH. NH4-N lbs/A	ALUMINUM ppm	TOTAL N %
895482	3.62	2.11	3.15	1.86	1	0.0					14.1	51				0.094
895483	6.14	2.76	4.12	1.95	2	0.0					42.1	152				0.052
895484	5.09	2.34	3.66	1.90	2	0.0					38.1	137				0.036

SUGGESTED FERTILIZER RECOMMENDATIONS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	CROP TO BE GROWN	YIELD GOAL	N lbs/A	P2O5 lbs/A	K2O lbs/A	S lbs/A	Zn lbs/A	MgO lbs/A	Fe lbs/A	Mn lbs/A	Cu lbs/A	B lbs/A	Cl lbs/A
895482	FIELD 4														

Analysis By: Olsen's Ag. Lab Recommendations By: Olsen's Ag. Lab

Olsen's Agricultural Laboratory, Inc.

210 East 1st / PO Box 370 / McCook, Nebraska 69001
Office: 308-345-3670 / FAX: 308-345-7880
www.olsenlab.com

40290
GARY CHAPMAN
ENVIRO AG ENGINEERING INC
3404 AIRWAY BOULEVARD
AMARILLO TX 79118

NAME : STARK AND SONS DAIRY DATE RECEIVED: 05/10/2010 DATE REPORTED: 05/13/2010

SOIL TEST RESULTS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	Depth Inches	pH 1 : 1 Soil	pH Buffer Woodruff	LIME REC T/A 60% ECCE Legume	LIME REC T/A 60% ECCE Non Legume	EL	SOLUBLE SALTS mod. SP mmhos/cm	OM LOI %	NITRATE-N (FIA) ppm	NITRATE-N (FIA) lbs/A	PHOSPHORUS P1 ppm	PHOSPHORUS Bicarb ppm	PHOSPHORUS P2 ppm	PHOSPHORUS M2 ppm	PHOSPHORUS M3 ppm
895051		FIELD 5	0-12	7.9				N	1.28	1.7	41.0	148		25			
895052		FIELD 5	12-24	8.1				H	1.14	1.0	19.4	70		11			
895053		FIELD 5	24-36	8.1				H	1.14	1.3	32.0	115		8			

LAB NUMBER	SULFATE-S Ca-P ppm	NH4OAc (Exchangeable) K ppm	Ca ppm	Mg ppm	Na ppm	DTPA Zn ppm	Fe ppm	Mn ppm	Cu ppm	BORON Sorbitol ppm	EST. CATION EXCHANGE CAPACITY (CEC) me/100g	% SATURATION BASE	H	Ca	Mg	K	Na
895051	26	474				1.3				1.6							
895052	23	316				0.4				1.8							
895053	28	291				0.3				1.7							

LAB NUMBER	SOLUBLE (SAT. EXT.) Ca me/L	Mg me/L	Na me/L	SODIUM ADSORPTION RATIO (SAR)	EXCH. SODIUM PERCENT (ESP)	GYPSUM REQ T/A	PARTICLE SIZE ANALYSIS SAND %	SILT %	CLAY %	SOIL TEXTURE	CHLORIDE ppm	CHLORIDE lbs/A	EXCH. NH4-N ppm	EXCH. NH4-N lbs/A	ALUMINUM ppm	TOTAL N %
895051	3.53	1.92	4.07	2.47	2	0.0					18.4	66				0.119
895052	2.58	1.26	3.29	2.37	2	0.0					26.8	96				0.047
895053	3.80	1.71	4.41	2.66	3	0.0					27.5	99				0.043

SUGGESTED FERTILIZER RECOMMENDATIONS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	CROP TO BE GROWN	YIELD GOAL	N lbs/A	P2O5 lbs/A	K2O lbs/A	S lbs/A	Zn lbs/A	MgO lbs/A	Fe lbs/A	Mn lbs/A	Cu lbs/A	B lbs/A	Cl lbs/A
895051		FIELD 5													

Analysis By: Olsen's Ag. Lab Recommendations By: Olsen's Ag. Lab

Olsen's Agricultural Laboratory, Inc.

