

# APPENDIX A

# Nutrient Management Plan

For

Wulf Cattle Depot

Corson County, SD

Prepared by DeHaan, Grabs & Associates, LLC, Mandan, ND

October 2020

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Section A: Narrative

# 1. Introduction for Wulf Cattle Depot Nutrient Management Plan

This Nutrient Management Plan was developed for Wulf Cattle Depot, which was Corson County Feeders and the relevant parts of the Corson County Feeders CNMP plan have been used in this NMP. The site is located on the east side of McLaughlin, South Dakota, from the intersection of US Highway 12 & State Highway 63, go 1/2 mile north & 1/2 mile east. The feedlot is located on the south side of the road. The facility is an open lot beef feedlot that has a maximum capacity of 12,400 head of livestock. This Nutrient Management Plan was developed as a joint effort between Wulf Cattle Depot, the Natural Resources Conservation Service (Items from old CNMP plan were used), and DeHaan, Grabs & Associates, LLC.

The total available for crop uptake of N (231,426 lbs) and available P<sub>2</sub>O<sub>5</sub> (735,475 lbs) produced annually by the livestock was determined by DeHaan, Grabs & Associates, LLC using SD-CPA-63A. The Holding Ponds have capacity of 22,763,595 gallons (this includes a small portion of the basins) within the freeboard level. The Holding Ponds have capacity at the Maximum Operating Elevation of 11,218,511 gallons. The volume between the Freeboard and the Maximum Operating Elevation is 11,545,084 gallons. This will be applied through center pivot irrigation. The rate will be calculated in accordance to the crop needs using the SD-CPA-63. The NMP includes 7,551.9 acres of agricultural land, most of which is available for manure application. After excluded acres the land available on a nitrogen basis is approximately 7,312.3 acres. The typical crops grown will be rotated in various sequences to complete a sound agronomic rotation. It is important to remember that the rotation will be adjusted based off of market forces, weather, feed requirements, economic influences, etc. When calculating projected land base requirements and RUSLE 2 calculations, Corson County average yields x 110% was used. When calculating annual nutrient application needs, actual yields on a per field basis will used. P<sub>2</sub>O<sub>5</sub> is in excess of removal. At this rate, it will take approximately 8 years to build all listed fields up to 50 ppm P<sub>2</sub>O<sub>5</sub> (Olsen).

The record keeping section is important for the proper application of nutrients from the facility. Records of commercial fertilizer will also be maintained. The facility will maintain the following documentation from each application of manure or wastewater: current soil sample analysis, current manure or wastewater analysis, records showing equipment calibration, a Water Quality Risk Assessment (WQRA) map showing actual area application, and a completed SD-CPA 63 summary showing calculated application rate based on South Dakota State University (SDSU) recommendations.

### Comprehensive Nutrient Management Plan

The Comprehensive Nutrient Management Plan (CNMP) is an important part of the conservation management system (CMS) for your Animal Feeding Operation (AFO). This CNMP documents the planning decisions and operation and maintenance for the animal feeding operation. It includes background information and provides guidance, reference information and Web-based sites where up-to-date information can be obtained. Refer to the Producer Activity document for information about day-to-day management activities and recordkeeping. Both this document and the Producer Activity document shall remain in the possession of the producer/landowner.

Farm contact information: Wulf Cattle Depot, (Lucas Sutherland)

605-823-4467 PO Box 560

Latitude/Longitude: 45.816N & 100.8069W

McLaughlin, SD 57642

Plan Period:

2020-2024

Animal Type:

Beef

Animal Units: 12,400

### Owner/Operator

As the owner/operator of this CNMP, I, as the decision maker, have been involved in the planning process and agree that the items/practices listed in each element of the CNMP are needed. I understand that I am responsible for keeping all the necessary records associated with the implementation of this CNMP. It is my intention to implement/accomplish this CNMP in a timely manner as described in the plan.

Signature: Name: Riverview, LLP, Dba Wulf Cattle Depot	. 1-1-
Signature:	Date: 10/3/2020
Name: Riverview, LLP, Dba Wulf Cattle Depot	

### **Conservation Planner**

As a Conservation Planner, I certify that I have reviewed both the Comprehensive Nutrient Management Plan and Producer Nutrient Management Activities documents for technical adequacy and that the elements of the documents are technically compatible, reasonable and can be implemented.

Signature: Nathon Pesta	Date: 10/3/2020
Name: Nathan A. Pesta, P.E.	
Title: Senior Project Engineer	
Manure and Wastewater Handling and Stora	ge
Signature:	Date: 10/3/2020
Name: Nathan A. Pesta, P.E.	
Title: Senior Project Engineer	

### **Nutrient Management**

The Nutrient Management component of this plan meets the SD Nutrient Management 590 Practice Standard.

Signature: Meta Pesta	Date	10/3/2020
Name: Nathan A. Pesta, P.E. Title: Senior Project Engineer		

Sensitive data as defined in the Privacy Act of 1974 (5 U.S.C. 552a, as amended) is contained in this report, generated from information systems managed by the USDA Natural Resources Conservation Service (NRCS). Handling this data must be in accordance with the permitted routine uses in the NRCS System of Records at http://www.nrcs.usda.gov/about/foia/408\_45.html. Additional information may be found at http://www.ocio.usda.gov/qi\_request/privacy\_statement.html.

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### **Nutrient Management Plan Contact Information**

a. Facility:

NAME: Wulf Cattle Depot ADDRESS: PO Box 659

400 Sale Barn Road McLaughlin, SD 57642

**PHONE NUMBER:** (605) 823-4467

**EMAIL:** lucas@wulflimousin.com

MANAGER: Lucas Sutherland

b. Owners:

**NAME:** Riverview LLP, Dba Wulf Cattle Depot

**ADDRESS:** 26406 470<sup>th</sup> Ave Morris, MN 56267

**PHONE NUMBER:** (320) 392-5319

c. NMP Developed by: DeHaan, Grabs & Associates, LLC

NAME: Nathan A. Pesta
ADDRESS: 4200 21<sup>st</sup> St SE #101
Mandan, ND 58554

**PHONE NUMBER:** (701) 663-1116

**CELL NUMBER:** (701) 400-3950

d. Legal Location of Facility

NE-1/2, Section 5, T-21-N, R-27-E, Corson County, SD

### e. **NUTRIENT MANAGEMENT PLAN INFORMATION**

Type of Livestock: Beef
Number of head: 12,400
Average Weight: 650 lbs

Total Number of

Acres Included in NMP after excluded acres:.......7,312.3 acres

Is this Permitted:.....Permitted by EPA

### References

The nutrient management plan was developed based on compliance criteria described in the following documents:

- South Dakota State General Water Pollution Control Permit for concentrated animal feeding operations dated <u>October 20, 2003</u>
- ☐ USDA, Natural Resources Conservation Service (NRCS) conservation practice standard <u>Nutrient Management ("590")</u> dated <u>December 2007</u>
- **Interpreting a Soil Test Report, AGF-514-12** Determining the Nutrient Balance

### Land Base

The nutrient management plan includes a sufficient land base to meet the Nitrogen (N)-based and/or Phosphorus (P)-based manure application requirements. P-based levels for spreading manure generally requires a significantly greater land base the N-based. When necessary, fields targeted for phosphorus-based manure application are identified in the <a href="Manure Application Planning">Manure Application Planning</a> section of this plan.

### 5. Site Specific Information

### a) Operation Description

Wulf Cattle Depot is a typical open lot feedlot that has been in operation for many years. The facility currently consists of approximately 98.5 acres of open lots for the confined feeding of 12,400 head of cattle weighing greater an average of 650 lbs. There are four separate drainage areas which include a combination of sediment basins, diversions and holding ponds. The feed storage area is also contained in Area 3. The Irrigation center pivot is located to the southeast of the facility. The Holding Ponds are connected by 8" crossover pipes that are un-gated.

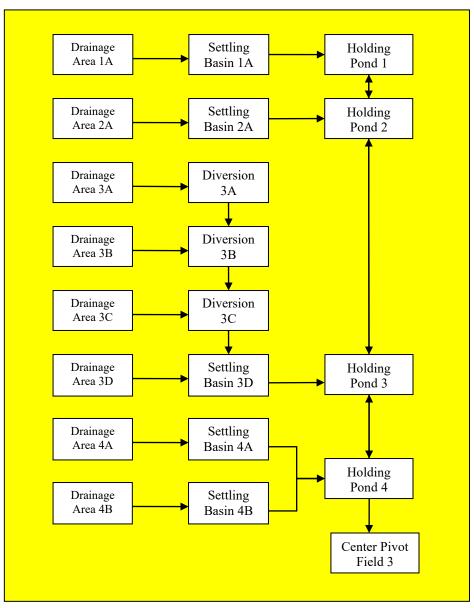
Area 1 utilizes one pen diversion to direct the flow to Settling Basin 1A before discharging into Holding Pond 1. Settling Basin 1 is designed with a perforated riser to slow down the runoff, store the annual amount of solids and pass the 25-year, 24-hour storm into the holding pond. The basin outlet utilizes concrete splash-pads to discharge the runoff into the pond. An 8" crossover pipe connects the effluent from Holding Pond 1 into Holding Pond 2 through gravity.

Area 2 will utilize three pen diversions and two basins (Basin 2A and Basin 2B) to direct the flow before discharging into Holding Pond 2. Settling Basin 2 is designed with a perforated riser to slow down the runoff, store the annual amount of solids and pass the 25-year, 24-hour storm into the holding pond. The basin outlet utilizes concrete splash-pads to discharge the runoff into the pond. An 8" crossover pipe connects the effluent from Holding Pond 2 into Holding Pond 3 through gravity.

Area 3 will utilize four diversions to direct the flow to Settling Basin 3D before discharging into Holding Pond 3. Included in this area is the working facility and half of the feed storage area. Settling Basin 3 is designed with a perforated riser to slow down the runoff, store the annual amount of solids and pass the 25-year, 24-hour storm into the holding pond. The basin outlet utilizes concrete splash-pads to discharge the runoff into the pond. An 8" crossover pipe connects the effluent from Holding Pond 3 into Holding Pond 4 through gravity.

Area 4 will utilize two diversions direct the flow to Settling Basin 4B, before discharging into Holding Pond 4. In addition Settling Basin 4A collects the runoff from pen 100 before discharging into Holding Pond 4. The settling basins are designed with perforated risers to slow down the runoff, store the annual amount of solids and pass the 25-year, 24-hour storm into the holding pond. A floating pump is used to pump the effluent to a center pivot on Field 3.

The following is a drainage flow description for the feedlot:



The facility operates within the *Lake Oahe* watershed. The Hydrologic Unit Code(s) and corresponding Water Quality Impairment(s) for the production area and land application fields include: *Huc8* – *10130102*. *Impairment type is 303D*.

### b) Manure Management Description

The storage period as shown below is 365 days.

### c) Estimated Solid Manure:

Estimates of solid waste was used based off historical data from the feedyard.

12,400 hd beef cattle X 8.4 lbs/hd/day  $\div$  2,000 lbs/ton X 365 days/year = 19,000 tons/year

### d) Estimated Liquid Manure:

Wastewater estimates were determined by developing hydrologic balances using expected annual rainfall, evaporation, and runoff values from The Climatography of the US no 81, 1971-2000, NRCS Figure 10C-8, and AWM Datatabase, McLaughlin Station).

### Total Area

Total Area (153.3 acres) X Annual Runoff (CN 86) (2.7") + Annual Rainfall on Pond (17.4") X Area of Pond @FB (375,222 ft<sup>2</sup>) –Evaporation (33.7") X Average Evaporation Area (219,917 ft<sup>2</sup>) = **10,688,702 gallons** = **1,428,971 ft**<sup>3</sup>

### **Estimated Annual Manure Generation for Land Application (based on records for solids)**

Type	Amount
Solid Manure	<i>19,000</i> Tons
Liquid Manure	10,688,702 Gallons

### e) Manure Management

100% of the waste generated at the facility will be land applied. Wulf Cattle Depot owns, leases or has manure application agreements of land of 7,551.9 acres for manure solids application. Wulf Cattle Depot has a lease or owns land for 223.6 acres for application of liquid from the runoff holding ponds. (Manure Easements in Section H) Please refer to the facility maps to see exact location of these fields and their descriptions. The solid waste will be land applied to include the sludge from the runoff holding ponds.

The liquid will be applied through two center pivot systems on crop land. Liquid will be pumped to these fields using an existing underground pipeline going to Field 3, 12B and 47B. A floating electrical pump is located in Holding Pond 4. All effluent can gravity drain to Holding Pond 4 with crossover pipes.

f) Equipment Available

Equipment Description (55 hp tractor, pto driven pump, honey wagon, center pivot, traveling gun, etc.)	Equipment Purpose  (transport, collection, land application, agitate manure in basin, etc.)	Capacity  (gallons per minute, gallons, bushels, acres, cubic yards, etc.)	Owned (O), Leased (L), or Contracted (C)
Holding Pond 4 Pump	Transport to Pivot on Field 3, 12B & 47B	450 GPM	(L)
Side Dump	Transport to Field	16 Cubic Yards	(O)
Pay Loader	Transport to Side Dump & Spreader	6.5 Cubic Yards	(O)
Manure Spreader	Land Applied to field	16.5 Ton Spreader	(C)

### 6. Land Application Rate Methodology

This facility chooses the "narrative" rate approach for expressing nutrient application rates. Thus, the methodology outlined in this Section will be adhered to each year for determining nutrient application rates, as a term of the permit. Intended crop rotations are listed for each field in Section C. SD-CPA-63; however, any crop may be planted, if necessary.

Limitations on application rates, as determined in accordance with the Nutrient Management Code 590, Table 1 and are shown in Section D, Table D.1. Maximum nutrient application rates are determined based on the following assumptions:

- The amount of N and P in the manure that will be plant available is determined based on manure nutrient sampling results.
- Nitrogen application rates (commercial fertilizer + plant available manure N) will not exceed crop N requirements minus N credits:

Crop N Uptake

- Organic Matter N Mineralization
- Past Year Legume N Credit
- Past Year Manure N Credit
- Soil Residual N

Total N Application (Manure + Commercial Fertilizer)

Nitrogen credits include organic matter mineralization, past year legume credits, past year manure credits, and soil residual N, are based on South Dakota State University) (SDSU) recommendations, using the SDSU EC 750 "Fertilizer Recommendations Guide" that is established in the SD-CPA 63 program. If allowable application rates are P based, P application rates from both commercial fertilizer and plant available manure P will be based on the crop P uptake listed in

Examples of the above calculations are included in SD-CPA-63, Section C. Included in SD-CPA-63 are maximum application rates of manure per field. Also included are projections of manure applications and field nutrient balances for the next five years.

### 7. Nine Minimum Standards

### a) Adequate Storage Verification

Manure, litter, and process wastewater storage structures shall be designed, operated, and maintained as described in Sections A and B of the permit to ensure no discharges to waters of the State.

All of the control structures were designed and built to control the runoff from a 25-year, 24-

SD-CPA 63.

hour storm event (3.9 inches) and annual rainfall and runoff as shown in the Appendix for Calculations. The maximum volume that was calculated was 2,942,090 ft<sup>3</sup> and the volume provided as shown in Section M.2 is 3,043,261 ft<sup>3</sup>

### b) Management of Mortalities

Mortalities shall not be disposed of in any liquid manure, storm water, or process wastewater system and shall be handled in such a way as to prevent the discharge of pollutants to surface or groundwater.

Mortalities will not be disposed of in any liquid manure, store water or process wastewater system and will be handled in such a way as to prevent the discharge of pollutants to surface or groundwater. The method for disposing of routine mortalities is cremation. Prior to disposal to the cremator these animals will be hauled to and kept in a specified area, within the facility footprint, that is easily accessible to the truck used for transport to the cremator and is not open to public view. In the case of the cremator not working, burial is the secondary method. The burial site will have soils that shall provide an adequate clay liner to protect groundwater, ensure biosecurity, and avoid creating nuisance conditions. Burial location is shown in Section R.1.

Catastrophic mortalities due to natural disasters may be handled differently than catastrophic mortalities due to foreign animal disease. In either case, the EPA Region 8 will be contacted for assistance prior to any disposal at 303-312-6312. In case of a catastrophic mortality event, Wulf Cattle Depot will contact EPA to help select a proper burial site. This site will have soils that shall provide an adequate clay liner to protect groundwater, ensure biosecurity, and avoid creating nuisance conditions. The incineration location is shown in Burial location is shown in the Burial location is shown in Section R.2.

### c) Diversion of Clean Water from Production Area

Clean water shall be diverted, as appropriate, from the production area.

Freshwater runoff is diverted from the production by natural topography, diversion berms, channels, and/or waterways. Any runoff that is not diverted is retained by retention structures.

Various inspections will be conducted by the facility operator in order to ensure compliance. Storm water diversion devices, runoff diversion structures, and devices channeling contaminated storm water to the wastewater and manure storage and containment structure will be inspected weekly. Water lines, including drinking and water or cooling lines will be visually inspected daily. These inspections will be documented on the Monthly Operations Reports. Corrective action taken during any inspections will be documented on the Monthly Operations and Annual Report as well. Natural topography and Diversion locations are shown in Section R.1.

### d) Prevention of Direct Contact between Livestock and Surface Waters

Confined animals shall be prevented from having direct contact with waters of the United States.

Wulf Cattle Depot will limit the potential for contact of livestock with surface water by making

sure all livestock are kept fenced in. The facility does not have any surface water flowing through any of the pens where livestock are kept.

### e) Chemical Handling

Chemicals and other contaminants shall not be disposed of in any manure, litter, process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants.

Wulf Cattle Depot will ensure that chemicals (including but not limited to herbicides, insecticides, pharmaceuticals, petroleum products, and cleaners) handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage or treatment system. The facility will also work towards minimizing the use of potentially harmful chemicals/contaminants and ensure these products are used according to their labels and disposed of properly. Chemicals are stored in the shop as shown R.1.

### f) Conservation Practices to Reduce Nutrient Loss

Site-specific conservation practices shall be implemented to control runoff of pollutants to waters of the United States.

Liquid livestock wastes will not be land applied during a precipitation event, or when the ground is frozen, snow covered, or saturated. Manure, litter, and process wastewater will not be applied closer than 100 feet to any down-gradient surface water, open tile line intake structure, sinkhole, agricultural well head or other conduits to surface water unless an approved compliance alternative is in place. Table D.1 identifies site-specific setbacks, buffers, and/or other waste application limitations for each field. Maps included in Section F, identify the locations of all setbacks. Section I includes all conservation practices in detail.

### g) Protocols for Manure and Soil Testing

Manure, litter, process wastewater, and soils shall be tested following protocols as shown in Section O: Manure Application Planning.

Soil samples will be collected and prepared according to the FS 935, "Recommended Soil Sampling Methods for South Dakota". Testing will be conducted by an Agvise Laboratories using analytical procedures. Agvise Laboratories is located at 902 13 Street North, P.O. Box 187, Benson, MN 56215. Soil sampling areas will be taken from uniform areas. A certification of the location and number of representative cores collected from the field will be submitted with each soil test. A representative number of cores will be taken from each area by either of the following methods:

• Soil sample cores will be taken to a depth of 24 inches. The top 6 to 8 inches of each core will be combined to obtain a surface sample. The remaining portions of each core will be combined to obtain a profile sample. The surface sample will be tested for organic matter, pH, phosphorus, potassium, and nitrate-N. The profile sample will be tested for nitrate-N.

• Surface and profile samples will be obtained from separate cores. Surface sample cores will be taken to a depth of 6 to 8 inches and will be tested for organic matter, pH, phosphorus, and potassium. Profile soil sample cores will be taken to a depth of 24 inches and will be tested for nitrate-N.

Each field will have a surface soil test taken within 12 months prior to the first year of a new plan, and thereafter a minimum of every three years, when used for land application of manure, litter, or process wastewater. Annual testing will be conducted during the permit cycle if manure, litter, or process wastewater is applied two or more consecutive years. Profile soil samples will be taken within 12 months prior to any land application of manure, litter, or process wastewater.

Manure, litter, compost, and process wastewater will be analyzed a minimum of once annually for total nitrogen, organic nitrogen, ammonium-nitrogen, phosphorus, and moisture content. Manure samples will be collected, prepared, stored and shipped in accordance with Fact Sheet SD-NRCS-FS-36, "Sampling Manure for Nutrient Management"; this can be found in Section O. Testing will be conducted by either "Minnesota Valley Testing Laboratories, Inc, South Dakota State University testing lab or Dairyland Laboratories, Inc. A form for the SDSU testing lab is located in Section O.

### H) Protocols for Land Application of Manure and Wastewater

Manure, litter, and process wastewater shall be land applied at agronomic rates, in accordance with the South Dakota State University,(SDSU) recommendations, using the SDSU EC 750, on fields specified in the approved Nutrient Management Plan as calculated and shown in the SD-CPA-63 planner. It is to note that SD-CPA-63 planner, mineralization and legume rates were planned by Ron Gelderman, soil testing program manager SDSU Plant science Department

Table D.1 lists fields under control of the facility that may potentially receive livestock waste applications during the course of the five-year NMP period. The spreadable acres listed for each field take into account any setbacks or buffers that would reduce the field acres. The Nitrate Index assesses the potential risk for loss of N from the field.

All waste application equipment will be calibrated annually to ensure that application rates are accurate. All equipment and components of the waste management systems will be checked on a regular basis. Certain items such as holding pond operating levels will be monitored weekly. Other items such as pipelines and application equipment will be monitored during application periods.

### I) Recordkeeping

Records shall be maintained which document the implementation and management of this NMP. Guidelines are shown in Section N of this plan and are documented Section C. SD CPA 63 planner.

DeHaan, Grabs & Associates, LLC

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

FORM 2B NPDES	<b>EPA</b> con	CENTRATE	APPLICATIONS	FOR 1	MENTAL PROTECTION AGEN PERMIT TO DISCHARGE WAS' RATIONS AND AQUATIC ANIM						
I. GENERAL INFORM	IATION	Applying f	or: Individual Permi	t 🗆	Coverage Under Gene	eral Permit					
A. TYPE OF BU	JSINESS		B. CONTACT	ORMATION	C. FACILITY OPERATION STATUS						
<ul> <li>□ 1. Concentrated Anim Operation (comple and section II)</li> <li>□ 2. Concentrated Aqua Production Facility B, C, and section I</li> </ul>	ete items B, C, D, atic Animal y (complete items	Telephon Address: Facsimile	Dwner/or								
Address: City: County: If contract operation:	Stat	e: Latitude:	Facsi	imile: Code:							
II. CONCENTRATED	ANIMAL FEEDIN	NG OPERA	ATION CHARACT	ERIS	STICS						
A. TYPE AND NUMBER	R OF ANIMALS				MANURE, LITTER, AND/O PRODUCTION AND USE	R WASTEWATER					
<ul><li>1. TYPE</li><li> Mature Dairy Cows</li><li> Dairy Heifers</li></ul>		2. ANI N OPEN NEMENT	MALS  NO. HOUSED  UNDER ROOF	2.	If land applied how many act the applicant are available fo	res of land under the control of rapplying the CAFOs 7,312.3acres r litter, or gallons of waste-					
□ Veal Calves					to other persons?t						
☐ Cattle (not dairy or vocalves) ☐ Swine (55 lbs. or ove	r)										
☐ Horses											
☐ Sheep or Lambs											
☐ Turkeys											
☐ Chickens (Broilers)											
☐ Chickens (Layers)											
□ Ducks											
☐ Other: Specify											
3. TOTAL ANIMALS											

C. □ TOPOGRAPHIC MAP									
D. TYPE OF CONTAINMENT, STORAGE AND CAPACITY									
1. Type of Containment	Total Capaci	ty (in gallons)							
□ Lagoon									
☐ Holding Pond									
☐ Evaporation Pond									
Other: Specify									
2. Report the total number of acres contributing of	drainage: _153.3	acres							
3. Type of Storage	Total Number of Days	Total Capacity (gallons/tons)							
☐ Anaerobic Lagoon									
☐ Storage Lagoon									
☐ 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 ap Permitting Authority.	oplication is not comple	te until a nutrient man	nagement plan is submitted to the						
1. Please indicate whether a nutrient managemen	nt plan has been included	with this permit applica	ation.						
2. If no, please explain:									
3. Is a nutrient management plan being impleme	nted for the facility?	l Yes □ No							
4. The date of the last review or revision of the r	utrient management plan	. Date:							
5. If not land applying, describe alternative use(s	s) of manure, litter, and/o	r wastewater:							
F. LAND APPLICATION BEST MANAGEME	NT PRACTICES								
Please check any of the following best man water quality:	agement practices that ar	e being implemented at	the facility to control runoff and protect						
☐ Buffers ☐ Setbacks ☐ Conservation	tillage	wetlands   Infiltratio	on field □ Grass filter □ Terrace						

III. CONCENTRATED AQUATIC ANIMAL PRODUCTION FACILITY CHARACTERISTICS												
	all give the maxir long-term average	num daily flow, ma	aximum 30-day	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. Racev	vays 3. 0	Other					
	a. Maximum. Daily	b. Maximum 30 Day	c. Long Term Average	C. Provide the used by your fa		ving water and the	ing water and the source of water					
			d fed at your facilit te the maximum wo		es, give the total	2. Water Source						
year in pounds		ater Species	e the maximum we	2. Warm Water Species								
a. Spe	ecies	b. Harvestable W	eight (pounds)	a. Species b. Harvestable Weight (pound.								
		(1) Total Yearly	(2) Maximum			(1) Total Yearly (2) Maximum						
	(1) Total Tearly (2) Maximum											
E. Report the total maximum feed		during the calenda	ar month of	1. Month		2. Pounds of Fo	od					
IV. CERTIFICA	ATION											
attachments and	that, based on m ue accurate and c	y inquiry of those is complete. I am awa	examined and am f ndividuals immedid are that there are si	itely responsible	for obtaining the	information, I beli	eve that the					
A. Name and Off	-	or type)		B. Telephone ( <u>320</u> ) <u>392-6764</u>								
C. Signature	en Nady	Ja-		D. Date Signed 10/2/2020								

Form Approved. OMB No. 2040-0086.

FORM		U.S. ENVIRO													
1	<b>\$EPA</b>	GEN			T/A C										
GENERAL					Permits Progractions" befo	ram ore starting.)	F 1 2		13	14 15					
	ITEMS		GENERAL INSTRUC												
I. EPA I.D. I	NUMBER						designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the								
III. FACILITY	NAME	PI FASE	F PI AC	CELA	BEL IN THI	S SPACE	appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper								
		-	- 1 - 2 1			3 01 7.02	fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI (except VI-B which								
ADDRESS  must be completed regardless). O has been provided. Refer to the descriptions and for the legal aut										mplete all items if no label structions for detailed item					
VI. FACILITY	nzation	3 unde	Willon this												
II. POLLUTANT CHARACTERISTICS  INSTRUCTIONS: Complete A through Lto determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must															
INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of <b>bold-faced terms</b> .															
			YES	Mari NO	k "X"			YES	Mark NO	( "X"					
A 1 (1) 6 (1)	SPECIFIC QU		TES	NO	ATTACHED		C QUESTIONS	IES	INO	ATTACHED					
A. Is this facility results in a c	y a publicly owr lischarge to wate	ned treatment works which ers of the U.S.? (FORM 2A)				include a concentrated	y (either existing or proposed) I animal feeding operation or tion facility which results in a								
0 1 11 11 11 11	994 1 1 1 1	d It. In Park	16	17	18	discharge to waters of t	, ,	19	20	21					
waters of the above? (FOI	ne U.S. other tha	tly results in <b>discharges</b> to n those described in A or B	22	23	24		(other than those described in A esult in a discharge to waters of	25	26	27					
		reat, store, or dispose of	22	23	24		ect at this facility industrial or	25	20	27					
hazardous	wastes? (FORM:	3)	28	29	30	containing, within one	elow the lowermost stratum quarter mile of the well bore, drinking water? (FORM 4)								
G. Do you or wi	G. Do you or will you inject at this facility any produced water						t at this facility fluids for special	31	32	33					
or other flu connection v inject fluids	brought to the surface in oil or natural gas production, ed recovery of oil or natural age of liquid hydrocarbons?				processes such as mining	g of sulfur by the Frasch process, rals, in situ combustion of fossil									
, ,	/ a proposed <b>stat</b>	tionary source which is one	34	35	36	J. Is this facility a propos	ed <b>stationary source</b> which is	37	38	39					
		listed in the instructions and 00 tons per year of any air					dustrial categories listed in the vill potentially emit 250 tons per								
pollutant reg	ulated under the	Clean Air Act and may affect area? (FORM 5)	40	41	42	year of any air pollutant r	regulated under the Clean Air Act ocated in an attainment area?	43	44	45					
of be located	a iii aii attaiiiiileiit	alea: (I OINW 3)				(FORM 5)	ocated in an attainment area:								
III. NAME OF	FACILITY														
1 SKIP 15 16 - 29 30	1 1 1 1		ı	1 1				- 69							
IV. FACILITY	CONTACT							69							
С		A. NAME & TITLE (last	f, first,	& title)	) 	1 1 1 1 1 1	B. PHONE (area code & no.)								
15 16						45	46 48 49 51 52-	55							
<del></del>	ILING ADDRESS	8				40	40 40 43 31 32-								
		A. STREET OR P.	O. BC	X											
3															
15 16		B. CITY OR TOWN				C. STATE	D. ZIP CODE								
<u>c</u>							T T T T								
15 16						40 41 42 47	7 51								
VI. FACILITY	LOCATION														
		REET, ROUTE NO. OR OTHE	R SPE	CIFIC	DENTIFIE	R									
5 16			1 1	1 1	1 1 1	45									
		B. COUNTY	/ NAM	E		45									
46	TII		1 1				70								
46		C. CITY OR TOWN				D. STATE	E. ZIP CODE F. COUNTY C	ODE (i	if know	n)					
C 6				ΙT		40 41 40	64 50								

CONTINUED FROM THE FRONT	
VII. SIC CODES (4-digit, in order of priority)	
A. FIRST	B. SECOND  (specify)
7	7
15 16 - 19 C. THIRD	15 16 · 19 D. FOURTH
c (specify)	c
7 15 16 19	15 16 - 19
VIII. OPERATOR INFORMATION	10 10
A. NAME	B. Is the name listed in Item   VIII-A also the owner?
8 Lucas Sutherland	□ YES ☑ NO
15 16	55 06
C. STATUS OF OPERATOR (Enter the appropriate letter into the	
	(COS) 000 4467
P = PRIVATE O = OTHER (specify)	A (605) 823-4467
56 STREET OR DO DOY	15   6 - 18   19 - 21   22 - 20
E. STREET OR P.O. BOX	
PO Box 659, 400 Sale Barn Road	
28	55
F. CITY OR TOWN	G. STATE H. ZIP CODE IX. INDIAN LAND IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
B McLaughlin	SD   57642   Z YES   NO
15 16	40 41 42 47 . 51 52
X. EXISTING ENVIRONMENTAL PERMITS	
	issions from Proposed Sources)
9 N SD-0034606 9 P	
3 N 3 F	30
15   16   17   18	E. OTHER (specify)
	(specify)
9 U 9 9 115 16 17 18 30 15 16 17 18	30
C. RCRA (Hazardous Wastes)	E. OTHER (specify)
	(specify)
9 R 9 9 1 15 16 17 18 30 15 16 17 18	
15   16   17   18   30   15   16   17   18   XI. MAP	30
Attach to this application a topographic map of the area extending to at least one	mile beyond property boundaries. The map must show the outline of the facility, the
	of its hazardous waste treatment, storage, or disposal facilities, and each well where it
injects fluids underground. Include all springs, rivers, and other surface water bodies	in the map area. See instructions for precise requirements.
XII. NATURE OF BUSINESS (provide a brief description)  This is a 12,400 head beef feedlot. The runoff from the	feedlot is contained within four lined helding pends
Nutrients generated from the site both liquid and solids	
Mangagement Plan.	CONTRACTOR
A 1	
WILL DEDTERATION ( )	
XIII. CERTIFICATION (see instructions)	
inquiry of those persons immediately responsible for obtaining the information conta	ne information submitted in this application and all attachments and that, based on my ined in the application, 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 & OFFICIAL TITLE (type or print)  B. SIGNATURE	C. DATE SIGNED
Brady Janzen, Part Owner	143/2000
Intel bability pather Great	Jane 145/2020
COMMENTS FOR OFFICIAL USE ONLY	
<u> </u>	
С	
15 16	55

EPA Form 3510-1 (8-90)

Section B: Initial Nutrient Management Plan

# UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

# INITIAL NUTRIENT MANAGEMENT PLAN

FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

		-

27-Dec-11			N P <sub>2</sub> O <sub>5</sub>	(Ibs.)				 231,426 735,475											231,426 735,475
4. Date:			3-Yr. Mineralization Rate	Manure Handling %				Solid without bedding 61					Variation of the state of the s			THE CONTRACTOR OF THE CONTRACT			Total ibs. of N and P2OS available for the crop:
		7.	Total N retained in field	,				379,387									 		tal lbs. of N an
		(3	N Retained	Application Method %			7000	Broadcast (no incorp.) 80							- I to a to				
3. Prepared By: Nathan Pesta	(S	12.	Time of application					Spring/Fall/Su mmer											173,572,100 lbs/year
repared By:	eration(	11.	Total N available for application	(lbs.)				474,234											OR
Corson 3. ]	Lotal Milogen And Fnosphorus Froduced From Livestock Operation(s)	10,	N retained	Handling/Storage %	70.000			Solid - open lot 52						 		The second of th			475,540
2. County:	roduced Fr	9.	N P <sub>2</sub> O <sub>5</sub> Total Manure as Excreted	(Ibs.)				735,475											Total Manure as Excreted:
Depot	norus F	8.	Days of Confine- Total Ma					365 911,989	   	 		<u> </u>				2000			Total Mar
Wulf Cattle Depot	Id r nost	7.		(lbs.)				059											
A work	Ogen An	9	No. of animals					12,400											
1. Operator:	LUIAITAILI	5.	Animal Type:					Beef								The second secon	Orner williams		

Section C: SD-CPA-63, Nutrient Management Planning Tool

### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Part 1.	Field In	formation													Part 2: Estimat	(ad Nastalia	-4 D												
	Wulf Catt	· · · · · · · · · · · · · · · · · · ·		······································														· · · · · · · · · · · · · · · · · · ·			***************************************								
17. 18	19.	20 20	21		22	Actual or     Yorkis in	x Yiel Co.	unty: Co	rson 26 27			Date:	11/14	112	Opera	tor:		Wulf Cattle Depot	County	y: Cor	orson								
		1	<del>۱۲</del>	1	<del>**</del>	ينهيهمي	THETAGE TICION	3D Ayrkphus	יורייור	7	Current	Soil Test L	evels		1			29											
Field ID (Include maps to		]		ll .				9 m			7		T	•	11						Crops in Re	otation :	and Average Yield:						
at illustrate location) Date added	Beginning		Soil map	Field I	Location:	Predicted soil loss -	Control	/ege	15 2	N Ib/	ac Phosp		ĺ	Soil							Additional 10% is added to	yields fo	or nutrient management purposes.						
를 to Plan	acres in field	County	unit symbol		Township, Range)	RUSLE2	of Land	iae da	ga E	II	(PP		^ ls	ample											V	ar 4		Year 5	
Field	licia	[]	Symbol	il		(T/ac/yr)		d B	=    =		2-4" 0-6"			Date	Previous \			Year 1	10 . 1 2/11		Year 2	Yield	Year 3	v Yield	1	County Yield	-		County
Name or Tract #				ll .		l		ifi "		0.2	2-4 0-6	riest			Crop	County Ac		Сгор	County Yield Yield Goal			Goal		Goal	Crop	Yield Goal	JL	Сгор	Yield
						<del></del>									d I			<b></b>											*******
1 T1631 F1 1 3/10/10	67.1	Corson	DaA	NW 14 Sec 3	. I 21N .R 26E	0,6	Owned	X 31	$\prod X$	67	26	Olsen	492 09	9/19/11	Wheat, Sp. (bu)		55	Oats (bu)	61	Com	om (bu)	75	Sunflowers (lbs)	1,822	Wheat, Sp. (bu)	35	Qats (bu)		65
2 T1631 F2 2 3/10/10	89.0	Corson	RnB	NW 14 Sec 3	.1 21N .R 26E	1.1	Owned	Х	X	67	26	Olsen	492 09	9/19/11	Wheat, Sp (bu)		55	Oats (bu)	61	Com	orn (bu)	75	Sunflowers (lbs)	1.822	Wheat, Sp. (bu)	55	Oats (bu)		65
3 T11198 F8 3 3/10/10	103,0	Corson	ShB	SW 1-4 Sec 4	.T 21N .R 27E	0.1	Owned		X X	38		Oisen :	318 02	2/15/11	Com (bu)		147	Corn (bu)	147	Core	orn (bu)	147	Corn (bu)	147	Corn (bu)	147			63
4 T1637 F2 4 3/10/10	228.0	Corson	RcC	E 1-2 Sec 5	. 1 21 .R 26	0.1	Owned	X 20.0	$\mathbb{Z}$	25	9	Olsen	288 01	1/23/12	Com (bu)		120	Oats (bu)	61	Barl	arley, Malting (bu)	34	Sunflowers (lbs)		Con (bu)	75	Oats (bu)		65
5 T11199 F3 5 3/10/10	61.0	Corson	An	SW 14 Sec 5	T 21N R 27E	0.1	Owned	X 5.5	X	29	9	Olsen :	348 02	2/15/10	Com (bu)		120	Wheat, Sp (bu)	29	Con	orn (bu)	75	Sunflowers (lbs)	1,822	Corn (bu)	75			28 63
6 T11199 F6 6 3/10/10	125 0	Corson	RaB	SE 1.4 Sec 5	1 21N .R 27E	01	Leased	X 5,1	L X	29	9	Olsen :	373 02	2/15/10	Wheat, Sp (bu)		55	Corn (bu)	75			1,822	Corn (bu)	75	Wheat, Sp. (bu)	29			
7 T1764 F1 7 3/10/10	129.4	Corson	ShB	NW 1 4 Sec 6	.1 21N .R 27E			X 6.5	X	17			350 01		Corn (bu)	<del>- i - i</del>	120	Sunflowers (lbs)	1,822			1,822	Wheat, Sp (bu)	29	Corn (bu)	7.5	Sunflower		1492 63
8 T11329 F1 8 3/10/10 9 T11329 F2 9 3/10/10	72.4	Corson	ShB	SE14 Sec 6	1 21N K 27H		Owned	X 12.2		17				7/15/11	Barley (bu)		68	Corn (bu)	75			61	Wheat, Sp (ba)	29	Barley (bu)	29	Com (bu)		63
9 T11329 F2 9 3/10/10 10 T1898 F1 10 3/10/10	295.6 139.8	Corson	ShB ShB	W12 Sec 7	1 21N R 27E		Owned	X 16.2	-X	28	17		$\rightarrow$	9/08/11	Wheat. Sp (bu)		55	Corn (bu)	75		orn (bu)	75	Sunflowers (lbs)	1,822	Wheat, Sp. (bu)	75	- <del> </del>		28
11 T1426 F1 11 3/10/10	139.8	Corson Corson	ShB An	NW 13 Sec 8 NE 14 Sec 8	.T 21N R 27E	0.5	Leased	X	$+ + + \frac{x}{x}$	60	19			2/15/10			120	Wheat. Sp (bu)	29	→	orn (bu)	75	Sunflewers (lbs)	1,822	Corn (bu)	75	Wheat, S	<del></del>	28
12 T1930 F1 12A 6/5/13	80.9		ShB	NE 14 Sec 8	.1 21N .R 27E	0.1		X 2.0	$++\frac{X}{2}$	60				2/15/10	·	<del> </del>	120	Wheat, Sp. (bu)	29		om (ba)	75	Sunflowers (lbs) Sunflowers (lbs)		Com (bu)	75		·	28
13 T1929 F1 13 3/10/10	89.0		ShB	SW 14 Sec 9	.1 21N .R 27E	1.5 0.1	Leased	X 2.0	╢ <del>╵</del>	65	11			9/08/11	Com (bu)		120	Wheat, Sp (bu)	29			75	Sunflowers (lbs)		Corn (bu)	75			28
14 T11460 F1 14 3/10/10	150.0	Corson	RsB	NE 14 Sec 9	.1 218 .R 276	0.2	-	X 2.0 X 18.0	╂╢╬	65 36	11 8	<del></del>	<del></del>	9/08/11 2/12/11	Corn (bu) Sunflowers (lbs)		,822	Wheat, Sp. (bu) Wheat, Sp. (bu)	29		orn (bu)	75	Oats (bu)	61	Sunflowers (lbs)	1,822		····	28
15 T1894 F3 15 3/10/10	133.0	Corson	RaA	SE 14 Sec 9	.1 22 R 27	0.2		X 18.0	+++	36		Olsen 3		2/12/11	Sunflowers (lbs)		.822	Wheat, Sp. (bu)	29		orn (bu)	75	Oats (bu)	61	Sunflowers (lbs)	1,822	Wheat, S	p (bu)	28
16 T1900 F1 16 3/10/10	315.0	Corson	RsB	E 1-2 Sec 10	. I 22N .R 27L	0.2	Leased	X	$+\frac{2}{x}$	68	42			/24/10			120	Corn (bu)	75	→ 1	ficat, Sp. (bu)	29	Sunflowers (lbs)	1,822		75	Com (bu)	)	63
17 T1763 F1 17 3/10/10	155.5	Corson	RaB	SE 1-4 Sec 13	. 1 21N .R 26E	1.0		X 6,5	$\frac{1}{x}$	60		Olsen 3			<u> </u>		120	Wheat, Sp. (bu)	29	<u></u>	om (bu)	75	Sunflowers (lbs)	1,822	Corn (bu)	75	Wheat, S	թ. (ես)	28
18 T1892 F2 18 3/10/10	176.7	Corson	DaA	N 1/2 Sec 15	.T 22N R 27E	10	<b>₹}~~~</b>	X	X	30				2/24/10	Com (bu)		120	Com (bu)	75		heat, Sp. (bu)	29	Sunflowers (lbs)	1,822	Com (bu)	147	Com (bu)	}	63
19 T1892 F3 19 3/10/10	143,0	Corson	SgA	N I-2 Sec. 15	. T 22N .R 27E	1.0	Leased	Х		30	14			2/24/10	Com (bu)		120	Com (bu)	75	Who	heat, Sp (bu)	29	Sunflowers (lbs)	1,822	Corn (bu)	75	Corn (bu)	}	63
20 T1901 F1 20 3/10/10	292.0	Corson	RsB	E12 Sec 16	. T 22N R 27E	0.5	Leased	X 3.5	l x	44	22	Olsen 3	389 02	/24/10	Corn (bu)		120	Cern (bu)	75	Whe	heat, Sp. (bu)	29	Sunflowers (lbs)	1,822	Com (bu)	75			63
21 T10091 F4 21 3/10/10	131.5	Corsen	StA	N 1/2 Sec 19	.'i 22N .R 27E	0, J	Leased	X		28	9	Olsen 2	296 02	2/15/10	Corn (bu)		120	Wheat, Sp (bu)	29	Сога	ога (bu)	75	Sunflowers (lbs)	1.822	Corn (bu)	75		<del></del>	28
22 T1767 F2 22 3/10/10	120.0		SIA	E 1/2 Sec 30	.1 22N .R 27E	0.1	Leased	X 10.7	X	28	19	Olsen 3	347 07	7/21/11	Oats (bu)		80	Barley, Malting (bu)	34	Who	heat, Sp (bii)	29	Corn (bu)	75	Oats (bu)	61		dalting (bu)	
23 T1767 F5 23 3/10/10	105.1		Gr	N 1/2 Sec 31		1.0	{ } <del></del>	X 158		24				7/21/11	Oats (bu)		80	Barley, Malting (bu)	34	Whe	heat. Sp (bu)	29	Com (bu)	75	Oats (bu)	61		dalting (bu)	<b></b>
24 T1767 F6 24 3/10/10 25 T1638 F1A 25 3/10/10	61.0	Corson	ShA	SE 1 4 Sec 31	.1 22N .R 27E	0.1	(i ii	X 3.6		- J				/19/10	Oats (bu)		80	Barley, Malting (bu)	34		heat. Sp (bu)	29	Corn (bu)	75	Oats (bu)	1,827		dalting (bu)	65
25 T1638 F1A 25 3/10/10 26 T1638 F1B 26 3/10/10	156.4 154.0		RsB	\$12 Sec 34	T 22N .R 26E	0.3	<b>∤</b>	X 70	X	28		<del></del>		/19/12	Sunflowers (lbs)		,822	Oats (bu)	61	→ ;	arley, Malting (bu)	34	Coru (bu)	75	Sunflowers (lbs)	1,823			65
27 T1770 F1 27 3/10/10	155.5		DaA ShA	812 Sec 34 NW14 Sec 34	. 1 22N .R 26E	0.1		X 4.0	$\frac{1}{v}$	28				/19/12	Sunflowers (lbs)		.822	Oats (bu)	61		arley, Malting (bu)	34	Corn (bu)	75	Oats (bu)	61		Malting (bu)	
28 T1766 F1 28 3/10/10	99.2	Corson	An	NE 1/4 Sec 34		10		X 7.4 X 0.0	-   <del>  </del>	25 51		Olsen 2		//25/11	Oats (bn)		80	Barley, Malting (bu)	1,822		heat, Sp (bu)	75	Wheat, Sp (bu)	29	Oats (bu)	61			1492
29 29 12/29/11	229.4	Corson	VhB	N12 Sec 4	.T 20N .R 25E	0.3	1	X 0.0	╢╢╬	20	32 12			2/08/11 2/14/11	Oats (bu) Sunflowers (lbs)	+ +	,822	Sunflowers (lbs) Wheat, Sp (bu)	1,822		orn (bu) Theat, Sp. (bu)	29	Wheat, Sp (bu)	29	Sunflowers (lbs)	1,82			28
30 30 12/29/11	155.7		RaC	NW 14 Sec 4	T 21N .R 26E	0.1	<b>}</b> }	X 57	╫╫╬	4 <del> </del>			333 09		Wheat, Sp (bu)	- +	55	Oats (bu)	61		orn (bu)	75	Sunflowers (lbs)	1,822		29	Oats (bu	)	65
31 31 12/29/11	68.4	Corson	RnB	N12 Sec 4	.1 2FN .R 26E	0.0	{ <del> </del>	X 4.3		32		$\rightarrow$	<del></del>	/19/11	Wheat, Sp. (bu)		55	Oats (bu)	61		ora (bu)	75	Sunflowers (lbs)	1,822	Wheat, Sp. (bii)	29	Oats (bu	)	65
32 32 12/29/11	70.4	Corson	RpC	NE 1-4 Sec 4	.T 21N .R 26E	0.4	{ <del>   </del>	X 5.3	$\frac{1}{X}$	<b>₹</b> }	7	<del></del>	333 09		Wheat, Sp (bu)			Oats (bu)	61		om (bu)	75	Sunflowers (lbs)	1.822		29	Oats (bu	)	65
33 33 12/29/11	183.0		RaB	N 1/2 Sec 7	. I 21N . R 26E	0.1	Leased	X 247		85	10		339 09		Wheat, Sp (bu)		55	Wheat, Sp (bu)	29	Sunt	anflowers (lbs)	1,822	Wheat, Sp. (bu)	29	Wheat, Sp. (bu)	29			1492
34 34 12/29/11	38.0	Corson	RcB	NE 1-4 Sec 7	.1 21N .R 26E	0.2	Leased	Х		85	10	Olsen 3	339 09	/19/11	Wheat, Sp (bu)	<del></del>	55	Wheat, Sp. (bu)	29	Sunf	anflowers (lbs)	1.822	Wheat, Sp. (bn)	29	Wheat, Sp. (bu)	29			1492
35 35 12/29/11	317.7		RnB	W 1/2 See 10	.1 21N .R 25E	0.3	Leased	X	X	63	8	Olsen 4	424 09	/19/11	Wheat, Sp (bu)		55	Wheat, Sp (bu)	29	Sunf	inflowers (lbs)	1.822	Wheat, Sp. (bii)	29	Wheat, Sp. (bu)	29	_ <del> </del>		1492 65
36 36 12/29/11	159.1		VeB	SE 1-4 Sec 10	. 1 21N .R 25E	0.2	{}	X 6.1	X	14			<del></del>	/19/12	Sunflowers (lbs)		,822	Oats (bu)	61		arley, Malting (bu)	34	Com (bu)	75		1.82			1492
37   37   12/29/11	157.0	Corson	Gr	\$12 Sec 11	. f 21N .R 25E	0,1	{ <del> </del>	Х	X	56			516 09		Wheat, Sp (bu)		55	Wheat, Sp (bu)	29	$\dashv$ $\vdash$		1.822	Wheat, Sp (bu)	29	Wheat, Sp (bu)	29		·····	28
38   12/29/11     39   39   12/29/11	67.0 254.2	·	RnB	W 1/2 Sec 12	1 21N R 25E	6.1		X	X	12	8		334 10		Wheat, Sp (bu)			Wheat. Sp (bu)	29		arley, Malting (bii)	34	Sunflowers (lbs)	1,822		29 75	~~~	······································	1492
39   12/29/11   40   12/29/11	156.5		RnB CoB	E 1-2 Sec 14 .	.T 21N .R 25E	01	Leased	X 3.1	X	16	13		376 12		Com (bu)		75	Sunflowers (lbs)	1,822		heat, Sp (ba)	29	Sunflowers (lbs)	1,822		75			1492
41 41 12/29/11	85.1	Corson	SgB	NE 14 Sec 23 . SE 14 Sec 24 .	.T 21N R 25E	0.1	}	X	X	16			<del></del>	/14/11	Corn (bu)		75	Sunflowers (lbs)	1,822		heat. Sp (bu)	29 75	Sunflowers (lbs) Sunflowers (lbs)	1,822		29			63
42 42 12/29/11	73.7				}	0.0		X	11	39	17			/08/11	Wheat, Sp. (bu)		_	Corn (bu)	75		orn (bu)		Sunflowers (lbs)	1,822		29			63
43 43 12/29/11	316.3		RnB	SE 14 Sec 24 . W 1/2 Sec 26	T 21N R 25F	0.1	Leased			18					Wheat, Sp. (bu) Sunflowers (lbs)			Corn (bu) Wheat, Sp. (bu)			om (bu) Treat, Sp (bu)		Wheat, Sp. (bu)	29			2 Wheat S		28
44 44 12/29/11	308.7		VeB	\$12 Sec. 32	T 21N R 25E	0.2	Leased	X 0.8		20		Olsen 2						Wheat, Sp. (bu)			heat. Sp. (bu)		Wheat, Sp. (bu)	29			2 Wheat, S		28
45 45 12/29/11	160,0		ReB	NE 14 Sec. 32	.1 22N R 26E	0.5	Owned	X 17.4	╢╬	14		Olsen 2						Alfalfa (ton) > i plant/sq.ft			heat. Sp. (bu)		Corn (bu)		Alfalfa (ton) >1 plant/sq ft			ton) >1 plant/sq.ft	2
46 46 12/29/11	317 1		RaB	W12 Sec 35		0.2	Leased		{ <del> </del>	18					Sunflowers (lbs)			Wheat. Sp (bu)			ficat, Sp. (bu)		Wheat Sp (bu)		Sunflowers (lbs)	1,82	2 Wheat. S	Sp (bu)	28
47 12B 6/5/13	44.7		ShB	NE 13 Sec 9	T 218 R 278	10	Leased		d	65		Olsen 2						Wheat. Sp. (bu)	<del></del>		om (bu)		Sunflowers (lbs)		Corn (bu)	7.5	Wheat, 5		28
48 47A 6/5/13	44.5	Corson	ShA	NW 14 Sec 9 .	. ĭ 21N .R 27E	1.9	Owned			30		Olsen 3						Wheat. Sp (bu)	<del> </del>	⊸ ⊢	orn (bu)	75			Com (bu)	75			28
49         47B         6/5/13           50         48         6/5/13	75.9	Corson		NW 1-4 S∞ 9 .	. I 21N R 27E	1.3	Owned			30		Olsen 3				<del></del>		Wheat, Sp. (bu)			om (bu)	75	Sunflowers (lbs)	1,822	Corn (bu)		Wheat, 9		28
50 48 6/5/13	293.7	Corson	VhB	E 1-2 Sec 16 .	.1 21N .R 27E . .1 21N R 27E . .1 21N .R 27E .	0.4	Owned	X 16.3	X	12		Olsen 3				1.		Wheat, Sp (bu)	29	Oats	ats (bu)	61	Corn (bu)	75	Sunflowers (lbs)	1.82	Wheat.	Sp (bu)	28
Total:	7,551 9																												Tota
Comments:																												Total lbs o	
i															Previous Year = 2012													Total lbs	of N and P dequate a
l															Year 1 = 2013										However, P205 is in exce	ess of removal. At	this rate, it v		
																												······································	

### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Date: 30.  Imitial Nutrient Mgt. Plan - N N based fields (acres)  64 0 89 0 103.0 208.0 55.5 119.9 122.9 122.9 4 139.8 145.7 80.9 87.0	Nutrient Rec	0 0 38 17 70	SDSU 0 Ma	Operator: 32.  danure application based on:  Nitrogen need	Type of Manure (Ye Application)	dds (SD Agrico			Corso Ma N	34. lanure Tes		35. Available N (First	Date:	11/14/12 86.	Operator:			attle Depot 38.		Co	ounty:		39. Nutrients A		To	Date:	11/1	40. Estimate
30.  Initial Nutrient Mgt. Pilan - N based fields (acres)  64.0 89.0 103.0 208.0 55.5 119.9 122.9 60.2 279.4 145.7 80.9	Nutrient Rec Extension  N  42 42 168 84 74 91 104 103	31 ommendation - S of service EC-75  P <sub>2</sub> O <sub>5</sub> I  0 0 0 38 17 70	SDSU 0 Ma	32. lanure application based on:	Manure App  Type of Manure (Ye Application)	dds (SD Agrico	d Incorporation  Type of Application (Time		M	34.		Available		7.1.2.20.3.1	37.		1.00						Nutrients A		To	otal lbs/acre		
Nutrient Mgt. Pilan - N based fields (acres)  64.0 89.0 103.0 208.0 55.5 119.9 122.9 60.2 279.4 145.7 80.9	N 42 42 168 84 74 91 104 103	P <sub>2</sub> O <sub>5</sub> I	0 Ma	based on:	Manure App  Type of Manure (Ye Application)	lication and	Type of Application (Time			lanure Tes			Maximum Manur	- Application Date											To	otal lbs/acre		Estimate
Nutrient Mgt. Pilan - N based fields (acres)  64.0 89.0 103.0 208.0 55.5 119.9 122.9 60.2 279.4 145.7 80.9	N 42 42 168 84 74 91 104 103	P <sub>2</sub> O <sub>5</sub> H	0 1 0 1 0 1 0 1	based on:	Type of Manure (Ye Application)		Type of Application (Time		rganic N	P205 K20			Maximum Manur					Application	11							otal ibs/acie	- 11	
N based fields (acres)  64-0  89-0  103.0  208.0  55.5  119.9  122.9  60.2  279.4  139.8  145.7  80.9	42 168 84 74 91 104 103	0 0 38 17 70	0 1 0 1 0 1	based on:	Application)	ear of		Total N	rganic	P2C K2C	The second second	11/1.1101	The second of th	e Application Rate	Acres of		Walture	Application		Comme	ercial lbs/acre	М	Manure Ibs/a	CIG				years
64 0 89 0 103.0 208.0 55.5 119.9 122.9 60.2 279.4 139.8 145.7 80.9	42 168 84 74 91 104 103	0 0 38 17 70	0 1	Nitrogen need	Application)	ear of		Tot	ğ		Date	crop year)		7 1	Actual Nutrient	The second		Date	Time Period				170			100	2.2	reapplica based
64.0 89.0 103.0 208.0 55.5 119.9 122.9 60.2 279.4 139.8 145.7 80.9	42 168 84 74 91 104 103	0 0 38 17 70	0 1				of incorporation)		0	otal	Tested	lbs/Ton or	To meet N needs	Quantity of	Application	Actual Manu Applie		Manure	When Manure	N	P <sub>2</sub> O <sub>5</sub> K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub> ra
89.0 103.0 208.0 55.5 119.9 122.9 60.2 279.4 139.8 145.7 80.9	42 168 84 74 91 104 103	0 38 17 70	0 1		[ Control of the cont		1		=	F		lbs/1,000 gal		Manure per Field		Аррис		Applied	Applied									
89.0 103.0 208.0 55.5 119.9 122.9 60.2 279.4 139.8 145.7 80.9	42 168 84 74 91 104 103	0 38 17 70	0 1		Description of the last of the																	_						11/4
103.0 208.0 55.5 119.9 122.9 60.2 279.4 139.8 145.7 80.9	168 84 74 91 104 103	38 17 70	0 1	Mitsanan	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	05/25/11	4.1	5 Tons/ac	320 Tons	64.0	5	Tons/ac	October	Fall	20		20	42	65	40	42	65 65	N/A N/A
208.0 55.5 119.9 122.9 60.2 279.4 139.8 145.7 80.9	84 74 91 104 103	17 70	-	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	05/25/11	4.1	5 Tons/ac	445 Tons	89.0	5	Tons/ac	October	Fall	20		20	42	65 580	40 168	42	580	N/A
55.5 119.9 122.9 60.2 279.4 139.8 145.7 80.9	74 91 104 103	70		Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling		1.3		-	1.1	96,700 Gal/ac	9,960,100 Gal	78.0	96,700	Gal/ac	July	Summer	58		110 45	92	143	85	92	143	N/A
119.9 122.9 60.2 279.4 139.8 145.7 80.9	91 104 103			Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	-	1.0			4.1	11 Tons/ac	2,288 Tons	208.0 55.5	9	Tons/ac	October	Fall Fall	37		37	76	117	74	76	117	N/
122.9 60.2 279.4 139.8 145.7 80.9	104 103		-	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0			4.1	9 Tons/ac 11 Tons/ac	500 Tons 1,319 Tons	119.9	11	Tons/ac	October	Fall	45		45	92	143	90	92	143	N/A
60.2 279.4 139.8 145.7 80.9	103			Nitrogen need Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid Solid	Broadcast (None) Broadcast (None)				05/25/11	4.1	13 Tons/ac	1,598 Tons	122.9	13 -	Tons/ac	October	Fall	50		53	109	169	103	109	169	N/
139.8 145.7 80.9				Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			8.4 13.0	1	4.1	13 Tons/ac	783 Tons	60.2	13	Tons/ac	October	Fall	50		53	109	169	103	109	169	N/A
145.7 80.9				Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	-	4.1	11 Tons/ac	3,073 Tons	279.4	11	Tons/ac	October	Fall	46		45	92	143	91	92	143 65	N/
80.9	42	0	0 1	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	05/25/11	4.1	5 Tons/ac	699 Tons	139,8	5	Tons/ac	October	Fall	20		20	42	65 65	40	42	65	N/
	42			Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	_	_	-	4.1	5 Tons/ac	729 Tons	145.7	5	Tons/ac	October	Fall	20		20	42	65	38	42	65	N
87.0	38		-	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		-		05/25/11	4.1	5 Tons/ac	405 Tons	80.9	5	Tons/ac	October	Fall	18		20	42	65	38	42	65	N
132.0	38 66			Nitrogen need Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid	Broadcast (None) Broadcast (None)	-		8.4 13.0 8.4 13.0		4.1	5 Tons/ac 8 Tons/ac	435 Tons 1.056 Tons	132.0	8	Tons/ac	October	Fall	33		33	67	104	66	67	104	N
133.0	66			Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	-	1100	100000000000000000000000000000000000000	4.1	8 Tons/ac	1,064 Tons	133.0	8	Tons/ac	October	Fall	33		33	67	104	66	67	104	N
315.0	52		-	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		_	8.4 13.0	_	4.1	7 Tons/ac	2,205 Tons	315.0	7	Tons/ac	October	Fall	25		28	59	91	53	59	91	N
149.0	42	0		Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	05/25/11	4.1	5 Tons/ac	745 Tons	149.0	5	Tons/ac	October	Fall	20		20	42	65	40	92	65 143	N
176.7	90	6	0 1	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	05/25/11	4.1	11 Tons/ac	1,944 Tons	176.7	11	Tons/ac	October	Fall	45		45	92	143	90	92	143	N
143.0	90		0 1	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		_	8.4 13.0		4.1	11 Tons/ac	1,573 Tons	143.0	11	Tons/ac	October	Fall	45 38		45 37	76	117	75	76	117	1
288.5	76		-	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2			-	4.1	9 Tons/ac	2,597 Tons	288.5	9	Tons/ac	October	Fall Fall	36		37	76	117	73	76	117	1
131.5	74 53	70	-	Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid Solid	Broadcast (None) Broadcast (None)	12.2	_	8.4 13.0 8.4 13.0	-	4.1	9 Tons/ac 7 Tons/ac	1,184 Tons 765 Tons	131.5	7	Tons/ac	October	Fall	25		28	59	91	53	59	91	N
89.3	57			Nitrogen need Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0	_		4.1	7 Tons/ac	625 Tons	89.3	7	Tons/ac	October	Fall	28		28	59	91	56	59	91	٨
57.4	0			Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		-	-		4.1	0 Tons/ac	0 Tons	57.4		Tons/ac	October	Fall	0					0		420	N N
149.4	81	22		Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	05/25/11	4.1	10 Tons/ac	1,494 Tons	149.4	10	Tons/ac	October	Fall	40		_	-	-				N N
150.0	81	22	0 N	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0		4.1	10 Tons/ac	1,500 Tons	150.0	10	Tons/ac	October		_				_				N
148.1	56			Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		-			4.1			_								_	_		76	117	N
99.2	-		-								-	-										41	84	130	82	84	130	١
150.0												_				_			Fall	38		41	84	130	79	84	130	1
64.1											_			641 Tons	64.1	10	Tons/ac	October	Fall	38		41	84	130	79	84	130	1
65.1	77			Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		_		-	4.1	10 Tons/ac	651 Tons	65.1	10	Tons/ac	October	Fall	38		41	84	130	79	-		1
158.3	18	60	0 N	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	05/25/11	4.1	2 Tons/ac	317 Tons	158.3	2	Tons/ac	October	Fall	9	43		_	-		-		1
38.0	18	60	0 N	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		_	_		4.1	2 Tons/ac	76 Tons	38.0	2	Tons/ac			-	_	_	-	-		_		
317.7	40			20.5	Livestock (1st Year)	Solid	Broadcast (None)					4.1	5 Tons/ac	1,589 Tons		5	-	October	Fall			20	42	1 33	95	0		1
153.0			-	Nitrogen need					_								Tons/ac			46	30				46	30		
67.0			-					-	-			-					Tons/ac			90	75				90	75		
251.1	105				Livestock (1st Year)	Solid	Broadcast (None)		_		_	4.1	0 Tons/ac	0 Tons	251.1		Tons/ac			105	13				105	13		
156.5	105			Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)					4.1	0 Tons/ac	0 Tons	156.5		Tons/ac			105	13		-	1				-
85.1	81	0	0 N	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	05/25/11	4.1	0 Tons/ac	0 Tons	85.1		Tons/ac			81	0		1	+		0		1
73.7	81			Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)						0 Tons/ac	0 Tons	73.7		Tons/ac			-			+	+		40		
309.5	84				Livestock (1st Year)	Solid	Broadcast (None)		_	_	_		0 Tons/ac							_			+	+	82	40		
307.9																				96					96	32		
317.1										_					317.1		Tons/ac			84	40				84	40		
44.7	38												16,700 Gal/ac	746,490 Gal	44.7	16,700	Gal/ac	July	Summer	19	0	19	8	100	38	8	100	-
44.5	72				Livestock (1st Year)	Solid	Broadcast (None)						0 Tons/ac	0 Tons	44.5		Tons/ac			72	0					-	100	╢
75.9	72				Livestock (1st Year)	Liquid	Sprinkling		_	_	-	_	31,600 Gal/ac		75.9	31,600	Gal/ac	July	Summer			36	16	190		_	190	+
277.4	90	95	0 N	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4 13.0	05/25/11	4.1	0 Tons/ac	0 Tons	277.4		Tons/ac			90	0			1	90	0		1
7,312.3	N	P2O5	Com	mments:											Comments:													
-		735,475													Manura Analias		013 Growing S	eason										
		144,261													Manue Applica	tion Estimate for 20	orowing .	cason										
1499 1500 1488 99. 1500 64. 65. 1588 31. 1537 67. 1533 309. 307. 142. 317. 44.5. 277.	1.1 1 1 1 1 1 3 3 0 0 0 7 7 7 0 0 0 0 0 0 0 0 0 0 0 0	81 81 81 81 81 81 81 81 81 81 81 82 82 80 81 81 81 82 82 82 82 83 84 84 82 82 82 84 84 82 82 82 84 84 82 82 82 84 84 82 82 84 84 82 82 82 84 84 84 82 82 82 84 84 82 82 84 84 82 82 84 84 82 82 84 84 82 82 84 84 82 82 84 84 82 82 84 84 82 82 84 84 82 82 84 84 82 82 84 84 82 82 84 84 82 82 84 84 84 82 82 84 84 84 82 82 84 84 84 82 82 84 84 84 84 84 84 84 84 84 84 84 84 84	1	1	1	1	1	1	1	1	1	Section   Sect	Section   Sect	81   22   0   Nitrogen need   Livestock (1st Year)   Solid   Broadcast (None)   12.2   1.0   8.4   13.0   0.5/25/11   4.1   10 Tons/ac	Section   Sect	14   81   22   0   Nitrogan need   Livestock (1st Year)   Solid   Broadcast (None)   12.2   1.0   8.4   13.0   05/25/11   4.1   10 Tons/ac   1,494 Tons   1,494 Tons   1.0	14	1	1	1	1	S	1	## 81 22 0 N. Ningen and Livestock (14.1 Year) Solid Broadcast (Nore)   12.2   10   44   130   OSCEPTI   4.5   10 Torside   1.94 Fors   1.	March   Marc	## 27 0 Nitrigen and Uniform Control   19	## 361 22   0   Nilsgoan road   Livestock (14 Year)   Solid   Broadcast (Nors)   123   10   84   130   95/5871   41   10 Torside   15/50 Tors   15/5	Still   Stil