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40290
GARY CHAPMAN
ENVIRO AG ENGINEERING INC
3404 AIRWAY BOULEVARD
AMARILLO TX 79118

NAME : STARK DAIRY DATE RECEIVED: 11/24/2009 DATE REPORTED: 12/01/2009

SOIL TEST RESULTS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	Depth Inches	pH 1:1 Soil	pH Buffer Woodruff	LIME REC T/A 60% ECCE Legume	LIME REC T/A 60% ECCE Non Legume	EL	SOLUBLE SALTS mod. SP mmhos/cm	OM LOI %	NITRATE-N (FIA) ppm	NITRATE-N (FIA) lbs/A	PHOSPHORUS P1 ppm	PHOSPHORUS Bicarb ppm	PHOSPHORUS P2 ppm	PHOSPHORUS M2 ppm	PHOSPHORUS M3 ppm
857114	FIELD 6	0 12	0-12	7.6				L	1.38	1.5	33.8	122		22			
857115	FIELD 6	12 24	12-24	8.1				M	1.72	1.3	41.8	150		7			
857116	FIELD 6	24 36	24-36	8.0				M	1.26	1.0	27.8	100		7			

LAB NUMBER	SULFATE-S Ca-P ppm	NH4OAc (Exchangeable) K ppm	Ca ppm	Mg ppm	Na ppm	DTPA Zn ppm	Fe ppm	Mn ppm	Cu ppm	BORON Sorbitol ppm	EST. CATION EXCHANGE CAPACITY (CEC) me/100g	% SATURATION BASE	H	Ca	Mg	K	Na
857114	26	488				0.8				1.4							
857115	25	299				0.2				1.5							
857116	19	294				0.2				1.6							

LAB NUMBER	SOLUBLE (SAT. EXT.) Ca me/L	Mg me/L	Na me/L	SODIUM ADSORPTION RATIO (SAR)	EXCH. SODIUM PERCENT (ESP)	GYPSUM REQ T/A	PARTICLE SIZE ANALYSIS SAND %	SILT %	CLAY %	SOIL TEXTURE	CHLORIDE ppm	CHLORIDE lbs/A	EXCH. NH4-N ppm	EXCH. NH4-N lbs/A	ALUMINUM ppm	TOTAL N %
857114	3.67	2.26	4.53	2.63	3	0					24.3	87				0.083
857115	5.09	2.65	4.98	2.53	2	0					24.5	88				0.054
857116	4.12	2.08	3.87	2.20	2	0					21.4	77				0.039

SUGGESTED FERTILIZER RECOMMENDATIONS

LAB NUMBER	FIELD IDENTIFICATION	SAMPLE IDENTIFICATION	CROP TO BE GROWN	YIELD GOAL	N lbs/A	P2O5 lbs/A	K2O lbs/A	S lbs/A	Zn lbs/A	MgO lbs/A	Fe lbs/A	Mn lbs/A	Cu lbs/A	B lbs/A	Cl lbs/A
857114	FIELD 6	0 12													

Analysis By: Olsen's Ag. Lab Recommendations By: Olsen's Ag. Lab

Servi-Tech Laboratories

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

Lab No: **1672**

LABORATORY ANALYSIS REPORT

Report Date: 06/15/2009 10:08 am

Send To: 6224	ENVIRO-AG ENGINEERING INC 3404 AIRWAY BLVD AMARILLO, TX 79118		Todd Whatley Laboratory Manager
Client Name:	STARK DAIRY	**Invoice No:**	401826
Sample ID:	WASTEWATER RCS #1		
Date Received:	05/21/2009		

	Analysis results		lbs/acre-in	meq/L
Total Dissolved Solids	1520	mg/L		
NUTRIENTS				
Nitrogen				
Total Nitrogen	190	mg/L	43	
Organic Nitrogen	47	mg/L	11	
Ammonia Nitrogen	143	mg/L	32	10.2
Nitrate+Nitrite Nitrogen	<1	mg/L	0	0
Major and Secondary Nutrients				
Phosphorus	42	mg/kg		
Phosphorus as P2O5	100	mg/kg	23	
Potassium	195	mg/kg		5.0
Potassium as K2O	230	mg/kg	52	
Chloride	57	mg/L	13	1.6
OTHER PROPERTIES				
Moisture	99.7	%		
Total Solids	0.3	%	680	
Organic Matter	0.2	%	453	
Ash	0.1	%	227	
C:N Ratio	6.1	ratio		

Servi-Tech Laboratories

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Phone: 806.677.0093
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Fax: 806.677.0329

Lab No.: **1671**

LABORATORY ANALYSIS REPORT

Report Date: 06/05/2009 03:48 pm

Send To: 6224

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

Todd Whatley
Laboratory Manager

Results For: STARK DAIRY
Sample ID: MANURE
Date Received: 05/21/2009

Invoice No: 401826

		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	%	2.73	0.861	17.2	8.3
Organic Nitrogen	%	2.19	0.691	13.8	4.9
Ammonium Nitrogen	%	0.537	0.169	3.4	3.4
Nitrate+Nitrite Nitrogen	%	0.001	0.00	<0.1	<0.1
Major and Secondary Nutrients					
Phosphorus	%	0.594	0.205		
Phosphorus as P2O5	%	1.36	0.470	9.4	8.5
Potassium	%	1.90	0.656		
Potassium as K2O	%	2.28	0.787	15.7	15.7
Micronutrients					
Chloride	mg/kg	7300	2500	5.0	5.0
OTHER PROPERTIES					
Moisture	%		68.5		
Total Solids	%		31.5	630	
Organic Matter	%	78.1	24.6	492	
Ash	%	21.9	6.9	138	
C:N Ratio	ratio	16.6	16.6		

* Assumes 35% 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.

12.2 Daily and Weekly Logs

STARK DAIRY

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:	*Precip:	*Precip:	*Precip:	*Precip:	*Precip:	*Precip:
**Sky Conditions:	**Sky Conditions:	**Sky Conditions:	**Sky Conditions:	**Sky Conditions:	**Sky Conditions:	**Sky Conditions:
Water Lines Inspected:	Water Lines Inspected:	Water Lines Inspected:	Water Lines Inspected:	Water Lines Inspected:	Water Lines Inspected:	Water Lines 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 #
On-Site Manure	On-Site Manure	On-Site Manure	On-Site Manure	On-Site Manure	On-Site Manure	On-Site Manure
Tonage Applied / Field #	Tonage Applied / Field #	Tonage Applied / Field #	Tonage Applied / Field #	Tonage Applied / Field #	Tonage Applied / Field #	Tonage Applied / Field #
Off-Site Manure	Off-Site Manure	Off-Site Manure	Off-Site Manure	Off-Site Manure	Off-Site Manure	Off-Site Manure
(hauler & amount) tons	(hauler & amount) tons	(hauler & amount) tons	(hauler & amount) tons	(hauler & amount) tons	(hauler & amount) tons	(hauler & amount) tons

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 _____

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 (reported in feet) _____

Pond Marker Reading (reported in feet) _____

Pond Marker Reading (reported in feet) _____

PREVENTATIVE MAINTENANCE LOG

Motors of Dewatering Equipment

Check oil levels _____

Electric panel inspected _____

System fully operational _____

Pumps/Agitators/Screens

Operational _____

Screen openings clean and 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: _____

*Should rainfall exceed 1 inch, document the wastewater level in the pond.

**Sky conditions: Clear (C), Mostly Cloudy (MC), Partly Cloudy (PC), or Overcast (O). Record 24 hours before and after land application.

***Inspect all water lines, including drinking water and cooling water lines, located within the drainage area of the ponds. Document in notes section the repairs made.

12.3 Manure Transfer

Date	Amount Removed (tons)	Recipient	Address of Recipient

12.4 Animal Mortality Handling Practices

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