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Plan Year: 2013

Part 5: Nutrient Balance

		41. Nutrien	t Balance			
			F.43			
		Estimated	Estimated			Legume
	Crop Yield,	Crop N	Crop P <sub>2</sub> O <sub>5</sub>	Nitrogen	P <sub>2</sub> O <sub>5</sub>	Credit
	1	Removal	removal	Balance	Balance	(Table 2 of
Field #	lb, bu, ton	lb/ac	lb/ac	lb/ac	ppm	EC750)
1	61	79.3	15.3	28	29	T
2	61	79.3	15.3	28	29	<u> </u>
3	147	176.4	31.9	30	11	
4	61	79.3	15.3	31	15	
5	29	72.5	16.2	31	14	
6	75	90.0	26.3	29	15	
7	1822	91.1	20.0	32	21	
8	75	90.0	26.3	29	20	
9	75	90.0	26.3	32	23	
10	29	72.5	16.2	29	22	
11	29 29	72.5	16.2	29	22	
12A	29	72.5	16.2	30 30	14 14	<b></b>
13	29	72.5 72.5	16.2 16.2	29	13	ļ
14	29	72.5	16.2	29	13	
15	75	90.0	26.3	31	45	<del></del>
16 17	29	72.5	16.2	29	23	<u> </u>
18	75	90.0	26.3	30	20	-
19	75	90.0	26.3	30	21	
20	75	90.0	26.3	30	27	<del> </del>
21	29	72.5	16.2	30	18	<del> </del>
22	34	51.0	13.9	30	20	
23	34	51.0	13.9	30	23	
24	34	51.0	13.9	34	37	
25	61	79.3	15.3	30	7	
26	61	79.3	15.3	30	7	
27	34	51.0	8.5	30	8	
28	1822	91.1	20.0	30	31	
29	29	72.5	16.2	30	13	
30	61	79.3	15.3	30	7	
31	61	79.3	15.3	30	7	
32	61	79.3	15.3	30	7	
33	29	72.5	16.2	31	12	
34	29	72.5	16.2	31	12	
35	29	72.5	16.2	31	11	
36	61 29	79.3 72.5	15.3 16.2	30 30	22 14	1
37	29	72.5 72.5	16.2		11	<u> </u>
38	1822	72.5 91.1	20.0	30 30	13	<u> </u>
39 40	1822	91.1	20.0	30	13	
40 41	75	90.0	26.3	30	16	<del>                                     </del>
42	75	90.0	26.3	30	16	<u> </u>
43	29	72.5	16.2	30	13	<del> </del>
44	29	72.5	16.2	30	13	
45	2	110.0	24.0	14	2	
46	29	72.5	16.2	30	13	
12B	29	72.5	16.2	31	11	
47A	29	72.5	16.2	30	9	
47B	29	72.5	16.2	30	10	
48	29	72.5	16.2	30	5	

### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Part 1: F	ield Info	ormation												Part 2: Estin	nated Nutrient	Requirement		<u></u>								
Operator: \							Cou	inty: C	orson			Date:	12/27/11		erator:	Wulf Cattle Depo	County	y: Corson								
17 18.	19	20	21.	22.		23.	24	25	26. 2	7.		28.				29.										
Field ID (Include maps to illustrate location)  Date added to Plan	Beginning acres in field	County	Soil map unit symbol	Field Location (1/4 Section, Townsh	on: s	Predicted soil loss - RUSLE2	Control of Land	Excluded :	lrngate	N lb/a	Phosp		Soil	O County Average Yie	soil productivity (Productivity elds (SD Agricultural Statisti			Addition	nal 10% is added to ye		and Average Yield: or nutrient management purposes.		Year 4	T	Year :	5
Field	nene		37,11001			(T/ac/yr)		1 Bul	-  -	0-2' 2	2-4" 0-6"	P Test	Date	' [	County Actus	al	Year 1 County Yield	1	Year 2 County Y	Yield	County Y	rield	Coun	nty Yield	Crop	County
Name or Tract #			11					द्		للتال				Crop	Yield Yield		Yteld Goal		Yield G	Geal	Crop Yield (	Goal	Crop Yiel	ld Goal	2.09	Yield
1 T1631 F1 1 3/10/10	67	Corson	DaA	NW14 Sec 3 . 1 2	21N . R 26E	0.6	Owned	V 7 2 .	7	. 20	1 20	Olean 1 400	2 10/04	13 Oats (bu)	61	Com the	75	Corn (bu)		75	Sunflowers (lbs)	,822 Wheat	t. Sp (bu)	55	Oats (bu)	65
2 T1631 F2 2 3/10/10	89.0		RnB		21N R 26E	1.1	Owned	A 5.1	╢;	X 28	29	Olsen 492 Olsen 492			61		75			75			t, Sp. (bu)	55	Onts (bu)	65
3 T11198 F8 3 3/10/10	103.0		ShB		21N R 27E	0.1	Owned	-	x   5	X 30	11				57		147		1	147		.915 Corn (			Wheat, Sp. (bu)	28
4 T1637 F2 4 3/10/10	228.0		RcC		21 . R 26	0.1	Owned	X 20.0		X 31	15	Olsen 286	38 10/01/	13 Oats (bu)	61				·	34		.822   Corn (	··· · · · · · · · · · · · · · · · · ·	75	Oats (bu) Wheat, Sp. (bu)	65 28
5 T11199 F3 5 3/10/10 6 T11199 F6 6 3/10/10	61.0	Corson	An		21N R 27E	01	Owned	X 5.5	4-12	X 31			18 10/01/		29		75			75 1,822		.822   Corn (l	(bu) t, Sp. (bu)	29	Com (bu)	63
7 71764 F1 7 3/10/10	125.0		RaB ShB		21N R 271:	01	Leased Leased	X 51 X 6.5		X 29 X 32	15	Olsen 373	<del></del>		75 1,82		1,822			1,822		29 Corn (		75	Sunflowers (lbs)	1492
8 T11329 F1 8 3/10/10	72.4		ShB		1N R 27E	0.1		X 12.2		X 29		Olsen 357			75		61			61		29 Barley		34	Com (bu)	63
9 T11329 F2 9 3/10/10	295.6		ShB	W1/2 Sec 7 .1 2	11N .R 27E	0.1		X 16.2		X 32		Olsen 289			75		75			75			t. Sp (bu)	29	Corn (bu)	63
10 T1898 F1 10 3/10/10	139.8	Corson	ShB	41	21N .R 27E	0.5	Leased	X		X 29		Olsen 342			29		75			75		.822 Corn (		75 75	Wheat, Sp. (bu) Wheat, Sp. (bu)	28
}	147.7		An			0.1	<u> </u>	X 2.0	444	X 29	22				29			Corn (bu)		75 75		1,822   Com (		75	Wheat, Sp. (bu)	28
12 T1930 F1 12A 3/10/10 13 T1929 F1 13 3/10/10	80.9 89.0		ShB ShB		HN .R 27E	0.1 0.1	Leased Leased	X 2.0		X 30 X	14				29		75	Corn (bu)		75		.822   Com (		75	Wheat, Sp (bu)	28
14 TH460 F1 14 3/10/10	150.0		RsB		22 .R 27	0.2	Owned			X 29			10/01/		29		75						owers (lbs)	1.822	Wheat, Sp. (bu)	28
15 T1894 F3 15 3/10/10	133 0		RaA	-}}	22 .R 27	0.1	Leased	X		X 29		Olsen 381			29		75			75	Otto (Otto)		owers (lbs)	1,822	<u> </u>	28
	315.0		RsB			0.2	Leased	Х		31	<del></del>	Olsen 600	<del></del>		75		29	<del></del>		29		1,822 Com (		75 75	Corn (bu) Wheat, Sp. (bu)	63
	155.5		RaB	4 <del>   </del>	IN .R 26E	1.0	Leased			29		Olsen 376			29		75			75		1,822   Com (		147		63
18 T1892 F2 18 3/10/10 19 T1892 F3 19 3/10/10	176.7		DaA SgA	4 h h	2N .R 27E	1.0		X	444	X 30 X 30		Olsen 294 Olsen 294		<del></del>	75		29			29		1.822 Com (		75	Corn (bu)	63
<u> </u>	292.0		RsB	E 1/2 Sec. 15 . 1 2.		0.5		X 3.5		30		Olsen 294 Olsen 389	~~~		75		29			29		1,822 Corn (		75	Com (bu)	63
21 T10091 F4 21 3/10/10	131.5		StA	N 1/2 Sec 19 . 1 22		0.1	Leased	X		30		Olsen 296			29		75			75	Sunflowers (lbs)	1.822 Corn (	***	75	Wheat, Sp. (bii)	28
22 T1767 F2 22 3/10/10	120.0		StA	E 1/2 Sec 30 . 1 22	2N . R 27E	0.1		X 10.7		X 30	20	Olsen 347	7 10/01/	13 Barley, Malting (bu)	34	Wheat, Sp. (bu)	29			29	Com (on)	75 Oats (		61	Barley, Malting (bu) Barley, Malting (bu)	-
	105.1		Gr			10		X 15.8		X 30		Olsen 332		( <del> </del>	34		29			29		75 Oats (		61	Barley, Malting (bu)  Barley, Malting (bu)	+
	61.0 156.4		ShA RsB	SE 1-4 Sec. 31 . 1 23 S12 Sec 34 . 1 23	2N R 27E 2N R 26E	0.1	Leased Owned	X 3.6	X	34		Olsen 332	~~~		34		29	_		29 34	(0.11)		owers (lbs)	1,822		65
	154.0		DaA	45		0.3		X 70 X 4.0	+++	30		Olsen 395 Olsen 395			61					34	00111 (011)		lowers (lbs)	1.822	Oats (bu)	65
	155.5		ShA	{		0.1		X 74		30		Olsen 274		<del></del>	34	~	29			29	Corn (bu)	75 Oats (		61	Barley, Malting (bu)	1,
	99.2		An	NE 14 Sec 34 .1 23	2N . R 27E	0.1		X 0,0		30	31	Olsen 572	2 10/01/	13 Sunflowers (lbs)	1,82	22 Com (bii)	75	Corn (bu)				29 Oats (		61	Sunflowers (ibs) Wheat, Sp. (bu)	1492
the state of the s	229 4		VhB	l		0.3		X		30	[	Olsen 280	<del></del>		29		29						owers (lbs) at, Sp (ba)	1.822	Oats (bu)	65
}	155.7 68.4		RaC RnB	1	IN . R 26E	0.1		X 5.7 X 4.3		30		Olsen 333			61		75			75			at. Sp (bu)	29		65
	70.4		RpC			0.0		X 4.3 X 5.3	$+ + + \frac{\lambda}{\lambda}$	30		Olsen 333			61		75			75			at. Sp. (bu)	29	Oats (bu)	65
	183 0		RaB	{}{	<b>─</b> !	0.1		X 24 7		31		Olsen 339			29		1,822					29 Whear	at, Sp (bu)	29	Sunflowers (lbs)	1492
the state of the s	38 0	Corson	RcB	NE 1 4 Sec 7 . T 21	IN .R 26E	0.2		X		31		Olsen 339			29	Sunflowers (lbs)	1.822				Wheat, Sp. (bu)		at. Sp (bu)	29	Sunflowers (lbs)	1492
	317.7		RnB	( <del>                                     </del>		03		Х		31	11				29		1.822						at. Sp (bu) lowers (lbs)	1.822	Oats (bn)	65
	159 1		VeB Gr	SE 1.4 Sec 10 .T 21 S 12 Sec 11 .T 21		0.2	Leased Leased				22				61		) 34		····	34 1,822			at. Sp (ba)	29	Sunflowers (lbs)	1492
	67.0	·	Gr RnB	S12   Sec   11   . F   21   W12   Sec   12   I   21	— ii	0.1		X	$\frac{1}{x}$	30		Olsen 516 Olsen 334			29					34			at. Sp. (bu)	29	Wheat, Sp. (bu)	28
	254.2		RnB	E1-2 Sec 14 .T 21		0.1		X 31	$\prod_{x} x$	30	13				1,82		29		····	29	Sunflowers (lbs)	1,822 Com	(bii)	75		1492
40 40 12/29/11	156.5		SgB	NE 1:4 Sec 23 . 1 21	IN .R 251:	0.1		X X		30	13				1,82	22 Wheat, Sp (bu)	29			29		1,822 Com		75	Sunflowers (lbs)	63
	85.1					0.0	Leased	~				Olsen 257			75		75			75			at, Sp (bu)	29		63
	73 7				—	01	Leased			30	16				75		75			75		1,822 Whea 29 Sunfl	at, Sp (bu) lowers (lbs)	1,822		28
	316.3	<del> </del>	RnB VeB	W 1-2 Sec 26 . 1 2F S 1-2 Sec 32 . F 2F	—		Leased Leased	X 6.8 X 0.8		30	······································	<del>-</del>		13   Wheat, Sp (bu) 13   Wheat, Sp (bu)	29	Wheat, Sp. (bu) Wheat, Sp. (bu)		Wheat, Sp. (bu) Wheat, Sp. (bu)			Wheat, Sp. (bu) Wheat, Sp. (bu)		lowers (lbs)	1,822		28
	160.0			·				X 0.8 X 17.4		30				13 Wheat, Sp (bb)  13 Alfalfa (ton) >1 plant/				Wheat. Sp. (bu)			( )		fa (ton) >1 plant/sq ft	2	Alfalfa (ton) >1 plant/sq ft	
46 46 12/29/11	3171			W 1-2 Sec 35 1 21	IN .R 25E			X 174		30				13 Wheat. Sp (bii)	29	<del></del>	29	Wheat, Sp. (bn)			Wheat, Sp (bu)	29 Sunfl	lowers (lbs)	1,822		28
	44 7		ShB	NE 1-4 Sec 9 . 1 21	IN R 27E	19	Leased	Х	X	31	11	Olsen 248	8 10/01/	13 Wheat, Sp (bu)	29	Com (bu)	75	Corn (bu)		75		1.822 Corn		75 75		28
	44.5				IN .R 27E			X		30				13 Wheat, Sp (bu)	29			Com (bil)				1,822 Com		75		28
	75.9 293.7		ShB VbB	NW 1 4 Sec 9 . T 21 E 1 2 Sec 16 . T 21	IN .R 27E	1.3	Owned	X 16.3	X	30		Olsen 334				Corn (bu)		Com (bu)		75 75		1,822 Com 1,822 Whea	······································	29		65
لــــــــــــــــــــــــــــــــــ		Corson	VhB	sec [16] . 1 [21]	*L#IL_	n.4	Owned	A   16.3	JLJLX	1 30		oisen   35	v j 10/01/	13 Wheat, Sp (bu)		Oats (bu)	61	T Con (oa)							rear to the territory of the territory o	Tota
Total: Comments:	7,551.9																									os of N and P2
	rojected value	s only, based off	previous soi	il tests, estimated yields ar	nd nuttients appli	hed																			Total Ib	bs of N and P
•				,										Previous Year = 20	13							Ношен	er P205 is in excess of rer	noval. At th	his rate, it will take approxima	Adequate a nately 8 year(
														Year 1 = 2014								11046	200 10 11 000000 01 10			

### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

ield ID (Include maps to illustrate location)  Field Yield	Date:	- 1	12/27/11		Operator:	Wulf Cattle Depot										Nutrient A												
ield ID (Include maps to illustrate location)  Field Yield					Operator:	wall Callie Depot		County:	C	orson			Dates	12/27/11	Operator:		Wulf C	Cattle Depot		(	County:	Cors	son			Date:	12	2/27/11
illustrate location)  Field Yield	Initial	10.	31.		32.		33.			34.		35.		36.	37			38.					39					40
illustrate location)  Field Yield			Recommenda sion Service			1				Manure	Test	Actual or	s Yield Goal	A The Appropriate St									Nutrients	Applied				100
Field Yield	Nutrient	Literi	ISION Service	EC-750	December 1	Manure Applicat	ation and	Incorporation	7			ON: (Riss)	Maximum Manu dexed by soil productivit	ure Application Rate	Acres of	li .	Manure	Application		Comm	nercial lbs/acre		Manure Ibs	/acre		Total lbs/acr	е	Estim
Field Yield	Mgt. Plan - N based	1			Manure application				Z 2	20	S Date	100000000000000000000000000000000000000	A comment of the comm	ultural Statistics Service)	Actual		_						_	1				reappl
Field Yield	fields				based on:	Type of Manure (Year o	of	Type of Application (Time	ota	ta l	Tested		T	Quantity of	Nutrient	Actual Mar	nure Rate	Date	Time Period	N	DO K	0 N	, BO	K₂O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	base
Name or Tract # Goal	(acres)	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O		Application)		of incorporation)	- 2	6	5	lbs/Ton or lbs/1,000 g		Manure per Field	Application	Appl	lied	Manure Applied	When Manure Applied	I N	P <sub>2</sub> O <sub>5</sub> K <sub>2</sub>	io I iv	P <sub>2</sub> O <sub>5</sub>	120	IN.	1 205	11/20	P <sub>2</sub> O <sub>5</sub>
Joon																		1.0	33,000									
T1631 F1 1 61	64.0	92	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.	0   0 4	13.0 05/25/1	1 4.1	40 Tanadas	700 7	7 (10	1 12	I+	0.1-1	F-11	10 1			9 101	156	92	101	156	I N
T1631 F2 2 61	89.0	92	0	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.	-	13.0 05/25/1	-	12 Tons/ac	768 Tons 1,068 Tons	64.0 89.0	12	Tons/ac	October	Fall Fall	43	0	49	_	156	92	101	156	N
T11198 F8 3 57	103.0	176	32	0	Nitrogen need	The second secon	Liquid	Sprinkling	2.0 1.		7-23-3	_	96,700 Gal/ac	9,960,100 Gal	78.0	96,700	Gal/ac	July	Summer	66	0	11	_	580	176	48	580	N
T1637 F2 4 61	208.0	50	1	0	Nitrogen need	A CONTROL OF A CON	Solid	Broadcast (None)			13.0 05/25/1		6 Tons/ac	1,248 Tons	208.0	6	Tons/ac	October	Fall	26	0	24	_	78	50	50	78	1
T11199 F3 5 29	55.5	89	6	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0	_	13.0 05/25/1		11 Tons/ac	611 Tons	55.5	11	Tons/ac	October	Fall	44	0	45		143	89	92	143	1
T11199 F6 6 75	119.9	92	9	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	0 8.4	13.0 05/25/1	1 4.1	11 Tons/ac	1,319 Tons	119.9	11	Tons/ac	October	Fall	47	0	45	5 92	143	92	92	143	- 1
T1764 F1 7 1,822 T11329 F1 8 75	122.9	89	0	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	0 8.4	13.0 05/25/1	4.1	11 Tons/ac	1,352 Tons	122.9	- 11	Tons/ac	October	Fall	44	0	45	5 92	143	89	92	143	1
T11329 F2 9 75	60.2 279.4	88	0	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0		_		10 Tons/ac	602 Tons	60.2	10	Tons/ac	October	Fall	39	0	41		130	80	84	130	1
T1898 F1 10 29	139.8	91	0	0	Nitrogen need		Solid	Broadcast (None)		_	13.0 05/25/1		11 Tons/ac	3,073 Tons	279.4	- 11	Tons/ac	October	Fall	43	0	45		143	88	92	143	1
T1426 F1 11 29	145.7	91	0	0	Nitrogen need Nitrogen need		Solid Solid	Broadcast (None) Broadcast (None)	12.2 1.0		13.0 05/25/1	4.1	11 Tons/ac	1,538 Tons	139.8	11	Tons/ac	October	Fall	46	0	45		143	91	92	143 143	
T1930 F1 12A 29	80.9	90	6	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0		13.0 05/25/1 13.0 05/25/1		11 Tons/ac	1,603 Tons 890 Tons	145.7 80.9	11	Tons/ac	October	Fall Fall	46	0	45		143	91	92	143	
T1929 F1 13 29	87.0	90	6	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0				11 Tons/ac	957 Tons	87.0	11	Tons/ac	October	Fall	45	0	45		143	90	92	143	
Γ11460 F1 14 29	132.0	91	10	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	-			11 Tons/ac	1,452 Tons	132.0	11	Tons/ac	October	Fall	46	0	45	_	143	91	92	143	
T1894 F3 15 29	133.0	91	10	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	_		4.1	11 Tons/ac	1,463 Tons	133.0	11	Tons/ac	October	Fall	46	0	45	_	143	91	92	143	
T1900 F1 16 75	315.0	72	0	0	Nitrogen need	Livestock (1st Year) S	Solid	Broadcast (None)	12.2 1.0	8.4	13.0 05/25/1	4.1	7 Tons/ac	2,205 Tons	315.0	7	Tons/ac			44	0	28	8 59	91	72	59	91	9.3
T1763 F1 17 29 T1892 F2 18 75	149.0	91	0	0	Nitrogen need	Livestock (1st Year) S	Solid	Broadcast (None)	12.2 1.0	8.4	13.0 05/25/1	4.1	0 Tons/ac	0 Tons	149.0		Tons/ac			91	0				91	0		
	176.7	72	0	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0			4.1	0 Tons/ac	0 Tons	176.7		Tons/ac			72	0				72	0		
F1892 F3 19 75 F1901 F1 20 75	143.0 288.5	72	0	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0			4.1	0 Tons/ac	0 Tons	143.0		Tons/ac			72	0				72	0		_
10091 F4 21 29	131.5	72 90	0	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0			4.1	0 Tons/ac	0 Tons	288.5		Tons/ac			72	0				72	0		-
T1767 F2 22 34	109.3	72	0	0	Nitrogen need Nitrogen need		Solid	Broadcast (None)	12.2 1.0			_	0 Tons/ac	0 Tons	131.5		Tons/ac			90	0			-	90	0		
Γ1767 F5 23 34	89.3	72	0	0	Nitrogen need		Solid Solid	Broadcast (None) Broadcast (None)	12.2 1.0	-		-	0 Tons/ac	0 Tons	109.3	-	Tons/ac			72	0			+	72	0	-	_
Γ1767 F6 24 34	57.4	68	0	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	_		4.1	0 Tons/ac 0 Tons/ac	0 Tons	89.3 57.4		Tons/ac			72 68	0		-	-	68	0		-
1638 F1A 25 61	149.4	51	15	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	_		4.1	0 Tons/ac	0 Tons	149.4	1	Tons/ac			51	15		-	1	51	15		
1638 F1B 26 61	150.0	51	15	0	Nitrogen need	Livestock (1st Year) S	Solid	Broadcast (None)	12.2 1.0	_	2000	4.1	0 Tons/ac	0 Tons	150.0		Tons/ac			51	15				51	15		
F1770 F1 27 34	148.1	72	75	0	Nitrogen need	Livestock (1st Year) S	Solid	Broadcast (None)	12.2 1.0	8.4	_	_	0 Tons/ac	0 Tons	148.1		Tons/ac			72	75				72	75		
Γ1766 F1 28 1,822	99.2	90	0	0	Nitrogen need	Livestock (1st Year) S	Solid	Broadcast (None)	12.2 1.0	8.4	13.0 05/25/1	4.1	0 Tons/ac	0 Tons	99.2		Tons/ac			90	0				90	0		
29 29 30 61	229.4	72	30	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	8.4	3.0 05/25/1	4.1	0 Tons/ac	0 Tons	229.4		Tons/ac			72	30				72	30		
30 61	150.0 64.1	90	29	0	Nitrogen need		Solid	Broadcast (None)	_	8.4		4.1	0 Tons/ac	0 Tons	150.0		Tons/ac			90	29				90	29		
32 61	65.1	90	29	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	_		4.1	0 Tons/ac	0 Tons	64.1		Tons/ac			90	29				90	29		
33 1,822	158.3	90	15	0	Nitrogen need Nitrogen need	The state of the s	Solid	Broadcast (None) Broadcast (None)	12.2 1.0				0 Tons/ac	0 Tons	65.1		Tons/ac			90	29			+	90	29 15		
34 1,822	38.0	90	15	0	Nitrogen need		Solid	Broadcast (None)		8.4		4.1	0 Tons/ac 0 Tons/ac	0 Tons	158.3 38.0		Tons/ac			90	15 15		_	+	90	15		
35 1,822	317.7	90	16	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	-		4.1	0 Tons/ac	0 Tons	317.7	-	Tons/ac			90	16	_	-	-	90	16		
36 61	153.0	51	0	0	Nitrogen need		Solid	Broadcast (None)		_	3.0 05/25/11		6 Tons/ac	918 Tons	153.0	6	Tons/ac	October	Fall	27	0	24	4 50	78	51	50	78	
37 1,822	157.0	91	11	0	Nitrogen need	Livestock (1st Year) So	Solid	Broadcast (None)			3.0 05/25/11		11 Tons/ac	1,727 Tons	157.0	11	Tons/ac	October	Fall	46	0	45		_	91	92	143	
38 29	67.0	51	8	0	Nitrogen need	Livestock (1st Year) So	Solid	Broadcast (None)	12.2 1.0	8.4	3.0 05/25/11	4.1	6 Tons/ac	402 Tons	67.0	6	Tons/ac	October	Fall	27	0	24	4 50	78	51	50	78	
39 1,822 40 1,822	251.1	72	30	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0	_	3.0 05/25/11	4.1	9 Tons/ac	2,260 Tons	251.1	9	Tons/ac	October	Fall	35	0	37		117	72	76	117	
40 1,822	156.5 85.1	72 90	30	0	Nitrogen need		Solid	Broadcast (None)	12.2 1.0			4.1	9 Tons/ac	1,409 Tons	156.5	9	Tons/ac	October	Fall	35	0	37		_	72	76	117	1
42 75	73.7	90	0	0	Nitrogen need		Solid	Broadcast (None)		8.4 1			11 Tons/ac	936 Tons	85.1	11	Tons/ac	October	Fall	45	0	45	_	143	90	92	143	1
43 29	309.5	72	30	0	Nitrogen need Nitrogen need	THE RESERVE THE PROPERTY OF THE PARTY OF THE	Solid				3.0 05/25/11		11 Tons/ac	811 Tons	73.7	11	Tons/ac	October	Fall	45	0	45	_	_	90	92	143	1
44 29	307.9	72	30	0	Nitrogen need		Solid				3.0 05/25/11 3.0 05/25/11		9 Tons/ac 9 Tons/ac	2,786 Tons 2,771 Tons	309.5 307.9	9	Tons/ac	October October	Fall Fall	35 35	0	37	_		72	76 76	117	1
45 2	142.6	64	135	0	Nitrogen need		olid				3.0 05/25/11	_	8 Tons/ac	1,141 Tons	142.6	8	Tons/ac	October	Fall	31	0	33			64	67	104	
46 29	317.1	72	30	0	Nitrogen need		olid				3.0 05/25/11		10 Tons/ac	3,171 Tons	317.1	10	Tons/ac	October	Fall	33	0	4	_	_	74	84	130	
12B 29	44.7	89	16	0	Nitrogen need		quid				5.0 06/06/11		16,700 Gal/ac	746,490 Gal	44.7	16,700	Gal/ac	July	Summer	70		19	_	_	_	8	100	
47A 29	44.5	90	23	0	Nitrogen need	Livestock (1st Year) Sc	olid				3.0 05/25/11		0 Tons/ac	0 Tons	44.5		Tons/ac	October		90			E.117 T.		90			
47B 29	75.9	90	20	0	Nitrogen need		quid				5.0 06/06/11		31,600 Gal/ac	2,398,440 Gal	75.9	31,600	Gal/ac	July	Summer	54		36	6 16	190	90	16	190	
48 61	277.4	79	27	0	Nitrogen need	Livestock (1st Year) Sc	iolid	Broadcast (None)	12.2 1.0	8.4 1	3.0 05/25/11	4.1	0 Tons/ac	0 Tons	277.4		Tons/ac			79	0				79	0		
I Acres:	7,312.3	N	P2O5		Comments:										Comments:													
O5 availab	ed by fields:	352,626	735,475 144,614												S. 100 100 100 100	tion Estimate for 20	14 Growing Sea	ason										
icres are a	available base all listed fields	ed on Nitrog	en analysis																									

Plan Year: 2014

Part 5: Nutrient Balance

		41. Nutrien	t Balance			
		Estimated	Estimated			Legume
	2-17-20-07-27	Crop N	Crop P <sub>2</sub> O <sub>5</sub>	Nitrogen	*P <sub>2</sub> O <sub>5</sub>	Credit
	Crop Yield,	Removal	removal	Balance	Balance	(Table 2 o
Field #	lb, bu, ton	lb/ac	lb/ac	lb/ac	100000000000000000000000000000000000000	EC750)
					ppm	EC/30)
1	75	90.0	26.3	32	33	
2	75	90.0	26.3	32	31	
3	147	176.4	51.5	30	14	
4	34	51.0	13.9	29	16	
5	75	90.0	26.3	29	18	
6	1822	91.1	20.0	31	19	1
7	1822	91.1	20.0	28	25	
8	61	79.3	15.3	31	23	
9	75	90.0	26.3	28	26	
10	75 75	90.0	26.3	30	25	
11	75	90.0	26.3	30	25	
12A	75	90.0	26.3	30	17	
13	75	90.0 90.0	26.3 26.3	30 30	17	
14	75	90.0	26.3	30	16 17	
15	29	72.5	16.2	31		
16	75	90.0	26.3	30	47 22	
17 18	29	72.5	16.2	30	19	
19	29	72.5	16.2	30	20	
20	29	72.5	16.2	30	26	
21	75	90.0	26.3	30	17	
22	29	72.5	16.2	30	19	-
23	29	72.5	16.2	30	22	
24	29	72.5	16.2	30	36	
25	34	51.0	13.9	30	7	
26	34	51.0	13.9	30	7	
27	29	72.5	16.2	30	10	
28	75	90.0	26.3	30	30	
29	29	72.5	16.2	30	13	
30	75	90.0	26.3	30	7	
31	75	90.0	26.3	30	7	
32	75	90.0	26.3	30	7	
33	1822	91.1	20.0	30	12	
34	1822	91.1	20.0	30	12	No.
35	1822	91.1	20.0	30	11	4
36	34	51.0	13.9	30	23	
37	1822	91.1	20.0	30	18	
38	34	51.0	13.9	30	13	
39	29	72.5	16.2	30	16	
40	29	72.5	16.2	30	15	
41	75	90.0	26.3	30	19	
42	75	90.0	26.3	30	20	
43	29	72.5	16.2	30	16	
44	29	72.5	16.2	30	16	
45	29	72.5	16.2	32	5	25
46	29	72.5	16.2	32	15	
12B	75	90.0	26.3	30	10	
47A	75	90.0	26.3	30	8	
47B	75	90.0	26.3	30	10	
48	61	79.3	15.3	30	5	

<sup>\*(</sup>Total Land Application of  $P_2O_5$  in Ib/acre - Total Crop Removal of  $P_2O_5$  in Ib/acre)/20 + Soil  $P_2O_5$  in PPM

### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Part 1:	Field Info	ormation													Part 2: Estimated	Nutrient R	Requirement									
	Wulf Cattle	Depot						unty: C				Date:	12/27/	/11	Operator:		Wulf Cattle Depot	County	: Corson							
d ID (Include maps to illustrate location)  Date added to Plan	Beginning acres in	20.	Soil map	Field I	Location: Township, Range)	Predictor soil loss	ed s - Control	Excluded :	26. 2	N Ib/ac	Phoso	m)	K	Soil Sample	Actual or Yield Goal     Yields indexed by soil producti     County Average Yields (SD Ag		Service)			% is added to y		nd Average Yield: or nutrient management purposes.	П	Year 4	П	Year ?
Field ame or Tract #	field		symbol			(T/ac/y		acres d Buffer	8.	0-2' 2-	4' 0-6"	P Test		Date	Previous Year Crop	County Actual Yield Yield	Crop	Year 1    County   Yield   Yield   Goal		County Yield C	Yield Goal	Crop County Y	ield Coal	rop County Yie Yield Go	ld al	Сгор
T1621 E1 20000	(7)	Carre	In. A	Imula c	T 2001 10 10	(F) A (		X 31		V 20	00	Oleva	402 40	0/04/44	Corn (hu)	75	Sunflowers (lbs)	1822	Corn (bu)		75	Sunflowers (lbs)	822 Wheat, Sp. (bu	5:	5 Oa	ts (bu)
T1631 F1 1 3/10/10 T1631 F2 2 3/10/10	67.1 89.0	Corson	DaA RnB	NW 1/4 Sec. 3 NW 1/4 Sec. 3	.T 21N .R 26	6E 0.6	$\rightarrow$	X 3.1	4	X 32 X 32		_	_	0/01/14	Corn (bu)	75	Sunflowers (lbs)	1,822			75		822 Wheat, Sp. (bu			ts (bu)
11198 F8 3 3/10/10	103.0		ShB	SW 1/4 Sec. 4		7E 0.1		Α	X S	X 30	_		318 10	_		147	Corn (bu)	147			147	Dunition (100)	,915 Corn (bu)	14	_	neat, Sp. (bu)
1637 F2 4 3/10/10	228.0		RcC	E 1/2 Sec. 5	T 21 .R 20	26 0.1		X 20.	$\neg$	X 29		_	_	0/01/14	Barley, Malting (bu)	34	Sunflowers (lbs)	1,822	Barley, Malting (bu)		34	Cumonete (100)	,822   Corn (bu)	7:		ts (bu) neat, Sp. (bu)
1199 F3 5 3/10/10	61.0	Corson	An	SW 1/4 Sec. 5	T 21N .R 27	7E 0.1	-	X 5.5	$\neg$	X 29	_		_	0/01/14	Corn (bu)	75	Sunflowers (lbs)	1,822			75	Sumovers (103)	822 Corn (bu)			m (bu)
1199 F6 6 3/10/10	125.0	Corson	RaB	SE 1/4 Sec. 5	T 21N .R 27	7E 0.1	Leased	X 5.1		X 31	19			0/01/14	Sunflowers (lbs)	1,822	Corn (bu)	75		_	1,822	com (ou)	75 Wheat, Sp. (bu 29 Corn (bu)	7.		nflowers (lbs)
764 F1 7 3/10/10	129.4	Corson	ShB	NW 1/4 Sec. 6	.T 21N .R 27	7E 0.1		X 6.5	-	X 28		_		0/01/14	Sunflowers (lbs)	1,822	Wheat, Sp. (bu)	29			1,822	minest, op/(on)	29 Corn (bu) 29 Barley (bu)	3		m (bu)
329 F1 8 3/10/10	72.4		ShB	SE 1/4 Sec. 6	T 21N .R 27	7E 0.1	$\neg$	X 12.	$\neg$ $\vdash$ $\vdash$	X 31				0/01/14	Oats (bu)	61	Wheat, Sp. (bu)	29		_	75	mileur, op. (ou)	.822 Wheat, Sp (bu		-	rn (bu)
329 F2 9 3/10/10	295.6	Corson	ShB	W 1/2 Sec. 7	T 21N .R 27	7E 0.1	Owned	X 16.	2 2					0/01/14	Com (bu)	75	Sunflowers (lbs)	1,822			75	Sumovers (165)	.822   Corn (bu)	-/	-	heat, Sp. (bu)
898 F1 10 3/10/10	139.8	Corson	ShB	NW 1/4 Sec. 8	T 21N .R 27	7E 0.5	$\neg$	X		X 30	_	_	_	0/01/14	Com (bu)	75 75	Sunflowers (lbs) Sunflowers (lbs)		Corn (bu)		75	Dumionors (100)	,822   Corn (bu)	7	5 Wi	heat, Sp. (bu)
26 F1 11 3/10/10 30 F1 12A 3/10/10	147.7	Corson	An	NE 1/4 Sec. 8	.T 21N .R 27	7E 0.1	Owned	X 2.0		X 30				0/01/14	Com (bu)	75	Sunflowers (lbs)	1,822			75	Dumito treto (100)	,822 Corn (bu)	7	5 W	heat, Sp. (bu)
29 F1 13 3/10/10	80.9 89.0	Corson	ShB ShB	NE 1/4 Sec 9 SW 1/4 Sec 9	.T 21N .R 27	7E 0.1		X 2.0		X 30 X 30	_			0/01/14	Corn (bu)	75	Sunflowers (lbs)		Corn (bu)		75		.822 Corn (bu)		_	heat, Sp. (bu)
60 F1 14 3/10/10	150.0	Corson	RsB	NE 1/4 Sec. 9	T 22 R 2	7E 0.1	Owned	X 18.	$\neg$					0/01/14	Com (bu)	75	Oats (bu)	61			75	Oats (bu)	61 Sunflowers (lb			heat, Sp. (bu)
4 F3 15 3/10/10	133.0		RaA	SE 1/4 Sec. 9	T 22 R 2	7 0.1	Leased	X 16.		-			_	0/01/14	Corn (bu)	75	Oats (bu)	61	Corn (bu)		75	Outs (ou)	61 Sunflowers (lb	2)	_	heat, Sp. (bu)
00 F1 16 3/10/10	315.0		RsB	E 1/2 Sec. 10	T 22N .R 27	7E 0.2		X		X 31				0/01/14	Wheat, Sp. (bu)	29	Sunflowers (lbs)	1,822	Wheat, Sp. (bu)		29	Data Company	,822 Corn (bu)		-	orn (bu)
3 F1 17 3/10/10	155.5		RaB	SE 1/4 Sec. 13	T 21N .R 26		$\rightarrow$	X 6.5	$\dashv$					0/01/14	Com (bu)	75	Sunflowers (lbs)	1,822	Corn (bu)		75	Guillette (100)	,822 Corn (bu)		-	heat, Sp. (bu)
2 F2 18 3/10/10	176.7		DaA	N 1/2 Sec. 15	T 22N .R 27	7E 1.0				X 30		_		0/01/14	Wheat, Sp. (bu)	29	Sunflowers (lbs)	1,822	Wheat, Sp. (bu)	_	29	Sumoner (100)	,822 Corn (bu)		_	orn (bu)
2 F3 19 3/10/10	143.0	Corson	SgA	N 1/2 Sec 15	.T 22N .R 27	7E 1.0	Leased	X	] ]	X 30	20	Olsen	294 10	0/01/14	Wheat, Sp. (bu)	29	Sunflowers (lbs)	1,822			29	Sumonere (ree)	.822   Corn (bu)			orn (bu)
01 F1 20 3/10/10	292.0	Corson	RsB	E 1/2 Sec. 16	T 22N .R 27	7E 0.5	Leased	X 3.5		X 30	26	Olsen	389 10	0/01/14	Wheat, Sp. (bu)	29	Sunflowers (lbs)	1,822			29	Sumoners (165)	,822   Corn (bu) .822   Corn (bu)			heat, Sp. (bu)
91 F4 21 3/10/10	131.5	Corson	StA	N 1/2 Sec. 19			Leased	X	)	X 30		_		0/01/14	Com (bu)	75	Sunflowers (lbs)	1,822			75	Damire e. c (1.1.)	,822   Corn (bu) 75   Oats (bu)			arley, Malting (bu)
67 F2 22 3/10/10	120.0		StA	E 1/2 Sec 30			Leased	X 10.	$\neg$ $\vdash$ $\vdash$	. 00			_	0/01/14	Wheat, Sp. (bu)	29	Com (bu)	75			29	com (ou)	75 Oats (bu)		-	arley, Malting (bu)
67 F5 23 3/10/10	105.1		Gr	N 1/2 Sec. 31	T 22N .R 27	110		X 15.3	$\neg$ $\vdash$ $\vdash$	-	_			0/01/14	Wheat, Sp. (bu)	29	Com (bu)	75			29	cem (en)	75 Oats (bu)		-	arley, Malting (bu)
67 F6 24 3/10/10	61.0	Corson	ShA	SE 1/4 Sec. 31	T 22N .R 27	7E 0.1	Leased	X 3.6	-	X 30				0/01/14	Wheat, Sp. (bu)	29	Com (bu)	75	Barley, Malting (bu)		34	com (ou)	75 Sunflowers (lb	bs) 1,:	822 O:	ats (bu)
38 F1A 25 3/10/10	156.4		RsB	S 1/2 Sec. 34	T 22N R 26	0.5	Owned	X 7.0	$\neg$ $\vdash$ $\vdash$ $\vdash$	X 30				0/01/14	Barley, Malting (bu) Barley, Malting (bu)	34	Com (bu)	75			34	cem (em)	75 Sunflowers (II		822 O	ats (bu)
38 F1B 26 3/10/10 70 F1 27 3/10/10	154.0	Corson	DaA ShA	S 1/2 Sec. 34 NW 1/4 Sec. 34	.T 22N .R 26	-	Owned	X 4.0 X 7.4	$\dashv$	X 30 X 30		_	395 10 274 10	0/01/14	Wheat, Sp. (bu)	29	Corn (bu)	75			29		75 Oats (bu)			arley, Malting (bu)
66 F1 28 3/10/10	99.2	Corson	An	NW 1/4 Sec. 34	.T 22N .R 27		Leased Leased	X 7.4 X 0.0	-	X 30				0/01/14	Corn (bu)	75	Wheat, Sp. (bu)	29			75		29 Oats (bu)			unflowers (lbs)
29 12/29/11	229.4	Corson	VhB	N 1/2 Sec. 4	T 20N .R 25		Leased	X 0.0		X 30		_	_	0/01/14	Wheat, Sp. (bu)	29	Wheat, Sp. (bu)	29			29	Wheat, Sp. (bu)	29 Sunflowers (li	00)	_	heat, Sp. (bu)
30 12/29/11	155.7	_	RaC	NW 1/4 Sec. 4	.T 21N .R 26		Owned	X 5.7	11;	X 30			_	0/01/14	Corn (bu)	75	Sunflowers (lbs)	1,822			75	ouniteners (100)	1,822 Wheat, Sp. (b			ats (bu)
31 12/29/11	68.4		RnB	N 1/2 Sec 4	T 21N .R 26	_	Owned	X 4.3	$\rightarrow$	X 30			333 10	_	Corn (bu)	75	Sunflowers (lbs)	1,822	_		75	Duminomers (100)	1,822 Wheat, Sp. (b			ats (bu)
32 12/29/11	70.4		RpC	NE 1/4 Sec. 4	T 21N .R 26		Owned	X 5.3	$\neg$ $\vdash$ $\vdash$	X 30		_		0/01/14	Com (bu)	75	Sunflowers (lbs)	1,822	Corn (bu)		75	Cumre none (non)	1,822 Wheat, Sp. (b	)		ats (bu)
33 12/29/11	183.0		RaB	N 1/2 Sec. 7	.T 21N .R 26			X 24.	$\neg$ $\vdash$ $\vdash$	X 30				0/01/14	Sunflowers (lbs)	1,822	Wheat, Sp. (bu)	29	Sunflowers (lbs)		1,822	Hiller, Op. (Ou)	29 Wheat, Sp. (b	,,,,		unflowers (lbs)
34 12/29/11	38.0	Corson	RcB	NE 1/4 Sec. 7	.T 21N .R 26	5E 0.2	Leased	X	7	X 30	12	Olsen	339 10	0/01/14	Sunflowers (lbs)	1,822	Wheat, Sp. (bu)	29			1,822		29 Wheat, Sp. (b	,)	_	unflowers (lbs)
35 12/29/11	317.7	Corson	RnB	W 1/2 Sec. 10	T 21N .R 25	5E 0.3	Leased	X	,	X 30	11	Olsen	424 10	0/01/14	Sunflowers (lbs)	1,822	Wheat, Sp. (bu)	29			1,822	micat, op. (ou)	<ul><li>Wheat, Sp. (b</li><li>Sunflowers (l</li></ul>		-	Dats (bu)
36 12/29/11	159.1	Corson	VeB	SE 1/4 Sec. 10	T 21N .R 25		Leased	X 6.1		X 30			576 10		Barley, Malting (bu)	34	Com (bu)	75			34	Corn (bu)	29 Wheat, Sp. (b			unflowers (lbs)
37 12/29/11	157.0		Gr	S 1/2 Sec. 11	T 21N R 25		Leased			X 30			_	0/01/14	Sunflowers (lbs)	1,822	Wheat, Sp. (bu)	29	_		1,822	Wheat, Sp. (bu) Sunflowers (lbs)	1,822 Wheat, Sp. (b			Vheat, Sp. (bu)
38 12/29/11	67.0		RnB	W 1/2 Sec. 12	T 21N .R 25		Leased			. 00				0/01/14	Barley, Malting (bu)	34	Sunflowers (lbs)	1,822	_		29	Dumino mere (100)	1,822   Corn (bu)	, ,		unflowers (lbs)
39 12/29/11	254.2		RnB	E 1/2 Sec 14	.T 21N .R 25		Leased			X 30				0/01/14	Wheat, Sp. (bu)	29	Sunflowers (lbs)	1,822			29	O finite (1.0.5)	1,822 Com (bu)		75 S	unflowers (lbs)
40 12/29/11 41 12/29/11	156.5		SgB	NE 1/4 Sec. 23	.T 21N .R 25	_	Leased			X 30			-	0/01/14	Wheat, Sp. (bu) Corn (bu)	29 75	Sunflowers (lbs) Sunflowers (lbs)	1,822			75	ouniterior (100)	1,822 Wheat, Sp. (b	ou)	29	Com (bu)
41 12/29/11	85.1 73.7		An ShB	SE 1/4 Sec. 24	T 21N R 26	SE 0.0 SE 0.1	Leased Leased			-	20		257 10			75	Sunflowers (lbs)	1,822			75		1,822 Wheat, Sp. (t			Com (bu)
42 12/29/11				W 1/2 Sec. 26											Wheat, Sp. (bu)	-	Wheat, Sp. (bu)		Wheat, Sp. (bu)			Wheat, Sp. (bu)	29 Sunflowers (I	/		Vheat, Sp. (bu)
44 12/29/11				S 1/2 Sec. 26						X 30					Wheat, Sp. (bu)		Wheat, Sp. (bu)		Wheat, Sp. (bu)			Wheat, Sp. (bu)	29 Sunflowers (I			Vheat, Sp. (bu)
45 12/29/11				NE 1/4 Sec. 32											Wheat, Sp. (bu)	29	Corn (bu)		Wheat, Sp. (bu)		29	com (ou)	75 Alfalfa (ton)	- Prince - I		Alfalfa (ton) >1 plant/sq
46 12/29/11	317.1			W 1/2 Sec 35											Wheat, Sp. (bu)	29	Wheat, Sp. (bu)		Wheat, Sp. (bu)			mand of the	29 Sunflowers (			Wheat, Sp. (bu)
12B 6/5/13	44.7		ShB	NE 1/4 Sec 9	T 21N .R 27	7E 1.9	Leased	X		X 30	10					75	Sunflowers (lbs)	1,822	Corn (bu)		75	Damire (res)	1,822   Corn (bu)			Wheat, Sp. (bu)
47A 6/5/13	44.5			NW 1/4 Sec. 9						X 30					Com (bu)	75	Sunflowers (lbs)		Corn (bu)		75		1,822 Corn (bu)			Wheat, Sp. (bu) Wheat, Sp. (bu)
47B 6/5/13	75.9		ShB	NW 1/4 Sec. 9	T 21N .R 27	7E 1.3	Owned	X	X X	X 30					Corn (bu)	75	Sunflowers (lbs)		Corn (bu)		75		1,822 Corn (bu)			Corn (bu)
48 6/5/13	293.7	Corson	VhR	E 1/2 Sec. 16	T 21N P 27	0.4	Owned	Y 16	3	y 30	5	Olcon	358 10	0/01/14	Oats (bu)	61	Corn (bu)	75	Sunflowers (lbs)		1.822	Wheat, Sp. (bu)	29 Oats (bu)		01	om (ou)

Total: 7,551.9

Comments:

Soil Tests are projected values only, based off previous soil tests, estimated yields and nutrients applied.

Previous Year = 2014 Year 1 = 2015

Total lbs of N and P2
Total lbs of N and P2
Total lbs of N and P2
Adequate a
However, P2O5 is in excess of removal. At this rate, it will take approximately 7 year(

### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

						Part 3: Plan	ned Nutrient Appl	ication									Part 4: N	Autrient Ap	plication	1							_	_	D	(2)27(1)
			Date:	12/2	7/11	Operator:	Wulf Cattle Depot		County:		Corson	1			Date:	12/27/11	Operator:		Wulf Ca	ttle Depot		(	county:		Corson	39			Date:	12/27/11
	17.		30.	12/	31.	32.		33.				34.		35.		66.	37.		3	38.		_		_	Nı	trients App	lied			
			Initial		ommendation - St		1.0	50.50.0	was a side of		Man	nure Test		A Ashabas	rield Goal Maximum Manur	Application Rate			Manure A	Application		0	assial the	looro		nure Ibs/ac		To	tal lbs/acre	Esti
Field ID (I	Include map	s to	Nutrient	Extension	n Service EC-750		74.02.09.0	lication an	d Incorporation		Z S	3 0		ON: (Basto	ked by soil productivity	(Productivity Index)	Acres of					Comm	nercial lbs	racie	IVIGI	Ture iborde		-		reap
illustra	ite location)		Mgt. Plan -			Manure applicatio based on:	1			Z	anic	2 3	Date	GL68"XB3K	erage Yields (SD Agricu		Actual Nutrient		- D-1-	Date	Time Period		-		20		к о		P <sub>2</sub> O <sub>5</sub>	bas Po
			N based fields			based on:	Type of Manure (Y	ear of	Type of Application (Time	Tot	org	otal	Tested	lbs/Ton or	To meet N needs	Quantity of Manure per Field	Application	Actual Manu Applie		Manure	When Manure	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	IN	7205	P <sub>2</sub> (
Name or	Tract	ield Yield	(acres)	N	P <sub>2</sub> O <sub>5</sub> K	20	Application)		of incorporation)		= +	F		lbs/1,000 ga		Mariare per ricia				Applied	Applied									
Traine of	Tract	" Goal																				1		^ T	0	0	0	89	0	0
T1631	FI	1 61	64.0	89	0	0 Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.	.4 13.0	05/25/11	4.1	0 Tons/ac	0 Tons	64.0		Tons/ac			89 89	-	0	0	0	0	89		0
T1631		2 61	89.0	89	0	O Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.	4 13.0	05/25/11	4.1	0 Tons/ac	0 Tons	89.0	0	Tons/ac	feebe.	Cummor	77			99	43	521	176	43	521
T11198	8 F8	3 57	103.0	176	12	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling			.5 6.0			87,000 Gal/ac	8,961,000 Gal	78.0	86,780	Gal/ac Tons/ac	July	Summer	92	7		0	0	0	92	7	0
T1637		4 61	208.0	92	7	1	Livestock (1st Year)	Solid	Broadcast (None)				05/25/11		0 Tons/ac	0 Tons 0 Tons	208.0 55.5		Tons/ac			92	4		0	0	0	92		0
T11199		5 29	55.5	92	4		Livestock (1st Year)	Solid	Broadcast (None)	12.2	_	4 13.0	05/25/11		0 Tons/ac 0 Tons/ac	0 Tons	119.9	0	Tons/ac			89			0	0	0	89		0
T11199		6 75	119.9	89		Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid Solid	Broadcast (None) Broadcast (None)		_	4 13.0	-		0 Tons/ac	0 Tons	122.9	0	Tons/ac			74			0	0	0	74	-	0
T1764		7 1,822 8 75	60.2	74 72	0		Livestock (1st Year)	Solid	Broadcast (None)	_		4 13.0			0 Tons/ac	0 Tons	60.2	0	Tons/ac		1	72			0	0	0	72	-	0
T11329		9 75	279.4	93	-	0 Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)				05/25/11		0 Tons/ac	0 Tons	279.4	0	Tons/ac			93			0	0	0	93		0
T1898		10 29	139.8	91	0		Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.	4 13.0	05/25/11	4.1	0 Tons/ac	0 Tons	139.8	0	Tons/ac			91			0	0	0	91		0
T1426	FI	11 29	145.7	91	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		_	.4 13.0		_	0 Tons/ac	0 Tons	145.7	0	Tons/ac			91	5		0	0	0	91	5	0
T1930		2A 29	80.9	91	5		Livestock (1st Year)	Solid	Broadcast (None)			.4 13.0	05/25/11	_	0 Tons/ac	0 Tons	80.9 87.0	0	Tons/ac			91	5		0	0	0	91	5	0
T1929		13 29	87.0	91	5		Livestock (1st Year)	Solid	Broadcast (None)	10.0		4 13.0			0 Tons/ac 0 Tons/ac	0 Tons 0 Tons	132.0	0	Tons/ac			79			0	0	0	79	0	0
T11460		14 29	132.0	79	0	1	Livestock (1st Year)	Solid Solid	Broadcast (None) Broadcast (None)			13.0	05/25/11	4.1	0 Tons/ac	0 Tons	133.0	0	Tons/ac			79		-	0	0	0	79	0	0
T1894		15 29 16 75	133.0 315.0	79 90	-	0 Nitrogen need 0 Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid	Broadcast (None)		-	4 13.0	05/25/11	_	0 Tons/ac	0 Tons	315.0	0	Tons/ac			90			0	0	0	90	92	143
T1763		17 29	149.0	91	0		Livestock (1st Year)	Solid	Broadcast (None)			.4 13.0		_	11 Tons/ac	1,639 Tons	149.0	11	Tons/ac	October	Fall	45			45 45	92 92	143 143	90		143
T1892		18 75	176.7	91		0 Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8	13.0	05/25/11	4.1	11 Tons/ac	1,944 Tons	176.7	11	Tons/ac	October	Fall	45	_		45	92	143	90		143
T1892		19 75	143.0	91	0		Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8	3.4 13.0	05/25/11	4.1	11 Tons/ac	1,573 Tons	143.0	11	Tons/ac	October	Fall Fall	45		-	45	92	143	90		143
T1901	FI	20 75	288.5	91	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8	_	05/25/11	-	11 Tons/ac	3,174 Tons	288.5	11	Tons/ac	October	Fall	45			45	92	143	90	92	143
T10091		21 29	131.5	91		Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8			_	11 Tons/ac	1,447 Tons 1,202 Tons	131.5	11	Tons/ac	October	Fall	45			45	92	143	90	92	143
T1767		22 34	109.3	90	0		Livestock (1st Year)	Solid	Broadcast (None)		_	3.4 13.0	05/25/11	_	11 Tons/ac 11 Tons/ac	982 Tons	89.3	11	Tons/ac	October	Fall	45			45	92	143	90	92	143
T1767		23 34	89.3	90		Nitrogen need	Livestock (1st Year)	Solid Solid	Broadcast (None) Broadcast (None)			_	05/25/11	_	11 Tons/ac	631 Tons	57.4	11	Tons/ac	October	Fall	45		1	45	92	143	90	92	143
T1767		24 34 25 61	57.4 149.4	90	29	0 Nitrogen need 0 Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid	Broadcast (None)		1.0 8			-	11 Tons/ac	1,643 Tons	149.4	- 11	Tons/ac	October	Fall	45			45	92	143	90	92 92	143
T1638		26 61	150.0	90	29		Livestock (1st Year)	Solid	Broadcast (None)		1.0 8			_	11 Tons/ac	1,650 Tons	150.0	11	Tons/ac	October	Fall	45	-		45 45	92	143	90	92	143
T1770		27 34	148.1	90		0 Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8	3.4 13.0	05/25/11	4.1	11 Tons/ac	1,629 Tons	148.1	11	Tons/ac	October	Fall	45 36	-		37	76	117	73	76	117
T1766	F1	28 1.822	99.2	72	0	0 Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8	3.4 13.0			9 Tons/ac	893 Tons	99.2	9	Tons/ac	October	Fall Fall	36			37	76	117	73	76	117
		29 29	229.4	72		Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		/ -	3.4 13.0			9 Tons/ac	2,065 Tons 1,650 Tons	229.4 150.0	9	Tons/ac	October	Fall	45			45	92	143	90	92	143
		30 61	150.0	91		Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			3.4 13.0		_	11 Tons/ac	705 Tons	64.1	11	Tons/ac	October	Fall	45	-		45	92	143	90	92	143
		31 61	64.1	91	24		Livestock (1st Year)	Solid Solid	Broadcast (None) Broadcast (None)			3.4 13.0 3.4 13.0		-	11 Tons/ac	716 Tons	65.1	11	Tons/ac	October	Fall	45			45	92	143	90	92	143
		32 61 33 1,822	65.1 158.3	91 72	40	0 Nitrogen need 0 Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid	Broadcast (None)			3.4 13.0			9 Tons/ac	1,425 Tons	158.3	9	Tons/ac	October	Fall	36			37	76	117	73 73	76 76	117
		34 1,822	38.0	72		0 Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			3.4 13.0	_	4.1	9 Tons/ac	342 Tons	38.0	9	Tons/ac	October	Fall	36			37	76 76	117	73	76	117
		35 1,822	317.7	72	50		Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8	3.4 13.0	05/25/11	4.1	9 Tons/ac	2,859 Tons	317.7	9	Tons/ac	October	Fall	36 45	+		45	92	143	90	92	143
		36 61	153.0	90	0	0 Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			3.4 13.0	_	_	11 Tons/ac	1,683 Tons	153.0	11	Tons/ac	October	Fall	36	-		37	76	117	73	76	117
	$\overline{}$	37 1,822	157.0	72		O Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			8.4 13.0		_	9 Tons/ac	1,413 Tons	157.0 67.0	9	Tons/ac	October	Fall	45			45	92	143	90	92	143
		38 29	67.0	91		Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	_		8.4 13.0	-	4.1	11 Tons/ac 11 Tons/ac	737 Tons 2,762 Tons	251.1	11	Tons/ac	October	Fall	45			45	92	143	90	92	143
	-	39 1,822	251.1	91		Nitrogen need	Livestock (1st Year)	Solid Solid	Broadcast (None) Broadcast (None)			8.4 13.0 8.4 13.0	-		8 Tons/ac	1,252 Tons	156.5	8	Tons/ac	October	Fall	58			33	67	104	91	67	104
-		40 1,822 41 75	156.5 85.1	91	9		Livestock (1st Year)	Solid	Broadcast (None)			8.4 13.0			0 Tons/ac	0 Tons	85.1		Tons/ac			91			-			91	-	
		42 75	73.7	91	-	0 Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)				05/25/11		0 Tons/ac	0 Tons	73.7		Tons/ac			91	-			-		72		
		43 29	309.5	72		0 Nitrogen need	Livestock (1st Year)	Solid					05/25/11		0 Tons/ac	0 Tons	309.5		Tons/ac			72	-	-	-	-		72		
		44 29	307.9	72		0 Nitrogen need	Livestock (1st Year)	Solid					05/25/11		0 Tons/ac	0 Tons	307.9	17	Tons/ac	October	Fall	72 19	1	1	69	143	221	88	143	221
		45 2	142.6	88		O Nitrogen need	Livestock (1st Year)	Solid				_	05/25/11	_	17 Tons/ac	2,424 Tons	142.6 317.1	17	Tons/ac	October	ı, alı	72	_		-	1		72		
		46 29	317.1	70		Nitrogen need	Livestock (1st Year)	Solid					05/25/11		0 Tons/ac 32,500 Gal/ac	0 Tons 1,452,750 Gal	44.7	32,500	Gal/ac	July	Summer	54	-		37	16	195	91	16	195
		2B 29	44.7	91		Nitrogen need	Livestock (1st Year)	Liquid					06/06/11		0 Tons/ac	0 Tons	44.5	72,000	Tons/ac			91	1					91	40	105
		7A 29 7B 29	75.9	91		0 Nitrogen need 0 Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid Liquid				_	06/06/11	_		2,466,750 Gal	75.9	32,500	Gal/ac	July	Summer	54	-		37	16	195	91	16	195
		48 75	277.4	90		0 Nitrogen need	Livestock (1st Year)	Solid				_	05/25/1	_		0 Tons	277.4		Tons/ac		1	90			_			90		
																	Comments	:					1							
		O5 availa	7,312.3 ble for crops:	N 231,426	P <sub>2</sub> O <sub>5</sub> 735,475	Comments:												cation Estimate for 20	15 Growing Sc	eason										
		205 requi	ired by fields:	358,338	143,872																									
			available bas d all listed field	ed on Nitrog	en analysis																									

Plan Year: 2015

Part 5: Nutrient Balance

		41. Nutrien	t Balance			
		Estimated	Estimated			Legume
	I Landau and a final	Crop N	Crop P <sub>2</sub> O <sub>5</sub>	Nitrogen	*P <sub>2</sub> O <sub>5</sub>	Credit
	Crop Yield,	Removal	removal	Balance	Balance	(Table 2 of
Field #	lb, bu, ton	lb/ac	lb/ac	lb/ac	ppm	EC750)
1346.0						107507
11	1822	91.1	20.0	28	32	
2	1822	91.1	20.0	28	28	
3	147	176.4	51.5	30	16	
4	1822	91.1	20.0	31	15	
5	1822	91.1	20.0	31	17	
6	75	90.0	26.3	29	18	
7	29	72.5	16.2	32	24	
8	29	72.5	16.2 20.0	30 32	22 25	
9	1822	91.1	20.0	30	24	
10	1822 1822	91.1 91.1	20.0	30	24	_
11	1822	91.1	20.0	30	16	
12A	1822	91.1	20.0	30	16	-
13	61	79.3	15.3	30	15	-
14	61	79.3	15.3	30	16	
15	1822	91.1	20.0	30	46	
16 17	1822	91.1	20.0	29	26	-
18	1822	91.1	20.0	29	23	
19	1822	91.1	20.0	29	24	
20	1822	91.1	20.0	29	30	
21	1822	91.1	20.0	29	20	1
22	75	90.0	26.3	30	22	
23	75	90.0	26.3	30	25	
24	75	90.0	26.3	30	39	
25	75	90.0	26.3	30	10	
26	75	90.0	26.3	30	10	
27	75	90.0	26.3	30	14	
28	29	72.5	16.2	31	33	
29	29	72.5	16.2	31	16	
30	1822	91.1	20.0	29	11	
31	1822	91.1	20.0	29	11	
32	1822	91.1	20.0	29	11	
33	29	72.5	16.2	31	15	
34	29	72.5	16.2	31	15	
35	29	72.5	16.2	31	13	
36	75	90.0	26.3	30	27	
37	29	72.5	16.2	31	21	
38	1822	91.1	20.0	29	17	
39	1822	91.1	20.0	29	20	
40	1822	91.1	20.0	30	17	
41	1822	91.1	20.0	30	19	
42	1822	91.1	0.0	30	19	
43	29	72.5	16.2	30	15	
44	29	72.5	16.2	30	15	
45	75	90.0	26.3	32	11	
46	29	72.5	16.2	32	16	
12B	1822	91.1	20.0	30	10	-
47A	1822	91.1	20.0	30	7	
47B 48	1822 75	91.1 90.0	20.0 26.3	30 30	9	

<sup>\*(</sup>Total Land Application of  $P_2O_5$  in Ib/acre - Total Crop Removal of  $P_2O_5$  in Ib/acre)/20 + Soil  $P_2O_5$  in PPM

### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

raft 1:	Field In	formation															rait 4; ESU	mated Nutrien	LKC	quicili												
Operator	: Wulf Catt	le Depot								ıty: Co				Date:	11	1/14/12	0	perator:	W	/ulf Caule Depot		County:	Corson									
17. 18 ield ID (Include maps to illustrate location) Date adder	19 Beginning	20.	21 Soil map	F	22	BOM:	Predu soil lo	heted	24 Control	Exclud	26. 27	N Ib/a	Pho	28 nt Soil Tes sphorus (ppm)	st Levels	Soit	11	oal y soil productivity (Productiv Yields (SD Agricultural Stati							and Average Yield: for nutrient management pur	rposes.						_
to Plan	acres in field	County	unit symbol			ship, Range)	RUSI		f Land	ed acre	jated -Till			P Test	(bbu)	Sample Date	Prev	ious Year County Ac		Year	County	Yield	Year 2		Year Crop	County Yi	eld	Crop Cour			Crop	Co
Name or Tract #				L				L				0-2   2	-4 0-6	Fiest		<u> </u>	Стор	Yield Yi		Crop	Yield		Crop Yiel	ld Goal	Ciop	Yield G	oal [	Tit			1 1	<del></del>
T1631 F1   1   3/10/10	67 1	Corson	DaA	NW 14 Sec	3 .r	21N . R 26H	E 0.0	0.6	Dwned	X 31	$\prod X$	28	32	Olsen	492	10/01/1	5 Sunflowers (lbs)	1.3	822	Wheat, Sp. (bu)			Corn (bu)	75	Sunflowers (lbs)			Wheat, Sp. (bu) Wheat, Sp. (bu)	55			-
T1631 F2 2 3/10/10	89,0	Corson	RnB	NW 14 Sec.	3 .1	21N . R 26E	E		Dwned	х	X	28	28	Olsen	492	10/01/1	5 Sunflowers (lbs)		822	Wheat, Sp. (bu)		29	Com (bu)	75 147	Sunflowers (lbs)			Corn (bu)	147		t, Sp (bu)	
T11198 F8 3 3/10/10	103.0	Corson	ShB	SW 1-4 See		21N . R 27E	E 0.		Owned		XX		16		318	<del> </del>			47 ( 822 (	Com (bu)		147 75	Corn (bu) Barley, Maltime (bu)	34	Sunflowers (lbs)			Corn (bu)	75			╛
T1637 F2 4 3/10/10	228.0		RcC	1(12 Sec		21 R 26			Dwned Dwned			31	15	Olsen		10/01/19				Com (bu)	1		Com (bu)	75	Sunflowers (lbs)			Corn (bu)	75		t. Sp (bu)	
T11199 F3 5 3/10/10 T11199 F6 6 3/10/10	61.0 125.0	Corson	An RaB	SW 1.4 Sec	<u></u>	21N R 27E				X 5.3		29	18	_		+	~{ <del></del>			Wheat. Sp (bu)		29	Sunflowers (lbs)	1.822	Corn (bu)			Wheat, Sp. (bii)	75		(bu) owers (lbs)	-
1764 F1 7 3/10/10	129.4	Corson	ShB	NW 1/4 See		21N .R 27E				X 6.5				Olsen	+		<del></del>		29	Com (bu)		7.5	Sunflowers (lbs)	1.822	Wheat, Sp. (bu)			Corn (bu) Barley (bii)	34			
11329 F1 8 3/10/10	72.4	Corson	ShB	SE 1/4 Sec	6 .T	21N R 27E	E 0.	0.1	Owned	X 12.2	X		22	<del></del>		10/01/1			{ ⊦-	Barley, Malting (bu)	4		Oats (bu)	75	Wheat, Sp. (bu) Sunflowers (lbs)			Wheat. Sp (bii)	29			_
1329 F2 9 3/10/10	295.6	Corson	ShB	W 1/2 Sec		21N . R 27F	[ }			X 16.2	X	32	25			10/01/1			822 822	Wheat, Sp. (bu) Corn (bu)			Com (bu)	75	Sunflowers (lbs)			Corn (bu)	75		it. Sp. (bu)	~
1898 F1 10 3/10/10	139 8	Corson	ShB	NW 1.4 Sec NE 1.4 Sec		21N R 27E	E 0.:			X 20	$\frac{1}{X}$	30	24		+		_		822	Com (bu)			Com (bu)	75	Sunflowers (lbs)			Corn (bu)	75		a, Sp. (bu) a, Sp. (bu)	
1426 F1 11 3/10/10 1930 F1 12A 3/10/10	80.9	Corson	An ShB	NE 14 Sec		21N . R 27E	E 0.		~~~~~~~ <del> </del> }	X 20	╂╫ <sup>ҳ</sup>	-		Olsen			_		822	Corn (bu)		75	Corn (bu)	75	Sunflowers (lbs)			Com (bii)	75		it, Sp. (bu) it, Sp. (bu)	٠
1929 F1 13 3/10/10	89.0	Corson	ShB	SW 14 Sec		21N .R 27E	{ }			X 2.0	T X		16		248	10/01/1			822	Com (bu)			Com (bu)	75	Sunflowers (lbs)		822 61	Corn (bu) Sunflowers (lbs)	1,82		at, Sp. (bu)	٠
1460 F1 14 3/10/10	150.0	Corson	RsB	NE 1-4 Sec	9 .r	22 .R 27	0.3	0.2	Owned	X 18.0	X	30	15		381	4				Sunflowers (lbs)			Corn (bu)	75	Oats (bu)			Sunflowers (fbs)	1,82		u. Sp. (bu)	
1894 F3 15 3/10/10	133.0	Corson	RaA	SE 14 Sec		22 . R 27	0.			X	X	30	16	<del> </del>		10/01/1				Suuflowers (lbs) Com (bu)			Corn (bu) Wheat, Sp (bu)	29	Sunflowers (lbs)		j	Corn (bu)	75		(bu)	
1900 F1 16 3/10/10	315.0	Corson	RsB			22N .R 27E 21N .R 26E				X 6.5	X X	{ <del>} </del>	46 26	Olsen	600 376					Corn (bu)	-		Com (bu)	75	Sunflowers (lbs)			Corn (bu)	75		at, Sp. (bu)	
763 F1   17   3/10/10 892 F2   18   3/10/10	155.5	Corson	RaB DaA		ji }-	21N .R 26E				X 6.5		{ <del>} </del>	23		294	10/01/1			822	Com (bu)		75	Wheat. Sp (bu)	29	Sunflowers (lbs)			Com (bii)	147 75			
892 F3 19 3/10/10	143.0	Corson	SgA	N 1/2 Sec		22N .R 271			cased	X	$\prod x$	29		Olsen		·		1.	822	Com (bu)		75	Wheat. Sp (ba)	29	Sunflowers (lbs)			Corn (bu)	75		(bu)	
1901 F1 20 3/10/10	292.0	Corson	RsB	E 1/2 Sec		22N .R 27I			Leased	X 3.5	X	29	30		+	<del></del>				Corn (bii)		75	Wheat, Sp (bu)	75	Sunflowers (lbs) Sunflowers (lbs)			Corn (bu)	75		at, Sp (bu)	•
10091 F4 21 3/10/10	131.5	Corson	StA	N 1/2 Sec		22N .R 27F			.eased	X	X	29	20			<del></del>				Com (bu)  Dats (bu)		75	Corn (bu) Wheat, Sp. (bu)	29	Corn (bu)			Oats (bu)	61		ey, Malting (bu)	_
1767 F2 22 3/10/10	120,0	{ <del>                                    </del>	StA	E 1/2 Sec.		22N R 271			.cased	X 10.7 X 15.8		30	22		347	+				Oats (bu)		61	Wheat, Sp. (bu)	29	Corn (bu)			Oats (bu)	61	— <del> </del>	ey. Malting (bu)	
1767 F5 23 3/10/10 1767 F6 24 3/10/10	61.0	Corson	Gr ShA	N 1/2 Sec SE 1/4 Sec	h	22N .R 271			Leased	X 3.6	$\prod_{X}^{A}$	30	39		~	+	<del></del>		75	Oats (bu)		61	Wheat, Sp. (bu)	29	Corn (bu)			Oats (bu)	1.87		ey, Malting (bu)	٠
638 FIA 25 3/10/10	156.4	Corson	RsB	812 Sec		22N .R 26E				X 70	X	30	10			10/01/1			75	Sunflowers (lbs)		1.822		34	Corn (bu)		75 75	Sunflowers (lbs) Sunflowers (lbs)	1,82			
638 F1B 26 3/10/10	154.0	Corson	DaA	S 1/2 See	Innered to	22N R 26F		∤ }—	Owned	X 4.0	X	30	10	<del></del>		10/01/1			75	Sunflowers (lbs)		1.822		34 29	Corn (bu)			Oats (bu)	61		ey, Malting (bu)	
1770 F1 27 3/10/10	155.5	Corson	ShA	NW 14 Sec	}{	22N .R 27F			<del></del> []	X 74		30	14			10/01/1				Oats (bu)		61	Wheat, Sp. (bu) Corn (bu)	75	Wheat, Sp. (bu)			Oats (bu)	61		Nowers (lbs)	-
1766 F1 28 3/10/10	99 2	Corson	An	NET4 Sec	<u> </u>	22N .R 27F	E 0.			X 0.0	<del>                                     </del>	31	33 16	-		10/01/1			29	Sunflowers (lbs)	+	1,822	Wheat. Sp (bu)	29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1.83		at, Sp. (bu)	
29   12/29/11 30   12/29/11	229 4 155 7	Corson	VhB RaC	N 1/2 Sec NW 1/4 Sec	Sacranii In	20N .R 25H 21N .R 26H				X 5.7		29	11						822	Wheat, Sp (bu)		29	Cern (bu)	75	Sunflowers (lbs)			Wheat, Sp. (bu)	29		s (bu) s (bu)	
31 12/29/11	68.4	Corson	RnB	N I/2 Sec	سا تسسط	21N R 261				X 4.3	$\  \frac{x}{x} \ $	29	11						822	Wheat, Sp (bu)		29	Com (bu)	75	Sunflowers (lbs)		.822	Wheat, Sp. (bu) Wheat, Sp. (bu)	29		s (bu)	•
32 12/29/11	70.4	·	RpC	NE 14 Sec	4 .1	21N . R 26F	j	{}		X 5.3	X	29	11						822	Wheat, Sp (bn)		29	Corn (bu)	1,822	Sunflowers (lbs) Wheat, Sp. (bu)		29	Wheat, Sp (bu)	29		flowers (lbs)	
33 12/29/11	183.0	Corson	RaB	N1/2 Sec	}	21N .R 261	E 0.			X 24.7	X	31	15				<del>_</del> {} <del>_</del>		29	Wheat, Sp. (bu)		29	Sunflowers (lbs) Sunflowers (lbs)	1,822			29	Wheat, Sp. (bu)	29		flowers (lbs)	
34 12/29/11	38.0	Corson	RcB	NE 1-4 Sec	1	21N .R 26F				X	₩ <u>X</u>	31	15 13			10/01/1			29 29	Wheat, Sp. (bu) Wheat, Sp. (bu)		29	Sunflowers (ibs)	1,822			29	Wheat, Sp (bu)	29	<del></del>	flowers (lbs)	r
35   12/29/11   36   12/29/11	317 7 159 I	Corson	RnB VeB	W 1/2 Sec SE 1/4 Sec		21N .R 25E	E 0,			X 6.1	╂╢╬	31	27						75	Sunflowers (lbs)		1,822		34	Com (bu)		75	Sunflowers (lbs)	1,8		s (bu) flowers (lbs)	
37 12/29/11	157.0	( <del> </del>	Gr	\$1/2 Sec	<u> </u>	21N .R 251	E 0.			x   v.t	Шź	31	21						29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1,822			29	Wheat, Sp. (bu) Wheat, Sp. (bu)	2		cat, Sp. (bu)	-
38 12/29/11	67.0	Corson	RnB	W12 See		21N . R 25I	E 0.	).1 [	Leased	Х		29	17			<del></del>			,822	Wheat, Sp. (bu)		29	Barley, Malting (bu)	29	Sunflowers (lbs) Sunflowers (lbs)		1,822	Corn (bu)			flowers (lbs)	
39 12/29/11	254.2	Corson	RnB	E 1·2 Sec	i	21N . R 25I				X 3.1	X	29	20						,822 ,822	Com (bu)		75 75	Wheat, Sp (bu)	29	Sunflowers (lbs)		1,822	Com (bu)	7.		iflowers (lbs)	-
40 12/29/11	156.5	Corson	SgB	NE 14 Sec		21N . R 25E	}			X	₩ <u>X</u>	30	17			10/01/1				Wheat, Sp (bu)	+	29	Corn (bu)	75			1.822	Wheat, Sp. (bu)	2		n (bu)	
41   12/29/11   42   12/29/11	85 1 73.7	Corson	An ShB	SE 14 Sec. SE 14 Sec.	<b>⊢⊣</b> ⊩	21N R 26F		0.0   1		X	$\prod_{\mathbf{x}}^{\mathbf{X}}$	30					5 Sunflowers (lbs)			Wheat, Sp (bu)			Corn (bu)	75				Wheat, Sp. (bu)			n (bu) eat, Sp (bu)	
43 12/29/11	316.3	Corson	RnB	W 1/2 Sec	- Personal	21N .R 251				X 6.8	$\frac{x}{x}$	30		Olsen						Sunflowers (lbs)			Wheat, Sp. (bu)	29			29 29	Sunflowers (lbs) Sunflowers (lbs)			eat. Sp (bu)	
44 12/29/11	308.7	Corson	VeB	S 1/2 Sec	32 . F	21N .R 251	E 0.	0.2	Leased	X 0.8	X	30		Olsen		<del></del>			29	Sunflowers (lbs)	_		Wheat, Sp (bu)	29				Alfalfa (ton) >1 plant/sq.ft			alfa (ton) >1 plant/sq.ft	
45 12/29/11	[ <del> </del>	Corson	4 }	NE 1/4 Sec.	32 .1	22N .R 261	1: 0.	).5		X 17.4		32		Olsen						Alfalfa (ton) >1 plant/sq.ft Sunflowers (lbs)		1 822	Wheat, Sp. (bu) Wheat, Sp. (bu)	29				Sunflowers (lbs)			icat, Sp. (bu)	_
46 12/29/11 12B 6/5/13	{ }	Corson	RaB		35 T	21N .R 251	E 0.	0.2	Leased			32		Olsen		10/01/1				Cern (bu)	-	75	Com (bu)	75				Com (bu)			neat, Sp. (bu)	
12B 6/5/13 47A 6/5/13	44.7	Corson	ShB ShA	NE 14 Sec.	붜井	21N .R 271 21N .R 271		9 6	Owned		XX	30	7	Olsen		10/01/1			.822	Corn (bu)		75	Corn (bu)	75				Com (ba)			icat, Sp. (bii) icat, Sp. (bii)	
47B 6/5/13	75.9		ShB	NW 1-4 Sec	7 .1	21N R 271	ε 1.	1.3 (	Owned		XX	30		Olsen				1	,822	Com (bu)		75	Com (bu)	75				Com (bu)			uflowers (lbs)	٠
48 6/5/13	293.7	Corson	VhB	E12 See	16 T	21N R 271	15 0.	0.4		X 16.3		30		Olsen					75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)	29	Oats (bu)		01	C.OH (00)	L			•
Total:	·		·																												Total i	ş
Comment	s:	'																													Total	
	re projected va		- ·																													

### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

					Part 3: Plan	ned Nutrient Appl	ication								Lait 7. I	utrient Ap	pireutio				-	_	200				Ď.		4/12
	Date:	1	1/14/12		Operator:	Wulf Cattle Depot		County:	Corson	1			Date:	11/14/12	Operator:		Wulf Ca	attle Depot			County:		Corson	39			Date:	11/1	40.
17.	30.		31.		32.		33.			34.		35.	3	6.	37.			38.					N	Nutrients App	polied				
		Nutrient F	ecommenda	tion - SDSU	_	17-6-3		La constant de la con	Ma	nure Tes	t .	A Ashrabas Y	ield Goal Maximum Manure				Manura	Application		1 1 20100	and the same				April 1981	Tr	otal lbs/acre		Estimat
D (Include maps to	Initial Nutrient	Exten	sion Service	EC-750		Manure App	olication and	d Incorporation	z	0 0		ONi (Rirstde	Maximum Manure ked by soil productivity	Productivity Index)	Acres of		ivialitie	Аррисаціон		Comr	mercial lb	s/acre	Ma	anure lbs/ac	cie	-	otal loordord		years
strate location)	Mgt. Plan -				Manure application	-			z 0 0	K20 20	Date	GL68 XEat)	rage Yields (SD Agricul	ural Statistics Service)	Actual			Date	Time Period										based
	N based				based on:	Type of Manure (Y	ear of	Type of Application (Time		Total	Tested			Quantity of	Nutrient Application	Actual Manu		Manure	When Manure	N	P <sub>2</sub> O <sub>5</sub>	K₂O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	P2O51
Field Yield	fields (acres)	- Av	1	1 40		Application)	220.20	of incorporation)	F 6	5 6		lbs/Ton or lbs/1,000 gal	To meet N needs	Manure per Field	- approximent	Applie	ed	Applied	Applied						100				
or Tract # Goal	(acres)	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	1							100 /100 80																	
			,						are I are I a		T asiasus	1	O.T. codes	576 Tons	64.0	9	Tons/ac	October	Fall	37		0	37	76	117	74	76	117	N/
631 F1 1 61	64.0	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8	_		_	9 Tons/ac 9 Tons/ac	801 Tons	89.0	9	Tons/ac	October	Fall	37	0		37	76	117	74	76	117	N
631 F2 2 61	89.0	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8 2.0 1.3 0		05/25/11	4.1	75,600 Gal/ac	7.786.800 Gal	78.0	75,800	Gal/ac	July	Summer	90	0		86	38	455	176	38	455	N
198 F8 3 57	103.0	176	0	0	Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Liquid	Sprinkling Broadcast (None)		3.4 13.0			11 Tons/ac	2,288 Tons	208.0	11	Tons/ac	October	Fall	44	0		45	92	143	89	92	143	N
637 F2 4 61 199 F3 5 29	208.0 55.5	89	3	0	Nitrogen need Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8		-		11 Tons/ac	611 Tons	55.5	11.	Tons/ac	October	Fall	44	0		45	92	143	89	92	143	N
199 F6 6 75	119.9	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0			9 Tons/ac	1,079 Tons	119.9	9	Tons/ac	October	Fall	37	0		37	76	117	74 88	76 92	143	N
764 F1 7 1,822	122.9	88	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0		-	11 Tons/ac	1,352 Tons	122.9	11	Tons/ac	October	Fall	43	0		45	92 50	143 78	51	50	78	N
329 F1 8 75	60.2	51	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8	8.4 13.0	05/25/11	4.1	6 Tons/ac	361 Tons	60.2	6	Tons/ac	October	Fall	27	0	-	24 37	76	117	70	76	117	N
329 F2 9 75	279.4	70	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8	3.4 13.0	05/25/11	4.1	9 Tons/ac	2,515 Tons	279.4	9	Tons/ac	October	Fall	33 45	0	-	45	92	143	90	92	143	١
898 F1 10 29	139.8	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8			_	11 Tons/ac	1,538 Tons	139.8	- 11	Tons/ac	October	Fall Fall	45	0		45	92	143	90	92	143	١
426 F1 11 29	145.7	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		3.4 13.0	_		11 Tons/ac	1,603 Tons	145.7 80.9	11	Tons/ac	October	Fall	45	13		45	92	143	90	105	143	- 1
930 F1 12A 29	80.9	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0	_		11 Tons/ac	890 Tons 957 Tons	87.0	11	Tons/ac	October	Fall	45	13		45	92	143	90	105	143	1
929 F1 13 29	87.0	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0 8.4 13.0		4.1	11 Tons/ac 11 Tons/ac	1,452 Tons	132.0	11	Tons/ac	October	Fall	45	9		45	92	143	90	101	143	
460 F1 14 29	132.0	91	9	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None) Broadcast (None)			05/25/11		11 Tons/ac	1,463 Tons	133.0	11	Tons/ac	October	Fall	45	9		45	92	143	90	101	143	-
894 F3 15 29	133.0 315.0	91	7 0	0	Nitrogen need Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid Solid	Broadcast (None)		_	05/25/11		0 Tons/ac	0 Tons	315.0	0	Tons/ac			90	0		0	0	0	90	0	143	
900 F1 16 75 763 F1 17 29	149.0	90	0	0	Nitrogen need Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0			11 Tons/ac	1,639 Tons	149.0	11	Tons/ac	October	Fall	46	0		45	92	143	91 91	92 92	143	
392 F2 18 75	176.7	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0			11 Tons/ac	1,944 Tons	176.7	11	Tons/ac	October	Fall	46	0	-	45	92	143	91	92	143	
92 F3 19 75	143.0	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0			11 Tons/ac	1,573 Tons	143.0	11	Tons/ac	October	Fall	46	0	-	45	92	104	91	67	104	
001 F1 20 75	288.5	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8	8.4 13.0	05/25/11	4.1	8 Tons/ac	2,308 Tons	288.5	8	Tons/ac	October	Fall	58	0		33	0	0	91	0	0	
091 F4 21 29	131.5	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8	8.4 13.0	05/25/11	4.1	0 Tons/ac	0 Tons	131.5	0	Tons/ac			91 79	0	-	0		0	79	0	0	
767 F2 22 34	109.3	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8	8.4 13.0	05/25/11	4.1	0 Tons/ac	0 Tons	109.3	0	Tons/ac	-		79	0	-	0	0	0	79	0	0	1
767 F5 23 34	89.3	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0	-	_	0 Tons/ac	0 Tons	89.3	0	Tons/ac			79	0		0	-	0	79	0	0	
767 F6 24 34	57.4	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0	_	_	0 Tons/ac	0 Tons	57.4	0	Tons/ac	-		91	0		0	0	0	91	0	0	
38 F1A 25 61	149.4	91	18	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8		_	_	0 Tons/ac 0 Tons/ac	0 Tons	150.0	0	Tons/ac			91	0		0	0	0	91	0	0	
38 F1B 26 61	150.0	91	18	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0 8	8.4 13.0 8.4 13.0	05/25/11		0 Tons/ac	0 Tons		0	Tons/ac			79	0		0	0	0	79	0	0	
770 F1 27 34	148.1	79	4	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None) Broadcast (None)		8.4 13.0		_	0 Tons/ac	0 Tons		0	Tons/ac			78	0		0	0	0	78	0	0	
766 F1 28 1,822	99.2	78 90	7	0	Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid Solid	Broadcast (None)		8.4 13.0	1000000		0 Tons/ac	0 Tons	229.4	0	Tons/ac			90	0		0	0	0	90	0	0	
29 29 30 61	229.4 150.0	74	50	0	Nitrogen need Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0		_	_	0 Tons/ac	0 Tons	150.0	0	Tons/ac			74	0		0	0	0	74	0	0	
31 61	64.1	74	50	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0	-		0 Tons/ac	0 Tons	64.1	0	Tons/ac			74	0		0	0	0	74	0	0	
32 61	65.1	74	50	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0	8.4 13.0	05/25/1	1 4.1	0 Tons/ac	0 Tons	65.1	0	Tons/ac			74	0	_	0	0	0	72	0	0	
33 1,822	158.3	72	10	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0	8.4 13.0	05/25/1	1 4.1	0 Tons/ac	0 Tons		0	Tons/ac			72	0	_	0	0	0	72	0	0	
34 1,822	38.0	72	10	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0	8.4 13.0	05/25/1	1 4.1	0 Tons/ac	0 Tons	38.0	0	Tons/ac			72	0	_	0	0	0	72	0	0	
35 1,822	317.7	72	30	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			05/25/1	_	0 Tons/ac	0 Tons	317.7	0	Tons/ac			91	0		0	0	0	91	0	0	
36 61	153.0	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0			0 Tons/ac	0 Tons	-	0	Tons/ac	1		72	-		0	0	0	72	0	0	
37 1,822	157.0	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	7.00	8.4 13.0	_	_	0 Tons/ac 0 Tons/ac	0 Tons	67.0	0	Tons/ac			74	0		0	0	0	74	0	0	-
38 29	67.0	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		8.4 13.0	0 05/25/1		0 Tons/ac	0 Tons	251.1	0	Tons/ac			91	0		0	0	0	91	0	0	1
39 1,822	251.1	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)  Broadcast (None)		8.4 13.0			0 Tons/ac	0 Tons	156.5	0	Tons/ac			90	0		0	0	0	90	0	0	
40 1,822	156.5 85.1	72	0	0	Nitrogen need Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid Solid	Broadcast (None)		8.4 13.0		_	9 Tons/ac	766 Tons		9	Tons/ac	October	Fall	35	0		37	_	117	72	76 76	117	1
42 75	73.7	72	0	0	Nitrogen need Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0				9 Tons/ac	663 Tons	73.7	9	Tons/ac	October	Fall	35	0	-	37	_	117	72 91	92	143	
43 29	309.5	91	9	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0				11 Tons/ac	3,405 Tons	309.5	11	Tons/ac		Fall	46	0	_	45	_	143	_	92	143	1
44 29	307.9	91	9	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0	8.4 13.0	0 05/25/1	1 4.1	11 Tons/ac	3,387 Tons		11	Tons/ac		Fall	46 37	_		45		_	_	84	130	1
45 2	142.6	78	12	_	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0	_	_		10 Tons/ac	1,426 Tons		10	Tons/ac		Fall Fall	46	_		45		143	91	92	143	
46 29	317.1	89	7	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0				11 Tons/ac	3,488 Tons	_	20,600	Tons/ac Gal/ac	October	Summer	45	_		45	_	_	90	20	238	
12B 29	44.7	90	20	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0 1.3	_	_	_	39,600 Gal/ac	1,770,120 Gal	44.7	39,600	Tons/ac	July	Commer	53	_		37	_	_	90	76	117	
47A 29	44.5	90	29	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0	_	_	_	9 Tons/ac	401 Tons 3,005,640 Gal	75.9	39,600	Gal/ac	July	Summer	45	_		45	20	238	90	20	238	1
47B 29	75.9	90	23	0	Nitrogen need	Livestock (1st Year)	_		2.0 1.3				0 Tons/ac	3,005,640 Gai		39,000	Tons/ac	July		91	_		1			91			
48 1,822	277.4	91	27	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2 1.0	0.4 15.	0 03/25/1	1 4.1	U TOTIS/AC	0 10115	7.5.														
I Acres:	7,312.3	N	P2O5		Comments:										Comments	ation Estimate for 20	16 Growing S	Season											
	ble for crops:	231,426													ivianure applic	anion Lountaic for 20	saraning o												
	ired by fields:																												
	available bas d all listed field																												_

Plan Year: 2016

Part 5: Nutrient Balance

		41. Nutrien	t Balance			
		Estimated	Estimated			Legume
	E. C. C. C. S. C. A.	Crop N	Crop P <sub>2</sub> O <sub>5</sub>	Nitrogen	*P <sub>2</sub> O <sub>5</sub>	Credit
	Crop Yield,	Removal	removal	Balance	Balance	(Table 2 of
ield#	lb, bu, ton	The second secon	The second secon			EC750)
icia ii		lb/ac	lb/ac	lb/ac	ppm	EC/30)
1	29	72.5	16.2	30	35	
2	29	72.5	16.2	30	29	
3	147	176.4	51.5	30	17	
4	75	90.0	26.3	30	18	
5	75	90.0	26.3	30	21	
6	29	72.5	16.2	31	20	
7	75	90.0	26.3	30	28	
8	34	51.0	13.9	30	24	
9	29	72.5	0.0	30	27	
10	75	90.0	26.3	30	27	
11	75	90.0	26.3	30	27	
12A	75	90.0	26.3	30	20	
13	75	90.0	26.3	30	20	
14	1822	91.1	20.0	29	19	
15	1822	91.1	20.0	29	20	
16	75	90.0	26.3	30	45	
17	75	90.0	26.3	30	29	
18	75	90.0	26.3	30	26	
19	75	90.0	26.3	30	27	
20	75	90.0	26.3	30	32	
21	75	90.0	26.3	30	19	
22	61	79.3	15.3	30	21	
23	61	79.3	15.3	30	24	
24	61	79.3	15.3	30	38	
25	1822	91.1	20.0	30	9	
26	1822	91.1	20.0	30	9	
27	61	79.3	15.3	30	13	
28	61	79.3	15.3	30	32	
29	1822	91.1	20.0	30	15	
30	29	72.5	16.2	31	10	
31	29	72.5	16.2	31	10	
32	29	72.5	16.2	31	10	
33	29	72.5	16.2	31	14	
34	29	72.5	16.2	31	14	
35	29	72.5	16.2	31	12	
36	1822	91.1	20.0	30	26	
37	29	72.5	16.2	31	20	
38	29	72.5	16.2	31	16	
39	75	90.0	26.3	30	19	
40	75	90.0	26.3	30	16	
41	29	72.5	16.2	30	22	
42	29	72.5	16.2	30	22	
43	1822	91.1	20.0	30	19	
44	1822	91.1	20.0	30	18	
45	2	110.0	24.0	32	14	
46	1822	91.1	20.0	32	19	
12B	75	90.0	26.3	30	10	
47A	75	90.0	26.3	30	9	
47B	75	90.0	26.3	30	9	
48	1822	91.1	20.0	30	5	

<sup>\*(</sup>Total Land Application of  $P_2O_5$  in lb/acre - Total Crop Removal of  $P_2O_5$  in lb/acre)/20 + Soil  $P_2O_5$  in PPM

Developed by: Nathan Pesta Page 3-3

### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Part 1: Field Information							Part 2: Estimated Nutrient Requirement																		
	Operator:	Wulf Cattle	Depot					Corson		Dat		1/14/12	Operator:		Wulf Cattle Depot	4	County:	Corson							
17 ID (Include maps to	18.	<del></del>	20	21 Soil map	22	Predicted	24 100 Vegs	25. 26 Exchu		Current Soil Phosphoru		Soil	Actual or Yield Goal     Yields indexed by soil production		iex)		<u> </u>			and Average Yield: or nutrient management purposes.					
lustrate location)	Date added to Plan	acres in	County	unst symbol	Field Location: (1/4 Section, Township, Range)	soil loss - RUSLE2	Control 6	ded a	<u>:</u>   _	(ppm)	(ppm)	Sample	O County Average Yields (SD Agri Previous Year	icultural Statistics o		ar I		Year 2		Year 3			ar 4 County Yield		Year 5 Cor
Field ne or Tract #		neid		Symoon		(T/ac/yr)	I Buffer	icres	0-2	2-4' 0-6" P Te		Date	( )	County Actual Yield Yield	Сгор		Yield Goal	Crop County Yield C		Crop Coun Yiel			Yield Goal	Crop	Y
	ا اسمسسسا ا						,					1	7 600 2	20	Oats (bu)		61	Com (bu)	75	Sunflowers (lbs)	1.8	22 Wheat, Sp. (bu)	55	Oats (bu)	
1631 F1 1	3/10/10	67.1	Corson	DaA	NW 1-4 Sec. 3 .1 21N .R 26E NW 1-4 Sec. 3 .1 21N .R 26E		Owned X Owned X	31	X 30					29	Oats (bu)				75	Sunflowers (ibs)		Wheat, Sp (bu)	55	Oats (bu) Wheat, Sp. (bu)	
1631 F2 2 11198 F8 3	3/10/10 3/10/10	89.0 103.0	Corson	RnB ShB	NW 1 4 Sec. 3 .1 218 .R 26F SW 1 4 Sec 4 .T 218 .R 27F		Owned	+	X 30					147	Com (bu)		147	((00)	147	Sunflowers (lbs)		15   Corn (bu) 22   Corn (bu)	75	Oats (bu)	
1637 F2 4	3/10/10	228.0		RcC	E12 Sec 5 1 21 R 26	0.1	Owned X	20.0	X 30				Corn (bu)	75	Oats (ba)		61	Danie, I transition of the state of the stat	34 75	Sunflowers (lbs) Sunflowers (lbs)		22   Com (bu)	75	Wheat, Sp. (bu)	
1199 F3 5	3/10/10	61.0		An	SW 1 4 Sec 5 . T 21N .R 271	0.1	Owned X	5.5	X 30	21 Olse	n 348	10/01/16	Com (bu)	75	Wheat, Sp. (bu)		29	CARTON	1,822	Corn (bu)	7		29	Corn (bu)	
1199 F6 6	3/10/10	125.0	Corson	RaB	SE 14 Sec 5 . I 21N .R 27E	0.1	Leased X	51	X 31			-		29	Com (bu)		75 1,822	Militario (100)	1.822	Wheat, Sp. (bu)	7	9 Corn (bu)	75	Sunflowers (lbs)	
1764 FI 7	3/10/10	129.4	Corson	ShB	NW 1-4 Sec 6 . T 21N . R 27E	0.1	Leased X	6.5	X 30		m 350			75	Sunflowers (lbs)		75	Julia Cita (100)	61	Wheat, Sp. (bu)	2	9 Barley (bu)	34		
329 F1 8		72.4	Corson	ShB	SE 14 Sec 6 . T 21N .R 27E		{	12.2	X 30					34 29	Com (bu)		75		75	Sunflowers (lbs)		22 Wheat, Sp (bu)	29	Com (bu)	
29 F2 9	-	295.6		ShB	W 1/2 Sec 7 .T 21N .R 27E NW 1 4 Sec. 8 .T 21N .R 27E	0.5		16.2	X 30					75	Wheat, Sp (bu)		29	Com (bu)	75	Sunflowers (lbs)		22 Com (bu)	75	Wheat, Sp. (bu) Wheat, Sp. (bu)	
	3/10/10	139.8	Corson	ShB	NW 1-4 Sec. 8 . T 21N .R 27E	-{}	Leased X Owned X	2.0	X 30			+	-{ }	75	Wheat, Sp (bu)		29	Com (ou)	75	Suaflowers (lbs)		22   Corn (bu)	75	Wheat, Sp (bu)	
	3/10/10	147.7	Corson	ShB	NE 14 Sec 8 . 1 21N . N 27E		Owned X	1 - 1	X 30			10/01/16		7.5	Wheat, Sp. (bii)		29	Conton	75	Sunflowers (lbs)	-	122   Corn (bu) 122   Corn (bu)	75	Wheat, Sp. (bu)	
	3/10/10	89.0	Corson	ShB	SW 14 Sec 9 . T 21N . R 27E		{	2.0	X 30				-	75	Wheat, Sp. (bu)		29	Com (547)	75	Sunflowers (lbs)		Sunflowers (lbs)	1.822	Wheat, Sp. (bit)	
60 F1 14		150.0		RsB	NE 14 Sec 9 . T 22 .R 27	0.2		18.0	X 29	v	n 381	10/01/16	Sunflowers (lbs)	1,822	Wheat, Sp (bu)		29	Corn (bu)	75 75	Oats (bu)		d Sunflowers (lbs)	1,822	Wheat, Sp. (bu)	
	3/10/10	133.0		RaA	SE 14 Sec 9 . 1 22 R 27	0.1	Leased X		X 29				~ }	1.822	Wheat, Sp (bu)		75	Corn (bu) Wheat, Sp. (bu)	29	Sunflowers (lbs)		Corn (bu)	75	Com (bu)	
0 F1 16	3/10/10	315.0	Corson	RsB	E 1-2 See 10 Y 22N . R 271	0.2	Leased X		X 30					75	Com (bu)		29	maca. op. (ou)	75	Sunflowers (lbs)		Com (bu)	75	Wheat, Sp. (bu)	
3 F1 17	3/10/10	155.5		RaB	SE 14 Sec 13 . 1 21N .R 261		Leased X	6.5	X 30	<del></del>			Com (bu)	75	Wheat, Sp (bu) Com (bu)		75	Con (ou)	29	Sunflowers (lbs)	I,	Corn (bu)	1.17	Corn (bu)	
2 F2 18		176.7		DaA	N 1-2 Sec 15 .1 22N .R 27E	1.0	Leased X	1-1-	X 30				Corn (bu)	75	Corn (bu)		75	Wheat. Sp. (bu)	29	Sunflowers (lbs)		K22 Com (bu)	75	Com (bu)	_
	3/10/10	143.0		SgA	N 1-2 Sec 15 . I 22N R 27F		Leased X	1 35	X 30				-	75	Corn (bu)		75	Wheat, Sp. (bu)	29	Sunflowers (lbs)		822 Corn (bu)	75	Corn (bu) Wheat, Sp. (bu)	
1 F1 20		292.0		RsB	E 1/2   Sec   16   T   22N   R   27E   N 1/2   Sec   19   T   22N   R   27E	0.5	Leased X	3.5	X 30			<del></del>		75	Wheat, Sp (bu)		29	Com (bu)	75	Sunflowers (lbs)		822 Corn (bu)	61	Barley, Malting (bu)	-
7 F2 22	}	131.5 120.0		StA	N 1/2 Sec 19 .T 22N .R 278 E 1/2 Sec 30 .T 22N .R 278	0.1	Leased X	10.7	X 30				-	61	Barley, Malting (bu)		34	THE CONTRACTOR OF THE CONTRACT	29	Corn (bu)		75 Oats (bu) 75 Oats (bu)	61	Barley, Malting (bu)	•
57 F2 22 57 F5 23		105.1		Gr	N 1/2 Sec 31 . T 22N . R 271		Leased X	15.8	X 30					61	Barley, Malting (bu)		34		29	Corn (bu)		75 Oats (bu)	61	Barley, Malting (bu)	
67 F6 24		61.0		ShA	SE 14 Sec 31 . 1 22N .R 271		Leased X	3.6	X 30		en 332	10/01/19	Oats (bu)	61	Barley, Malting (bu)		34	Wheat, Sp (bu)	29 34	Corn (bu)		75 Sunflowers (lbs)	1,822	Oats (bu)	
38 F1A 25	}	156.4		RsB	S 1:2 Sec 34 . T 22N . R 261		Owned X	7.0	X 30	9 Ols		10/01/10		1,822	Oats (bu)		61	Barley, Malting (bu)	34	Corn (bu)		75 Sunflowers (lbs)	1.822		
8 F1B 26	<b></b>	154.0	Corson	DaA	\$1:2 Sec 34 . T 22N . R 261	0.1	Owned X	4.0	X 31		~			1,822	Oats (bu)		61 34	Barley, Malting (bu) Wheat, Sp. (bu)	29	Com (bu)		75 Oats (bu)	61	Barley, Malting (bu)	
70 F1 27		155.5	Corson	ShA	NW 1-4 Sec 34 . 1 22N . R 271		Leased X	7.4	X 3					61	Barley, Malting (bu) Sunflowers (lbs)		1,822	Cort (bu)	75	Wheat, Sp (bu)		29 Oats (bii)	61	Sunflowers (lbs)	_
66 F1 28		99,2	Corson	An	NE 14 Sec 34 . 1 22N . R 271		Leased X	0.0	X 3		-			1,822	Wheat, Sp. (bu)		29	Wheat, Sp (bu)	29	Wheat, Sp. (bu)		29 Suntlowers (lbs)	1,822		
29		229 4	Corson	VhB	N 1/2 Sec 4 1 20N R 251		Leased X	57	X 3			10/01/1		29	Oats (bu)		61	Com (bu)	75	Sunflowers (lbs)		822 Wheat, Sp. (bu)	29	Oats (bu)	
30	12/29/11	155 7		RaC	NW 1-4 See 4 .T 21N .R 261 N 1/2 See 4 .1 21N .R 261		Owned X Owned X	<del></del>	X 3 X 3					29	Oats (bu)		61	Corn (bu)	75	Suntlowers (ibs)		822 Wheat. Sp (bu)	29	Oats (bu)	-
31		70.4		RnB RpC	N 1/2 Sec 4 .1 21N .R 261 NE 1 4 Sec 4 .1 21N .R 261		Owned X	5.3	X 3					29	Oats (bn)		61	Com (bu)	75	Sunflowers (lbs)		822 Wheat, Sp (bu) 29 Wheat, Sp (bu)	29		-
33		183.0		RaB	N 1/2 Sec 7 . T 21N . R 261		Leased X	24.7	X 3					29	Sunflowers (lbs)		1,822	Sunflowers (fbs)	1,822			29 Wheat, Sp (bu) 29 Wheat, Sp (bu)	29	Sunflowers (lbs)	
34		38.0		RcB	NE 14 Sec 7 . T 21N .R 26	-{}	Leased X		Х 3		en 339	10/01/1	Wheat, Sp (bu)	29	Sunflowers (lbs)		1,822	Sunflowers (lbs)	1.822			29 Wheat, Sp (bu)	29	Sunflowers (lbs)	
35	12/29/11	317.7	Corson	Rn8	W 1 2 Sec 10 . T 21N . R 251		Leased X		X 3			10/01/1	~ · · · · · · · · · · · · · · · · · · ·	29	Sunflowers (lbs)		1,822	Sultification (100)	34	Com (bu)		75 Sunflowers (lbs)	1,822	Oats (bu)	
36	12/29/11	159 1	Corson	VeB	SE 14 Sec 10 .T 21N .R 251	0.2	Leased X		X 3					1.822	Oats (bu)		1,822	Barley, Malting (bii) Sunflowers (lbs)	1,822			29 Wheat, Sp (bu)	29	Sunflowers (lbs)	
37		157 0		Gr	8 1-2 Sec 11 . T 21N . R 251		Leased X		X 3				<del></del>	29	Sunflowers (lbs) Wheat, Sp (bu)		29	Barley, Malting (bii)	34	Sunflowers (lbs)		,822 Wheat, Sp. (bu)	29		
38	m   manuscramers	67.0		RnB	W12 Sec 12 .T 21N .R 251		Leased X	<del></del>	X 3			10/01/1		75	Sunflowers (lbs)		1,822	Wheat. Sp (bu)	29	Sunflowers (lbs)		.822 Corn (bu)	75	·	
39		254.2	Corson	RnB	E 1-2 Sec 14 . T 21N . R 259		Leased X	<del></del>	X 3 X 3					75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	29	Sunflowers (lbs)		,822 Com (bu)	75	Sunflowers (ibs)	
40		156.5 85.1	Corson	SgB	NE 1-4 Sec 23 . T 21N .R 251 SE 1-4 Sec 24 . T 21N .R 261		Leased X	<del></del>	X 3					29	Corn (bu)		75	Com (bu)	75	Sunflowers (ibs)		.822 Wheat, Sp. (bu)	29		-
	12/29/11	ļ ļ.	Corson		SE 14 Sec 24 . T 21N . R 261		Leased X		X 3				Wheat, Sp (bii)		Com (bu)		75	Corn (bu)	75			,822 Wheat, Sp. (bu) 29 Sunflowers (lbs)		Wheat, Sp. (bu)	
43	12/29/11	316.3		RnB	W 1/2 Sec. 26 . 7 21N R 250		Leased X		X 3				Smiflowers (lbs)		Wheat, Sp (bu)		29	Wheat, Sp (bu)	29			29 Sunflowers (lbs)		Wheat, Sp. (bu)	
44	12/29/11	308.7		VeB	S 1 2 Sec 32 T 21N R 251		Leased X	0.8	X 3	18 OI:	en 280	10/01/1	Sunflowers (lbs)		Wheat, Sp. (bu)		29		29 29			75 Alfalfa (ton) >1 plant/so	<del></del>	Alfalfa (ton) >1 plant/sc	sq f
45	12/29/11	160.0		RcB	NE 1/4 Sec 32 . 1 22N . R 261	E 0.5	Owned X	17.4	X 3				8 Alfalfa (ton) >1 plant/sq.ft.	2	Alfalfa (ton) >1 plant/sq	.ft	29	Wheat, Sp. (bu) Wheat, Sp. (bu)	29			29 Sunflowers (lbs)	1,82		
46	12/29/11	3171		RaB	W 1/2 Sec 35 . T 21N . R 251		Leased X		X 3				5 Sunflowers (lbs)	1,822 75	Wheat, Sp. (bu) Wheat, Sp. (bu)		29	Corn (ba)	75			.822 Corn (bu)	75		
	6/5/13	44,7		ShB	NE 14 Sec 9 . 1 21N .R 271		Leased X		X 3				6 Corn (bu)	75	Wheat, Sp (bu)		29	Corn (bu)	75			.822 Corn (bu)	75		
47A	6/5/13	44.5	Corson	ShA	NW 1-4   Sec   9   .T   21N   .R   27l   NW 1-4   Sec   9   .T   21N   .R   27l	E 1.9 E 1.3	Owned X Owned X		X 3 X 3				6 Com (bu) 6 Com (bu)	75	Wheat, Sp. (bu)			Corn (bu)	75			75   Sunflowers (lbs)	75	Wheat, Sp. (bii) Wheat, Sp. (bii)	
		75.9	Corson	ShB																				/ FINERS SO THE	

Total: 7,551.9

Comments:

Soil Tests are projected values only, based off previous soil tests, estimated yields and nutrients applied

Previous Year = 2016 Year 1 = 2017

Total lbs of N and P2 Total lbs of N and P2 Total lbs of N and P Adequate a However, P2O5 is in excess of removal. At this rate, it will take approximately 7 year(

#### NUTRIENT MANAGEMENT PLAN FOR SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

					Part 3: Plan	ned Nutrient App	lication									Part 4: N	lutrient Ap	plicatio	n								Detai		14/12
		Date:	11/	14/12	Operator:	Wulf Cattle Depot	0.8.2.1.2.0.	County:		Corson				Date:	11/14/12	Operator:		Wulf Ca	attle Depot			County:	Со	son	39.		Date:	111	40.
17.		30	11/	31	32	n an came a cpor	33.	- County		3	4.		35.	36.		37.			38.						s Applied				
.,,		T		commendation - SDS	U			STORES -		Manu	re Test	<b>Q</b>	A Ashiabre Yield Goal Maximus		aliantian Poto			Manure	Application		-	V-116-4		Manure	N. S. C.		Total lbs/acr	е	Estimat
Field ID (Include maps	sto	Initial Nutrient	Extensi	on Service EC-750		Manure Ap	plication an	nd Incorporation		z g		Or	Nie Bir 8tdexed by soil p	m Manure Approductivity (Prod	uctivity Index)	Acres of		Manara			Comn	nercial lbs/a	acre	Manue	DS/ACIO	-			years t reapplica
illustrate location)		Mgt. Plan -			Manure application			T		anic N P2O5	₩ Da	ate or	County Average Yields	(SD Agricultural	Statistics Service)	Actual Nutrient	1. Sec. 735.00	0.200	Date	Time Period							00	ν о	based
	1	N based			based on:	Type of Manure ()	'ear of	Type of Application (Time	Tota	norga Total I	Tes Tes		lbs/Ton or To meet		Quantity of	Application	Actual Manu Applie		Manure	When Manure	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N P <sub>2</sub>	O <sub>5</sub> K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	K₂O	P <sub>2</sub> O <sub>5</sub> ra
F	ield Yield	fields (acres)	N	P <sub>2</sub> O <sub>5</sub> K <sub>2</sub> O		Application)		of incorporation)		5 5	F		bs/1,000 gal	Ma	nure per Field		Аррис		Applied	Applied									
Name or Tract	# Goal	, , , ,	- " -	1 205																						1	1	65	N/A
TICOL EL		(10	79	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	10 84	13.0 05/2	5/11	4.1 5 Tor	ns/ac	320 Tons	64.0	5	Tons/ac	October	Fall	59		0	20 4	2 65	79 79	42	65	N/A
1100111	1 61 2 61	64.0 89.0	79	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2				4.1 0 Tor	ns/ac	0 Tons	89.0		Tons/ac			79	0		00 4	4 529		44	529	N/A
	3 57	103.0	176	0 0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3 0.5	6.0 06/0	6/11	1.1 87,900	Gal/ac 9	,053,700 Gal	78.0	88,100	Gal/ac	July	Summer	76 79	0		00 4	320	79	0		N/A
	4 61	208.0	79	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	13.0 05/2	5/11	4.1 0 Tor		0 Tons	208.0		Tons/ac			72	0				72	0		N/A
	5 29	55.5	72	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	13.0 05/2		4.1 0 Tor		0 Tons	55.5		Tons/ac			89	0				89	0		N/A
T11199 F6	6 75	119.9	89	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8.4				ns/ac	0 Tons	119.9		Tons/ac			91	0				91	0		N/A
T1764 F1	7 1,822	122.9	91	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8.4				ns/ac	0 Tons	60.2		Tons/ac			90	0				90	0		N/A
T11329 F1	8 75	60.2	90	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			13.0 05/2	_		ns/ac	0 Tons	279.4		Tons/ac			90	0				90	0		N/A
	9 75	279.4	90	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		_	13.0 05/2		4.1 0 Tor	ns/ac	0 Tons	139.8		Tons/ac			72	0				72	0	-	N/A
	10 29	139.8	72	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			13.0 05/2 13.0 05/2			ns/ac	0 Tons	145.7		Tons/ac			72	0				72	0		N/A
	11 29	145.7	72	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		_	13.0 05/2			ns/ac	0 Tons	80.9		Tons/ac			72	0			-	72	0		N/
	12A 29	80.9	72	0 0	Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid Solid	Broadcast (None) Broadcast (None)			13.0 05/2			ns/ac	0 Tons	87.0		Tons/ac			72	0				72	0		N/
	13 29 14 29	87.0	72	0 0	Nitrogen need Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			13.0 05/2			ns/ac	0 Tons	132.0		Tons/ac			74	0		-		74	10		N/
	14 29 15 29	132.0	74	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)				5/11	4.1 0 To	ns/ac	0 Tons	133.0		Tons/ac			74	10		-		90	0		N
	16 75	315.0	90	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8.4	13.0 05/2	25/11	4.1 0 To	ins/ac	0 Tons	315.0		Tons/ac			90	0		_	-	72	0		N
	17 29	149.0	72	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	13.0 05/2	25/11	4.1 0 To	ins/ac	0 Tons	149.0		Tons/ac			72	0				90	0		N
	18 75	176.7	90	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	13.0 05/2	25/11	4.1 0 To	ins/ac	0 Tons	176.7		Tons/ac			90	0				90	0		N
	19 75	143.0	90	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	13.0 05/2	25/11	4.1 0 To	ns/ac	0 Tons	143.0		Tons/ac			90	0				90	0		N
	20 75	288.5	90	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	-	25/11		ins/ac	0 Tons	288.5	9	Tons/ac	October	Fall	35	0		37	76 117	7 72	76	117	N
T10091 F4	21 29	131.5	72	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8.4		25/11		ns/ac	1,184 Tons	131.5	6	Tons/ac	October	Fall	27	0		24	50 78	51	50	78	N
T1767 F2	22 34	109.3	51	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8.4	_	25/11		ns/ac	656 Tons 536 Tons	109.3 89.3	6	Tons/ac	October	Fall	27	0		24	50 78	51	50	78	N
T1767 F5	23 34	89.3	51	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		_	13.0 05/2			ons/ac	344 Tons	57.4	6	Tons/ac	October	Fall	27	0		24	50 78	_	50	78	N
	24 34	57.4	51	0 0	Nitrogen need	Livestock (1st Year)	Solid		_		13.0 05/2	_		ons/ac	1,494 Tons	149.4	10	Tons/ac	October	Fall	38	0		41	34 130		84	130	I N
	25 61	149.4	79	17 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8.4		25/11		ons/ac	1,500 Tons	150.0	10	Tons/ac	October	Fall	38	0		_	84 130		84	130	N N
	26 61	150.0	79	17 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None) Broadcast (None)		1.0 8.4		25/11		ons/ac	889 Tons	148.1	6	Tons/ac	October	Fall	27	0			50 78		50	78 143	N N
	27 34	148.1	51	5 0	Nitrogen need	Livestock (1st Year) Livestock (1st Year)	Solid Solid	Broadcast (None)	_	1.0 8.4		25/11		ons/ac	1,091 Tons	99.2	11	Tons/ac	October	Fall	46	0		_	92 143		92 76	117	N N
	28 1,822	99.2	91 72	10 0		Livestock (1st Year)	-	Broadcast (None)			13.0 05/2	_		ons/ac	2,065 Tons	229.4	9	Tons/ac	October	Fall	35	0			76 117 84 130	_		130	N N
	29 29 30 61	229.4 150.0	78	14 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)				25/11	4.1 10 To	ons/ac	1,500 Tons	150.0	10	Tons/ac	October	Fall	37	0			84 130 84 130	_	_	130	l N
	31 61	64.1	78	14 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8.4		25/11	4.1 10 To	ons/ac	641 Tons	64,1	10	Tons/ac	October	Fall	37	0			84 13		84	130	N
	32 61	65.1	78	14 0		Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	13.0 05/2	25/11	4.1 10 To	ons/ac	651 Tons	65.1	10	Tons/ac	October	Fall	37	0			92 14	-		143	N
	33 1,822	158.3	90	11 0	-	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	13.0 05/2	25/11	4.1 11 To	ons/ac	1,741 Tons	158.3	11	Tons/ac	October	Fall	45	0			92 14	_	_	143	1
	34 1,822	38.0	90	11 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	13.0 05/2	25/11		ons/ac	418 Tons	38.0	11	Tons/ac	October	Fall Fall	45	0		_	92 14	_	92	143	1
	35 1,822	317.7	90	15 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)		1.0 8.4		25/11		ons/ac	3,495 Tons	317.7	11	Tons/ac	October	Fall	38	0		_	84 13	0 79	84	130	l N
	36 61	153.0	79	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	_	1.0 8.4	_	25/11		ons/ac	1,530 Tons	153.0 157.0	11	Tons/ac		Fall	45	0		45	92 14	3 90	92	143	N
	37 1,822	157.0	90	0 0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)			13.0 05/2			ons/ac	1,727 Tons 603 Tons	67.0	9	Tons/ac	October	Fall	35	0		37	76 11		_	117	1
	38 29	67.0	72	0 0	-	Livestock (1st Year)		The second secon		1.0 8.4		25/11		ons/ac	2,762 Tons	251.1	11	Tons/ac	October	Fall	46	0			92 14	_	_	143	1
	39 1,822	251.1	91	2 0		Livestock (1st Year)	Solid	Broadcast (None)  Broadcast (None)	1	1.0 8.4		25/11		ons/ac	1,722 Tons	156.5	11	Tons/ac	October	Fall	46	0		_	92 14	_	_	143	-
	40 1,822	156.5	91	7 0	Nitrogen need	Livestock (1st Year)	Solid				13.0 05/			ons/ac	936 Tons	85.1	- 11	Tons/ac	October	Fall	45	0			92 14	_	_	143	1
	41 75	85.1	90	0 0	Nitrogen need	Livestock (1st Year)					13.0 05/			ons/ac	811 Tons	73.7	11	Tons/ac	October		45	0		_	92 14	_		117	1
	42 75 43 29	73.7 309.5	90 72	0 0		Livestock (1st Year)	_				13.0 05/			ons/ac	2,786 Tons		9	Tons/ac	_	-	35	_			76 11 76 11		-	_	
	44 29	307.9	72	0 0		Livestock (1st Year)					13.0 05/			ons/ac	2,771 Tons	307.9	9	Tons/ac	October			0			76 11 84 13	_	_	7.7.5	
	45 2	142.6	78	5 0	_	Livestock (1st Year)	-				13.0 05/			ons/ac	1,426 Tons	142.6	10	Tons/ac		200	37	0			76 11	_		117	
	46 29	317.1	70	0 0		Livestock (1st Year)					13.0 05/		4.1 9 To	ons/ac	2,854 Tons	317.1	9	Tons/ac	-		33				16 19	_	-	190	
	12B 29	44.7	72	60 0		Livestock (1st Year)			_	_	6.0 06/				1,412,520 Gal	44.7	31,600	Gal/ac	July	Summer		0		-		72			
	47A 29	44.5	72	70 0		Livestock (1st Year)		Broadcast (None)		_	13.0 05/			ons/ac	0 Tons	44.5	21.600	Tons/ac	fulu	Summer		0		36	16 19	90 72		190	
	47B 29	75.9	72	70 0		Livestock (1st Year)	Liquid	Sprinkling	_		6.0 06/				2,398,440 Gal	75.9	31,600	Gal/ac Tons/ac	July	Sulliller		0				72			
	48 29	277.4	72	105 0		Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0 8.4	13.0 05/	25/11	4.1 O To	ons/ac	0 Tons			TONS/AC	1										
	I Acres:	7,312.3	N	P <sub>2</sub> O <sub>5</sub>	Comments:											Comments													
		able for crops:	231,426													Manure applie	cation Estimate for 2	017 Growing S	season										
	205 requ	aired by fields:	354,370	142,218																									
		e available bas ld all listed field																											

Plan Year: 2017

Part 5: Nutrient Balance

		41. Nutrien	t Balance			
		Estimated	Estimated			Legume
	10000	Crop N	Crop P <sub>2</sub> O <sub>5</sub>	Nitrogen	*P <sub>2</sub> O <sub>5</sub>	Credit
	Crop Yield,	Removal	removal	Balance	Balance	(Table 2 of
Field #	lb, bu, ton	lb/ac	lb/ac	lb/ac		EC750)
1010111					ppm	107307
1	61	79.3	15.3	30	36	
2	61	79.3	15.3	30	26	
3	147	176.4	51.5	30	18	
4	61	79.3	15.3	30	17	
5	29	72.5	16.2	30	20	
6	75	90.0	26.3	30	19 27	-
7	1822 75	91.1 90.0	20.0 26.3	30 30	24	
8	75	90.0	0.0	30	26	
9	29	72.5	16.2	30	26	
10	29	72.5	16.2	30	26	-
11 12A	29	72.5	16.2	30	19	-
12A 13	29	72.5	16.2	30	19	-
14	29	72.5	16.2	31	18	-
15	29	72.5	16.2	31	19	_
16	75	90.0	26.3	30	44	
17	29	72.5	16.2	30	28	
18	75	90.0	26.3	30	25	
19	75	90.0	26.3	30	26	
20	75	90.0	26.3	30	31	
21	29	72.5	16.2	30	22	
22	34	51.0	13.9	30	23	
23	34	51.0	13.9	30	26	
24	34	51.0	13.9	30	40	
25	61	79.3	15.3	30	12	
26	61	79.3	15.3	30	13	
27	34	51.0	13.9	30	14	
28	1822	91.1	20.0	30	36	
29	29	72.5	16.2	30	18	
30	61	79.3	15.3	30	13	
31	61	79.3	15.3	30	13	
32	61	79.3	15.3	30	13	
33	1822	91.1	20.0	30	18	
34	1822	91.1	20.0	30	18	-
35	1822	91.1	20.0	30	16	
36	61	79.3	15.3	30	29	
37	1822	91.1	20.0	30	24	
38	29	72.5	16.2	31	19	
39	1822	91.1	20.0	30	23	
40	1822	91.1	20.0	30	19	
41	75	90.0	26.3	30	25	
42	75 29	90.0 72.5	26.3 16.2	30 30	26 22	
43	29	72.5	16.2	30	21	
44	29	110.0	24.0	30	17	
45	29	72.5	16.2	30	22	-
46 12P	29	72.5	16.2	30	11	
12B	29	72.5	16.2	30	9	
47A	29	72.5	16.2	30	10	
47B 48	29	72.5	16.2	30	5	

<sup>\*(</sup>Total Land Application of  $P_2O_5$  in lb/acre - Total Crop Removal of  $P_2O_5$  in lb/acre)/20 + Soil  $P_2O_5$  in PPM

Developed by: Nathan Pesta

Section D: Application Site Summary & Best Management Practices

							ion Site Sur		attle Depot			
								wuii Ca	ittle Depot			
Field Id Area	Useable Acreage(Acres)	Land Use	Quarter	s	Ť	R	Owner of Land	Easements	*Nitrogen Risk Assessment	#Runoff Setbacks	Application Rate Limitations	^Best Management Practices
1	64.0		NW 1/4	3	21 N	26 E		Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
2	89.0	Cropland Irrigated	NW 1/4	3	21 N	26 E	Wulf Cattle	Owned	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling, and napplication when ground has potential for runoff
3	103.0		SW 1/4	4	21 N	27 E		Yes	High	No	Crop N Removal	
4	208.0	Cropland	E 1/2	5	21 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop in Removal	
5	55.5	Cropland	SW 1/4	5	21 N	27 E	Sharon Walker	Yes	High	Yes		Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling Delay Fall manure applications until soil temperatures drop below 50 degrees
6	119.9	Cropland	SE 1/4	5	21 N	27 E	Sharon Walker	Yes	High	Yes	Crop N Removal	F, No Till, Soil Test prior to application of nitrogen, manure sampling
7	122.9	Cropland	NW 1/4	6	21 N	27 E	Bonnie Schott	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling Delay Fall manure applications until soil temperatures drop below 50 degrees
8	60.2	Cropland	SE 1/4	6	21 N	27 E	Dallas & Dee Schott	Yes	High	Yes		F, No Till, Soil Test prior to application of nitrogen, manure sampling
9	279.4	Cropland		7	21 N	27 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	
10	139.8	Cropland		8	21 N	27 E	Dallas & Dee Schott	Yes	High	No		Delay Fall manure applications until soil temperatures drop below 50 degree F, No Till, Soil Test prior to application of nitrogen, manure sampling Delay Fall manure applications until soil temperatures drop below 50 degree
11	145.7	Cropland	NE 1/4	8	21 N	27E	Dallas & Dee Schott	Yes	High	Yes		F, No Till, Soil Test prior to application of nitrogen, manure sampling
12A	80.9		NE 1/4	9	21 N	27 E	Wulf Cattle	Owned	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
13	87.0	Cropland	SW 1/4	9	21 N	27 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
14 15 16	132.0 133.0 315.0	A local control of the second control of the	NE 1/4 SE 1/4 E 1/2	9 9 10	22 N 22 N 22 N	27 E 27 E 27 E	Dallas & Dee Schott	Yes Yes Yes	High Low Low	Yes Yes Yes	Crop N Removal Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degre
17	149.0	Cropland	SF 1/4	13	21 N	26 E	Bonnie Schott	Yes	High	Yes	Crop N Removal	F. No Till, Soil Test prior to application of nitrogen, manure sampling
18	176.7	Cropland		15	22 N		Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
19	143.0	Cropland		15	22 N		Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
20	288.5	Cropland	E 1/2	16	22 N	27 E	Dallas & Dee Schott	Yes	High High	Yes	1	Delay Fall manure applications until soil temperatures drop below 50 degre F, No Till, Soil Test prior to application of nitrogen, manure sampling Delay Fall manure applications until soil temperatures drop below 50 degre F, No Till, Soil Test prior to application of nitrogen, manure sampling
21	131.5	Cropland	IN 1/2	19	22 N	2/ E	Gary Rau	169	riigii	INO	Orop 14 (tomoval	
22	109.3	Cropland	E 1/2	30	22 N	27 E	Gary Rau	Yes	High	Yes		Delay Fall manure applications until soil temperatures drop below 50 degree F, No Till, Soil Test prior to application of nitrogen, manure sampling Delay Fall manure applications until soil temperatures drop below 50 degree
23	89.3	Cropland	NE 1/4	31	22 N	27 E	Gary Rau	Yes	High	Yes	Crop N Removal	F, No Till, Soil Test prior to application of nitrogen, manure sampling
24 25	57.4 149.4	Cropland Cropland	SE 1/4	31 34	22 N 22 N	27 E	Gary Rau Wulf Cattle	Yes Owned	High Low	Yes Yes		Delay Fall manure applications until soil temperatures drop below 50 degree F, No Till, Soil Test prior to application of nitrogen, manure sampling

DeHaan, Grabs Associates, LLC Mandan, ND Dodge City KS

Field Id	Useable								*Nitrogen Risk	#Runoff	Application Rate	AD - 4 Management Depotings
Area	Acreage(Acres)	Land Use	Quarter	S	Ŧ	R	Owner of Land	Easements	Assessment	Setbacks	Limitations	^Best Management Practices
26	150.0	Cropland	S 1/2	34	22 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
27	148.1	Cropland	NW 1/4	34	22 N	27 E	Gary Rau	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
28	99.2	Cropland	NE 1/4	34	22 N	27 E	Gary Rau	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
29	229.4	Cropland		4	20 <b>N</b>	25 E		Yes	High	No		Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling No Till, Soil Test prior to application of nitrogen, manure sampling
30	150.0	Cropland	NW 1/4	4	21 <b>N</b>		Wulf Cattle	Owned	Low	Yes	Crop N Removal	
31	64.1	Cropland	N 1/2	4	21 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
32	65.1	Cropland	NE 1/4	4	21 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
33	158.3	Cropland	N 1/2	7	21 N	26 E	Golden Hills LLP	Yes	Low	Yes	Crop N Removal	
34	38.0	Cropland	NE 1/4	7	21 N	26 E	Golden Hills LLP	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
35	317.7	Cropland		10	21 N	25 E	Golden Hills LLP	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
36	450.0	·		40	. 04 N	25. 5	Caldan Hilla III D	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
36	153.0	Cropland		10	21 N	25 E			Low	No	Crop N Removal	
37	157.0		S 1/2	11	21 N	25 E		Yes		No	Crop N Removal	
38	67.0		W 1/2	12	21 N	25 E		Yes	Low	Yes	Crop N Removal	er ere tre tre treatment to the treatment of the treatment of the second
39	251.1		E 1/2	14	21 N	25 E		Yes	Low	No	Crop N Removal	and the same of th
40	156.5	Cropland	NE 1/4	23	21 N	25 E	Dallas & Dee Schott	Yes	Low	INO	Crop in Kemovai	A CONTRACTOR OF THE CONTRACTOR
41	85.1	Cropland	SE 1/4	24	21 N	26 E	Bonnie Schott	Yes	High	No	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
												Delay Fall manure applications until soil temperatures drop below 50 degrees
42	73.7	Cropland	SE 1/4	24	21 N	26E	Bonnie Schott	Yes	High	No	Crop N Removal	F, No Till, Soil Test prior to application of nitrogen, manure sampling
43	309.5	Cropland		26	21 N	25 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
	· · · · · · · · · · · · · · · · · · ·											Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
44	307.9	Cropland		32	21 N	25 E		Yes	High	Yes		
45	142.6	Cropland		32	22 N		Wulf Cattle	Owned	Low	Yes	Crop N Removal	the state of the s
46	317.1	Cropland Irrigated	W 1/2	35	21 N	25 E	Dallas & Dee Schott	Yes	Low	No	Crop N Removal	
12B	44.7		NE 1/4	9	21 N	27 E	Dallas & Dee Schott	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
47A	44.5	entario de la Carta de Carta d	NW 1/4	9	21 N		Wulf Cattle	Owned	Low	No	Crop N Removal	
		Irrigated										
47B	75.9		NW 1/4	9	21 N	27 E		Owned	Low	No	Crop N Removal	the same of the sa
48	277.4	Cropland	E 1/2	16	21 N	27 E	Wulf Cattle	Owned	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
Total Land	7,312.3											" I have the trave a high leaching rick"

Total Land 7,312.3
\*Using SD bulletin no SD 190-7-1 for groundwater leaching. Assessments based on a soils "Saturated hydraulic conductivity" Soil maps units that have a Ksat value of 10 micrometers/sec or greater will be considered to have a high leaching risk." # As shown on the Water Quality Risk Assessment map 100' setback distances will practiced.

\*Best mangagement practices are shown in section O

Section E: Inventory of Water Wells

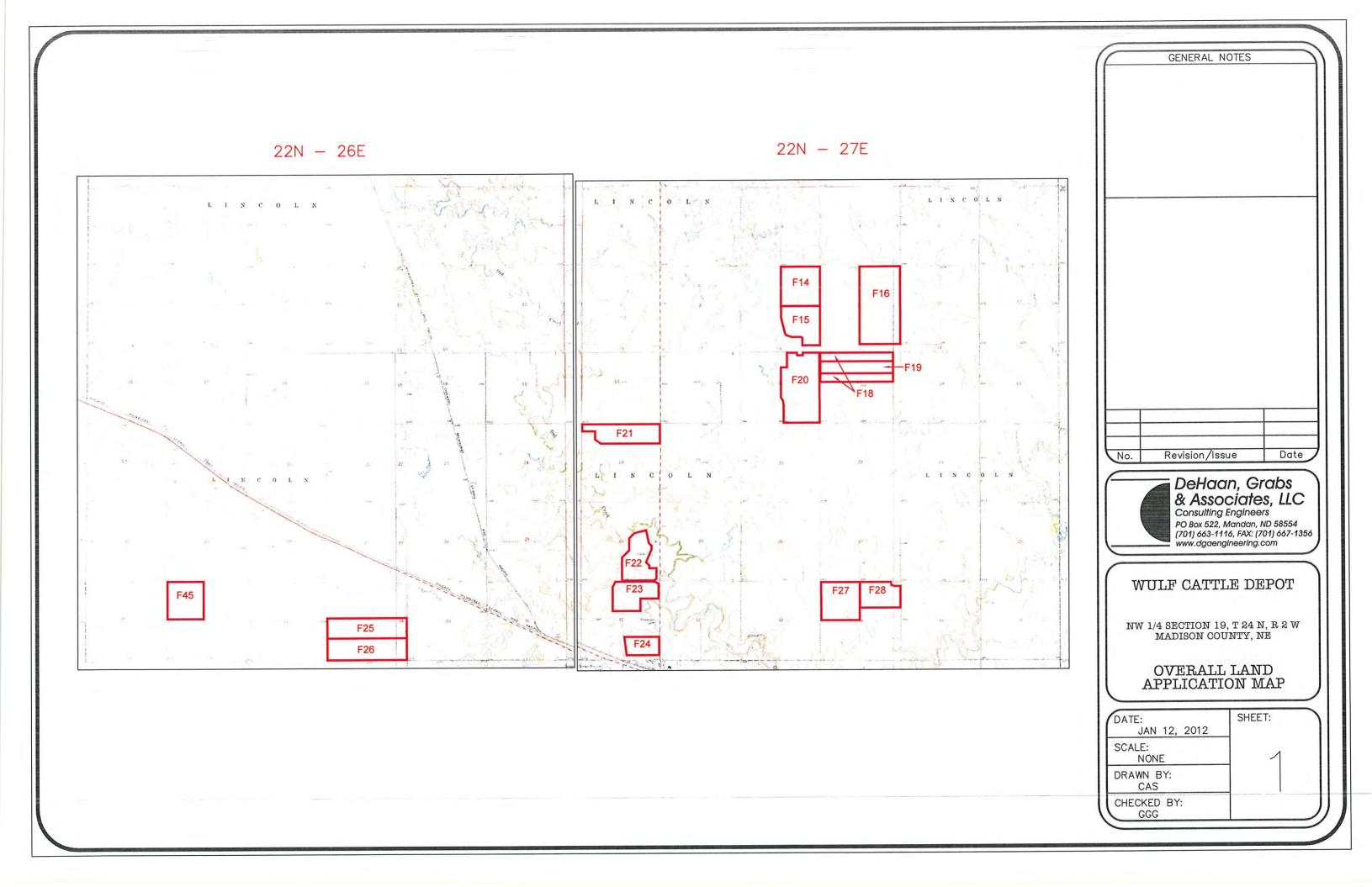
# Inventory of Water Wells

Field	Location	Well Depth	Use of Well <u>1</u> /	Required Setback Distance From Well For Manure Application (Ft.)				
ID.	(Legal)	(Ft.)		County Rule	State Rule			
5	NW/4 of SE/4, Sec 5, T 21N, R 27 E	115	Private	NA	250			
6	SW/4 of NE/4, Sec 5 T 21 N, R 27 E	125	Producer Owned	NA	150			
7	NW/4 of NW/4, Sec 6, T 21 N, R 27 E	116	Private	NA	250			
Near 14	SE/4 of NW/4, Sec 22, T 22N, R 27 E	220	Private	NA	250			
37	NE/4 of SE/4, Sec 11 T 21N, R 25 E	180	Private	NA	250			

# 1/ Well Use Categories:

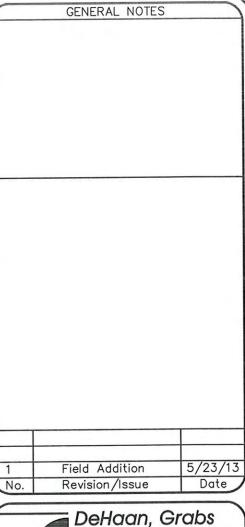
- Producer (Owned)
- Private
- Public
- Irrigation

Section F: Field Maps



GENERAL NOTES 21N - 26E 21N - 25E F2 F17 F39 Date Revision/Issue No. F40 DeHaan, Grabs & Associates, LLC Consulting Engineers PO Box 522, Mandan, ND 58554 (701) 663-1116, FAX: (701) 667-1356 www.dgaengineering.com F41 F42 WULF CATTLE DEPOT NW 1/4 SECTION 19, T 24 N, R 2 W MADISON COUNTY, NE F46 OVERALL LAND APPLICATION MAP SHEET: DATE: JAN 12, 2012 SCALE: NONE DRAWN BY: CAS CHECKED BY: GGG

20N - 25E 21N - 27E F29





DeHaan, Grabs & Associates, LLC Consulting Engineers PO Box 522, Mandan, ND 58554 (701) 663-1116, FAX: (701) 667-1356 www.dgaengineering.com

### WULF CATTLE DEPOT

NW 1/4 SECTION 19, T 24 N, R 2 W MADISON COUNTY, NE

OVERALL LAND APPLICATION MAP

DATE:	SHEET:
JAN 12, 2012	
SCALE: NONE	
DRAWN BY: CAS	
CHECKED BY:	

Customer(s): DALLAS SCHOTT

Legal Description: 3-21-26

Field Office: Mitchell - ANMT Agency: USDA - NRCS

2,000

1,500



500

500

1,000



NMP\_2010

№ Manure Application Fields

Setback and/or Exclusion Area

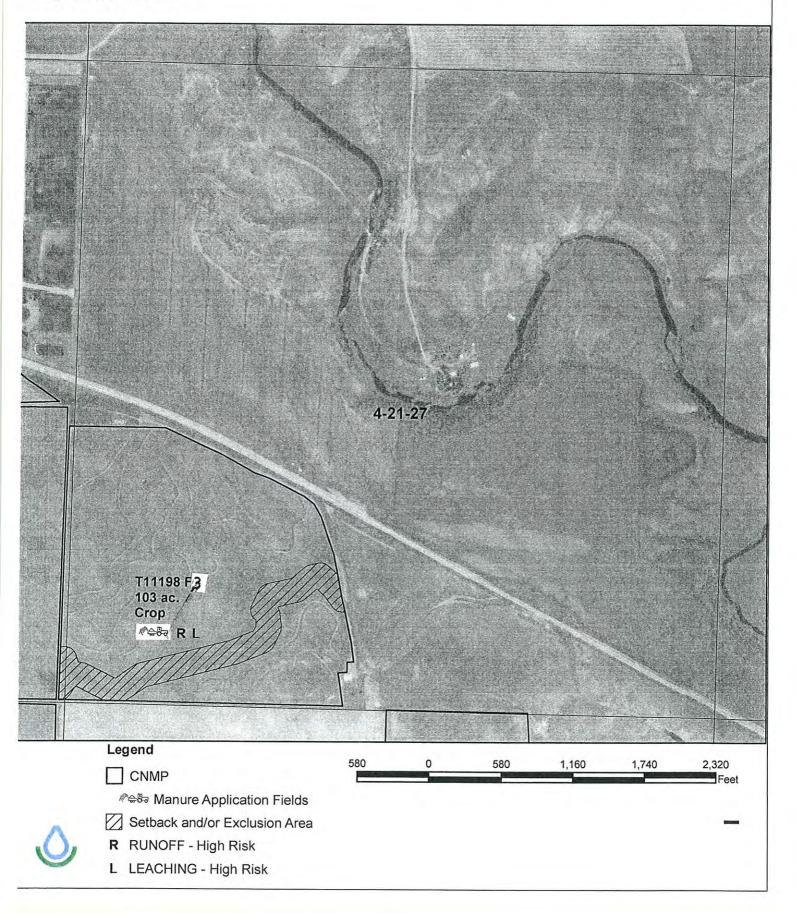
R RUNOFF - High Risk

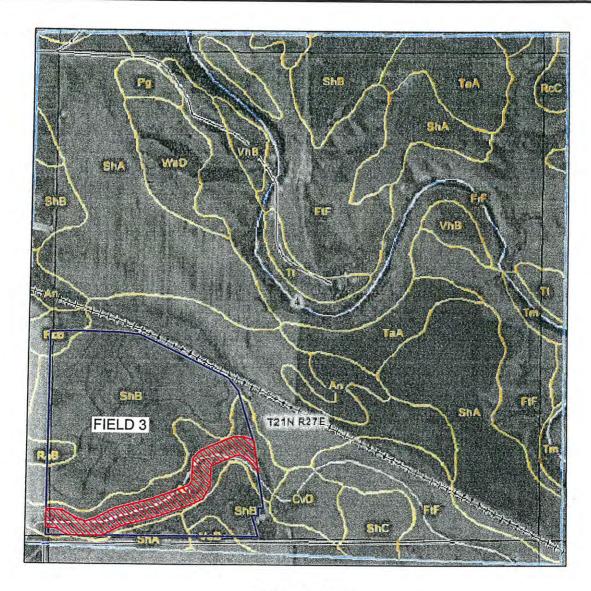
L LEACHING - High Risk

# Soils Map Field Office: Mitchell - ANMT ,.tomer(s): DALLAS SCHOTT Agency: USDA - NRCS Legal Description: 3-21-26 RcĐ Field 2 DaA 3-21-26 Legend Soils Map CNMP\_2010 1,320 1,760 440 880 Sections

Customer(s): DALLAS SCHOTT

Legal Description: 4-21-27





#### SCALE, FEET 500 1000 1500 2000

#### Legend:

An Arnegard loam

CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes

FrF Flasher-Rock outcrop complex, 30 to 60 percent slopes

FtF Flasher-Telfer complex, 15 to 40 percent slopes

Pg Pits, gravel
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

ShA Shambo loam, 0 to 2 percent slopes

ShB Shambo loam, 2 to 6 percent slopes ShC Shambo loam, 6 to 9 percent slopes

TaA Tally fine sandy loam, 0 to 6 percent slopes

Tm Trembles fine sandy loam, channeled

Tt Trembles fine sandy loam, terrace
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

WaD Wabek gravelly sandy loam, 2 to 35 percent slopes

# Land Application Area

# WULF CATTLE DEPOT SOILS MAP

4 - 21N - 27E CORSON COUNTY, SD



# **DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

		Revision	
Date:	12/28/11	Date:	
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Checked By:	GGG	Checked By:	
Page:		Page:	

Customer(s): DALLAS SCHOTT

Legal Description: 5-21-26

Field Office: Mitchell - ANMT Agency: USDA - NRCS





☐ CNMP\_2010

Manure Application Fields

Setback and/or Exclusion Area

R RUNOFF - High Risk

L LEACHING - High Risk

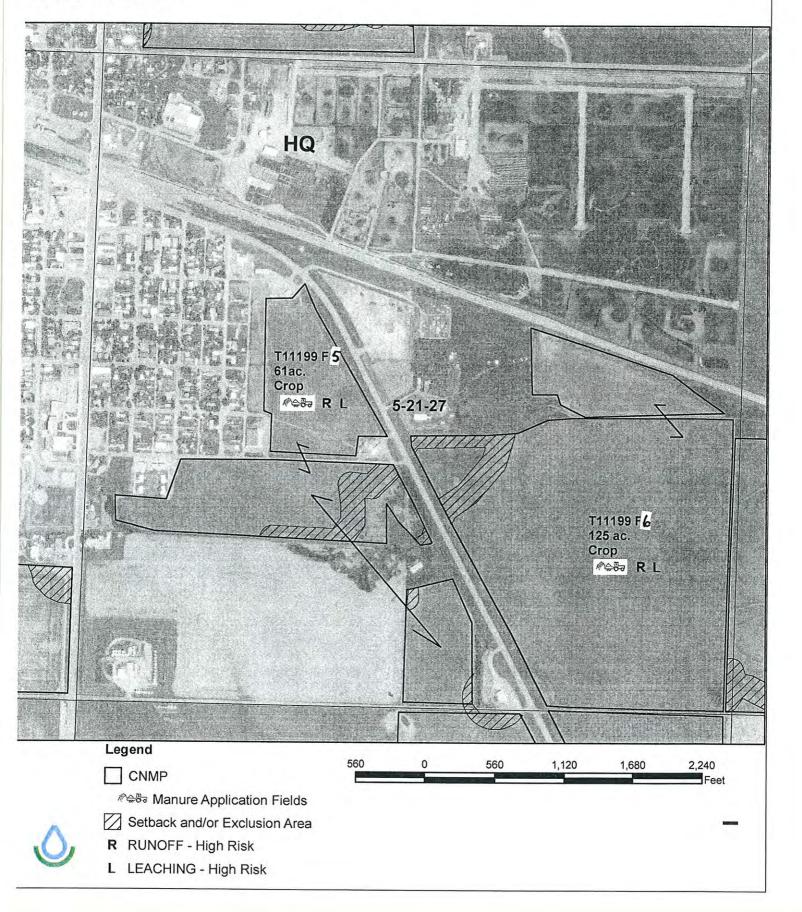


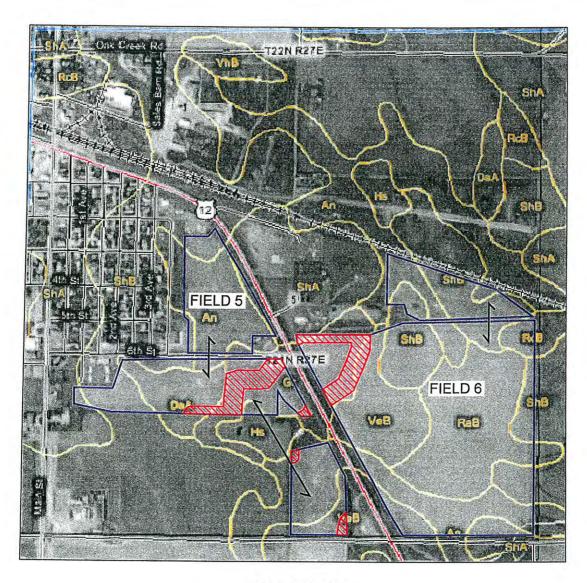


# Soils Map Field Cifica: Michell- ANAT Asmeria: CALLAS SCHOTT Agency: UBDA - NACE Legal Description: 5-31-36 Legand 🔲 Saita Map CHMP Sections

Customer(s): DALLAS SCHOTT

Legal Description: 5-21-27





### SCALE, FEET 0 500 1000 1500 2000

#### Legend:

An Arnegard loam
DaA Daglum loam, 0 to 3 percent slopes
FtF Flasher-Telfer complex, 15 to 40 percent slopes
Gr Grail silty clay loam
Hs Heil silt loam
RaB Reeder loam, 2 to 6 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes ShA Shambo loam, 0 to 2 percent slopes

ShB Shambo loam, 2 to 6 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

# WULF CATTLE DEPOT SOILS MAP

5 - 21N - 27E CORSON COUNTY, SD

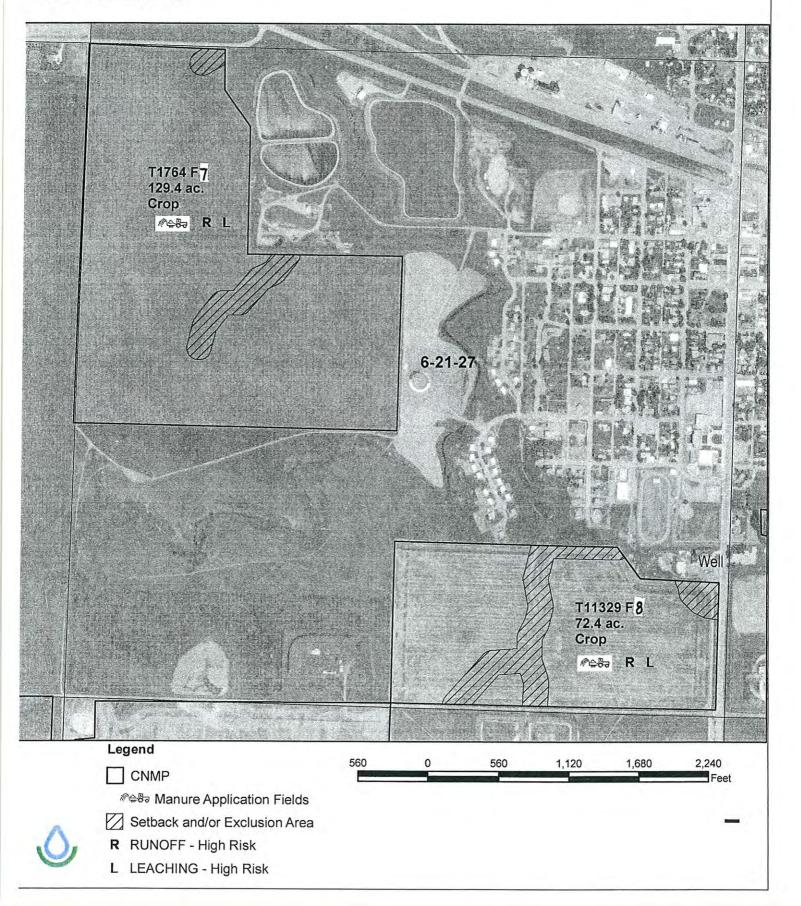


DeHaan, Grabs & Associates, LLC Consulting Engineers

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Customer(s): DALLAS SCHOTT

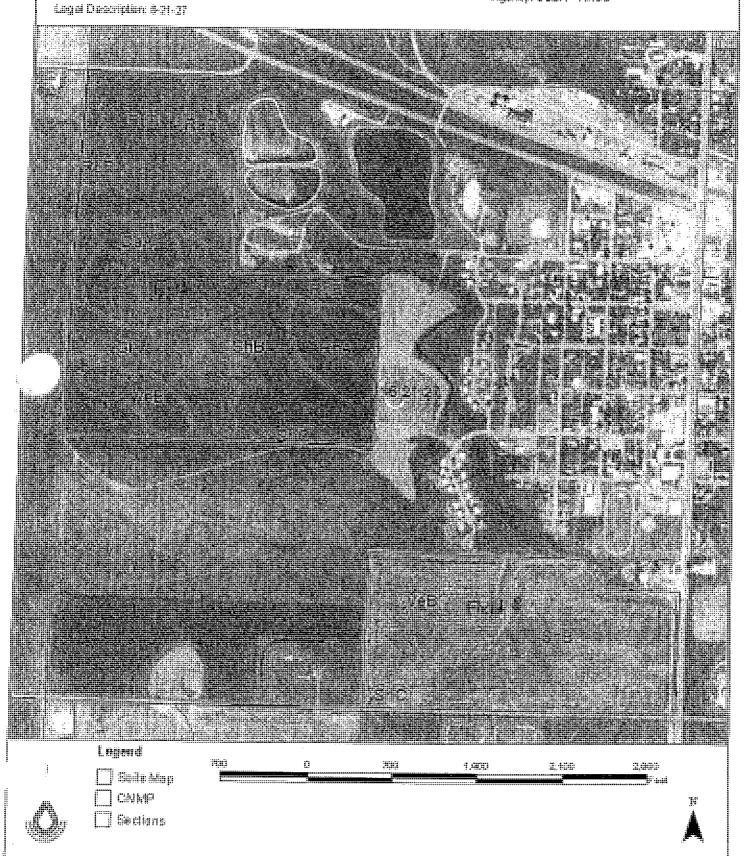
Legal Description: 6-21-27

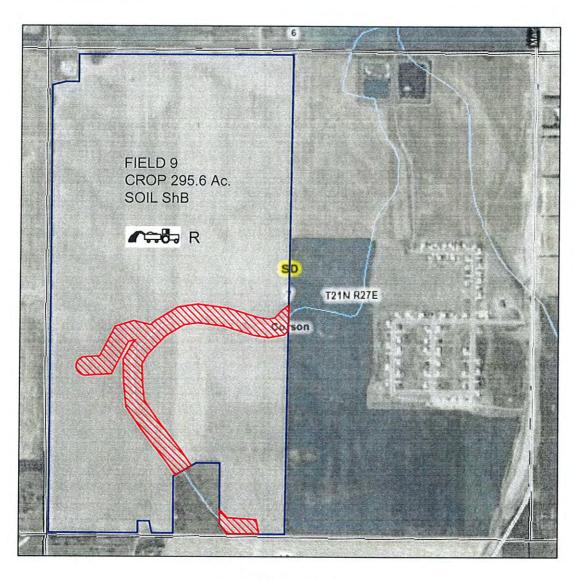


#### Sais Meg

adomoniji: Callas schott

Fight Office: Milchell - ANNOT Agency: USCA - NECS







Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

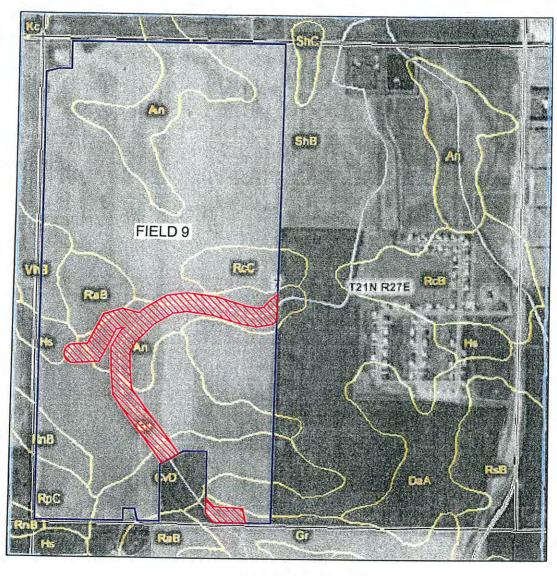
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

7 - 21N - 27E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
Checked By: GGG	Checked By:
Page:	Page:



#### SCALE, FEET 500 1000 1500 2000

#### Legend:

An Arnegard loam

CaF Cabba-Amor loams, 15 to 60 percent slopes

CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes

DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam

Hs Heil silt loam

Kc Korchea loam, channeled

RaB Reeder loam, 2 to 6 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes

RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes

RsB Rhoades-Daglum loams, 0 to 9 percent slopes

SgA Savage silt loam, 0 to 3 percent slopes ShB Shambo loam, 2 to 6 percent slopes

ShC Shambo loam, 6 to 9 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

# WULF CATTLE DEPOT SOILS MAP

Land Application Area

7 - 21N - 27E CORSON COUNTY, SD



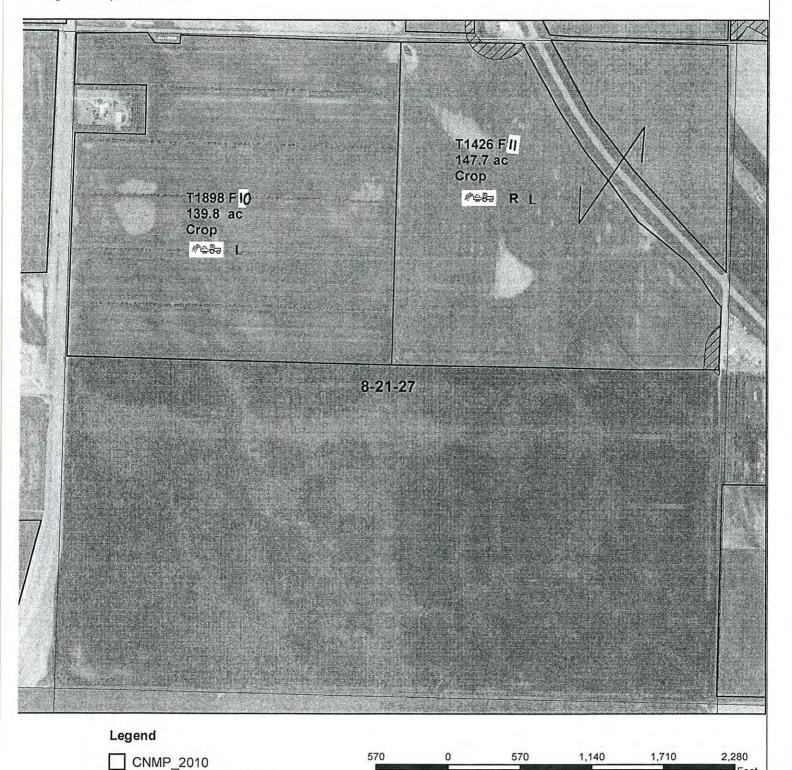
DeHaan, Grabs & Associates, LLC Consulting Engineers

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Customer(s): DALLAS SCHOTT

Legal Description: 8-21-27

Field Office: Mitchell - ANMT Agency: USDA - NRCS





Manure Application Fields✓ Setback and/or Exclusion Area

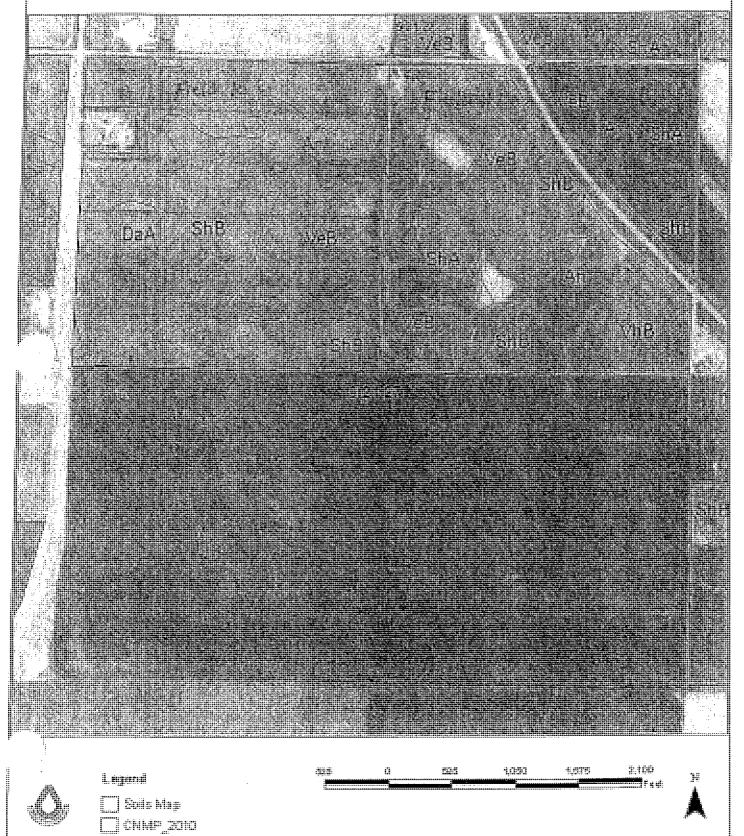
R RUNOFF - High RiskL LEACHING - High Risk

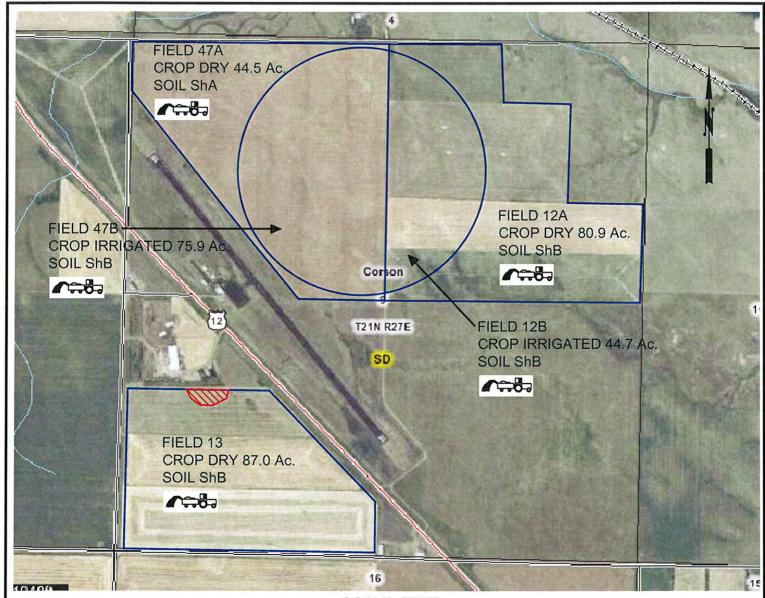
#### Sols Map

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Lagai Centriplice: 6-74-33

Panig Critica: Milichael - APMT Agency: LAICA - MRCB





SCALE, FEET 0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

9 - 21N - 27E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

Consulting Engineers
PO Box 522 Mandan ND 58554

			Revision
Date:	12/28/11	Date:	5/23/13
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Checked By:	GGG	Checked By:	GGG
Page:		Page:	



SCALE, FEET 1000 1500 500 2000

#### Legend:

An Arnegard loam

CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes

FrF Flasher-Rock outcrop complex, 30 to 60 percent slopes FtF Flasher-Telfer complex, 15 to 40 percent slopes

RaA Reeder loam, 0 to 2 percent slopes

RaB Reeder loam, 2 to 6 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes

ShA Shambo loam, 0 to 2 percent slopes ShB Shambo loam, 2 to 6 percent slopes

ShC Shambo loam, 6 to 9 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

# WULF CATTLE DEPOT SOILS MAP

9 - 21N - 27E CORSON COUNTY, SD

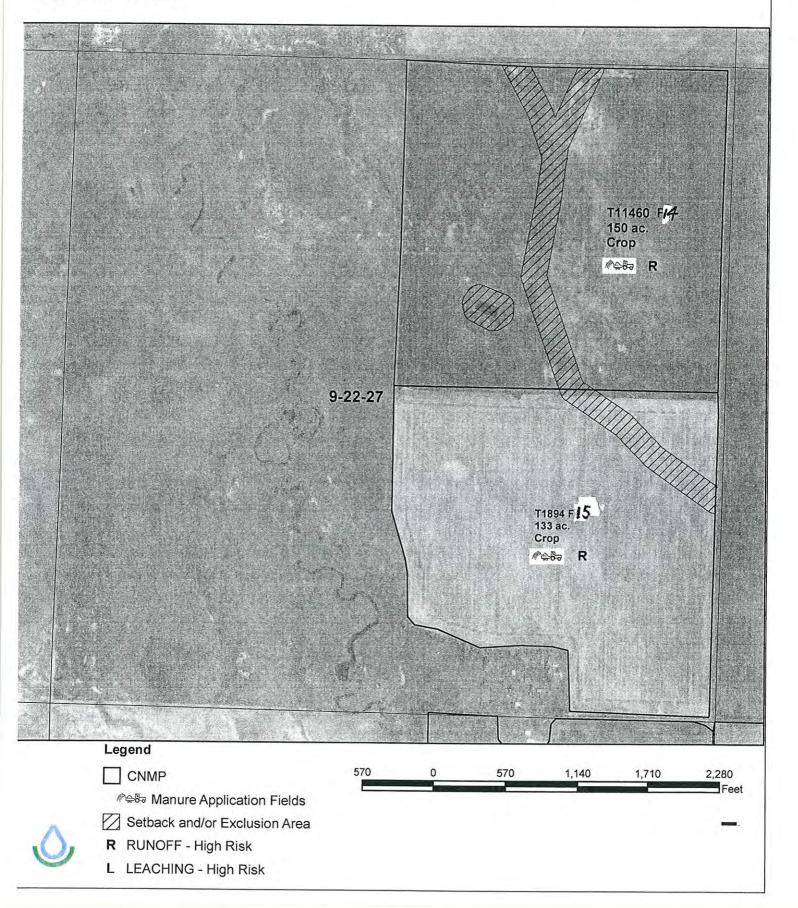


# **DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

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Customer(s): DALLAS SCHOTT

Legal Description: 9-22-27

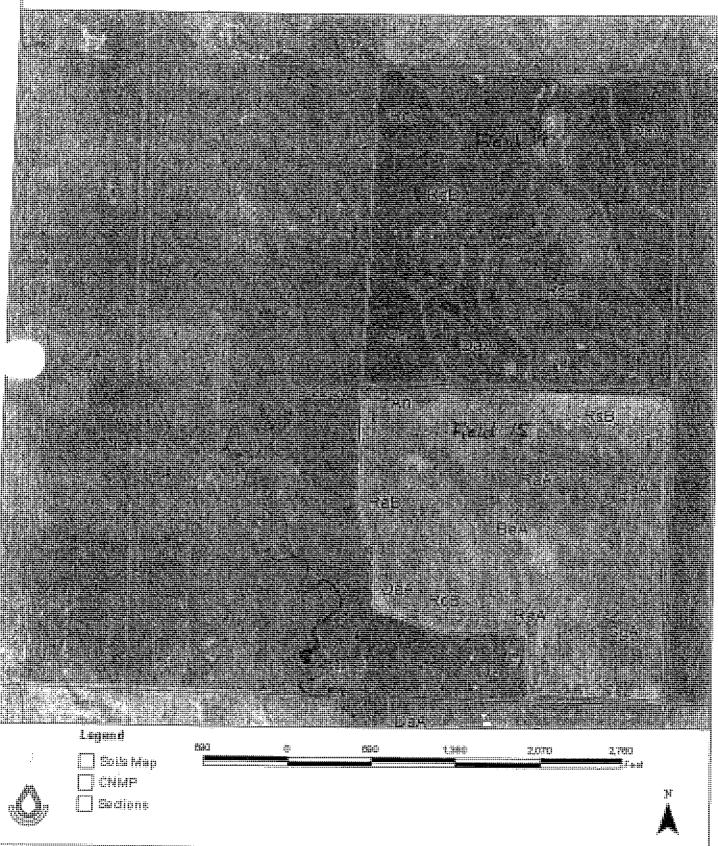


### Sols Map

Joneski Callas Schott

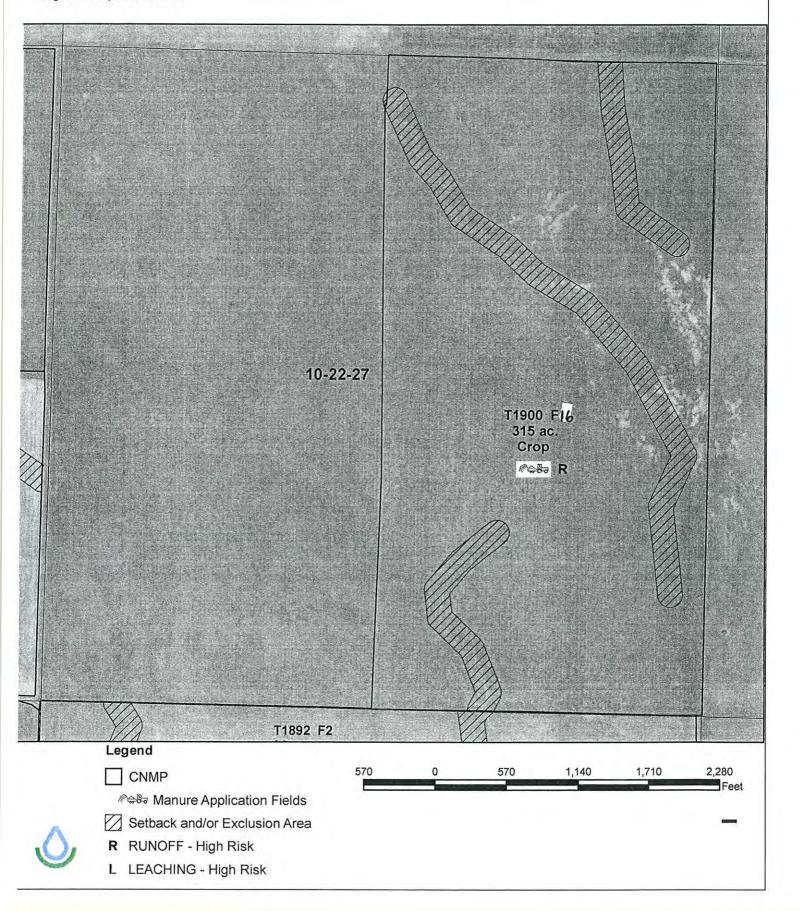
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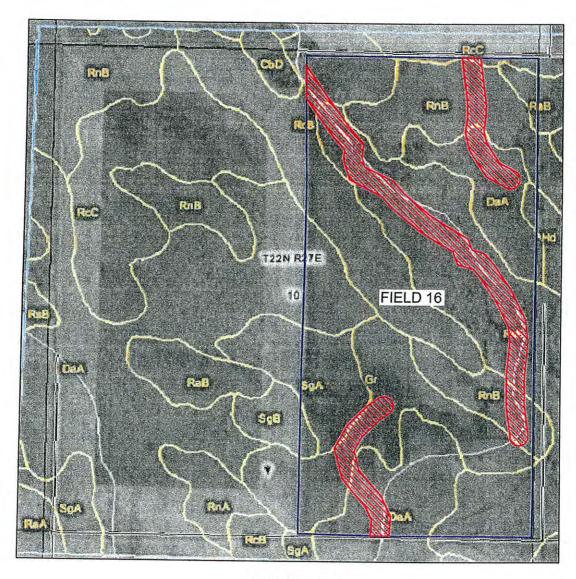
Field Cilica: Milebell - ANMT Agency: USCA - MICS



Customer(s): DALLAS SCHOTT

Legal Description: 10-22-27







#### Legend:

BeA Belfield-Daglum complex, 0 to 3 percent slopes CbD Cabba-Reeder loams, 6 to 25 percent slopes

DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam Hd Harriet loam

RaA Reeder loam, 0 to 2 percent slopes

RaB Reeder loam, 2 to 6 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnA Regent silty clay loam, 0 to 2 percent slopes RnB Regent silty clay loam, 2 to 6 percent slopes

RsB Rhoades-Daglum loams, 0 to 9 percent slopes

SgA Savage silt loam, 0 to 3 percent slopes

SgB Savage silt loam, 3 to 6 percent slopes

# Land Application Area

# WULF CATTLE DEPOT SOILS MAP

10 - 22N - 27E CORSON COUNTY, SD

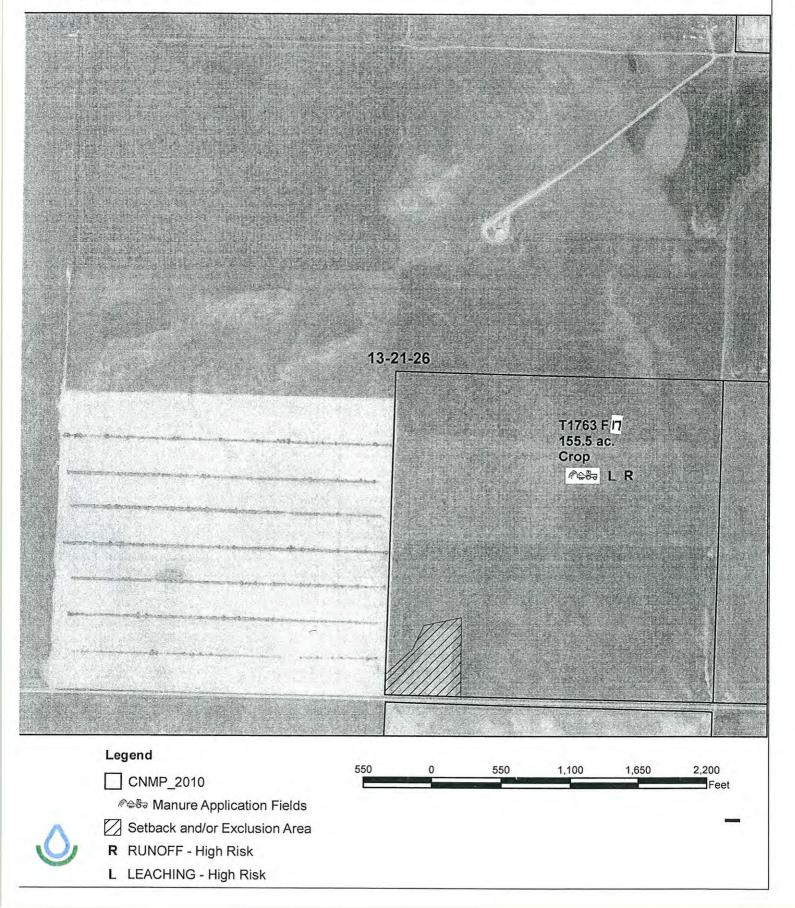


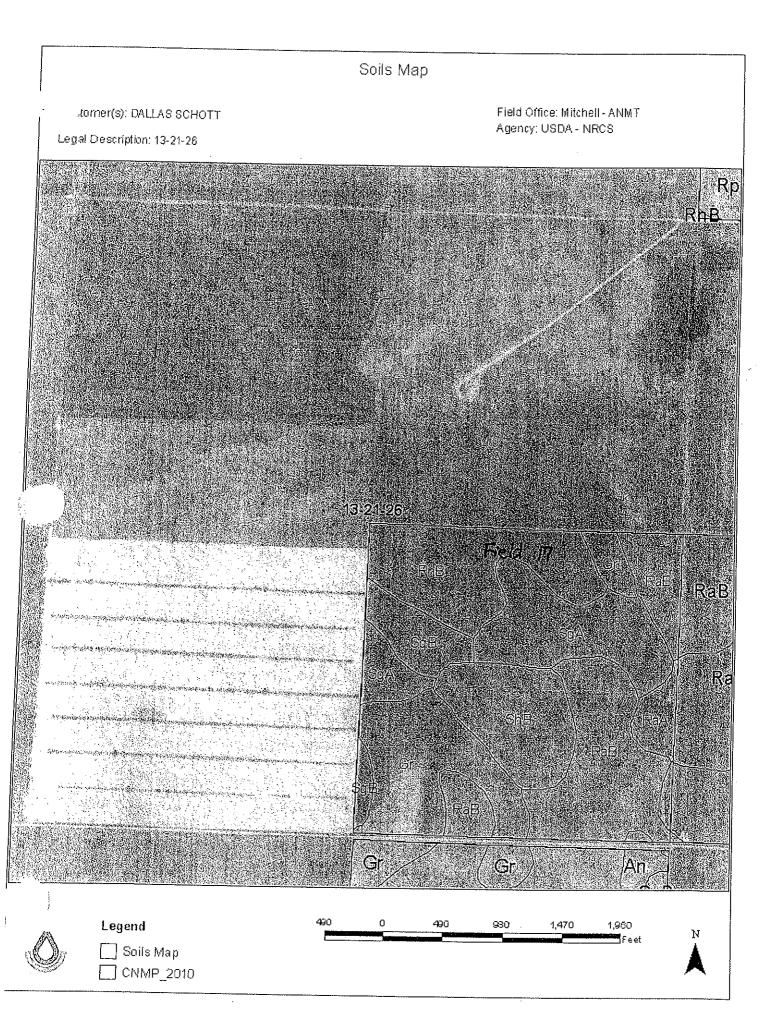
# **DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

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Customer(s): DALLAS SCHOTT

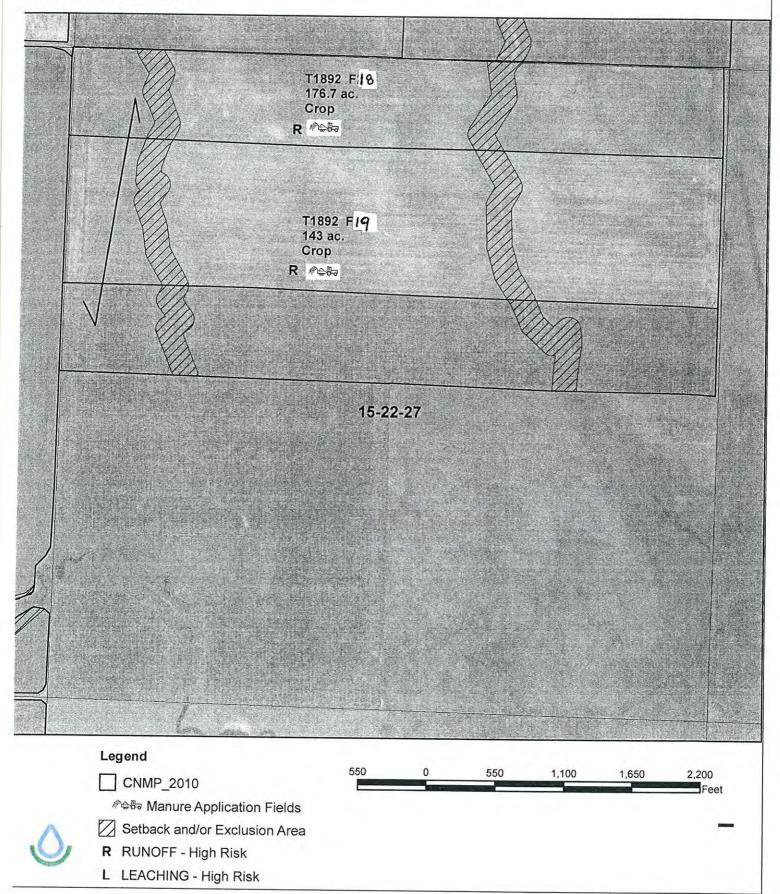
Legal Description: 13-21-26





Customer(s): DALLAS SCHOTT

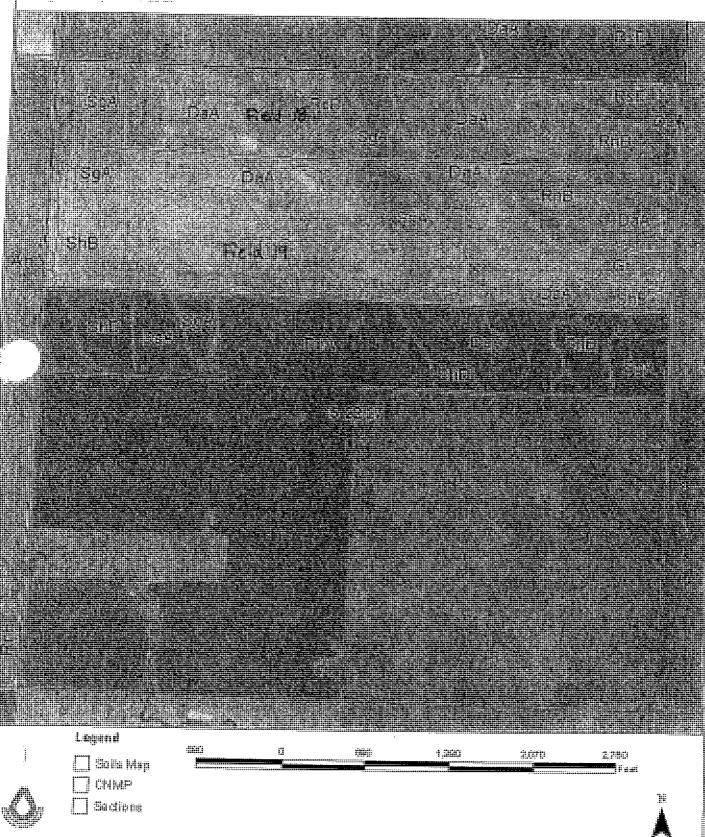
Legal Description: 15-22-27

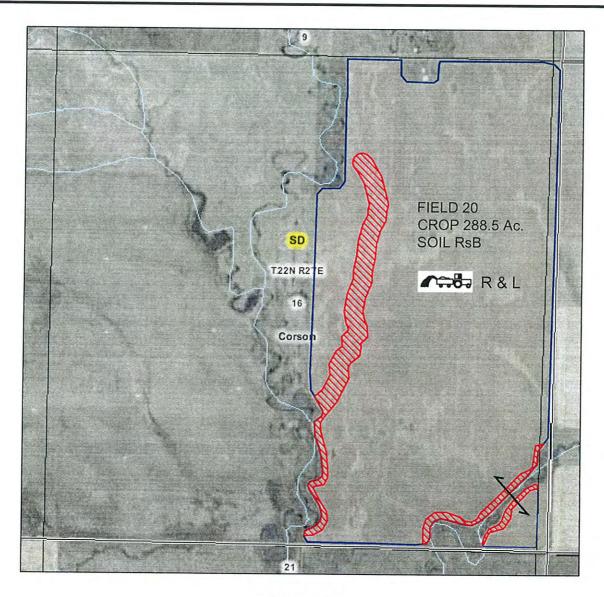


ADMINIST BALLAS ROMOTT

Legal Caracription: 15-3:3-3:7

Flord Officer Military - ANNET Agency: USCA - NECS





SCALE, FEET 0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

16 - 22N - 27E CORSON COUNTY, SD



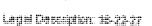
**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

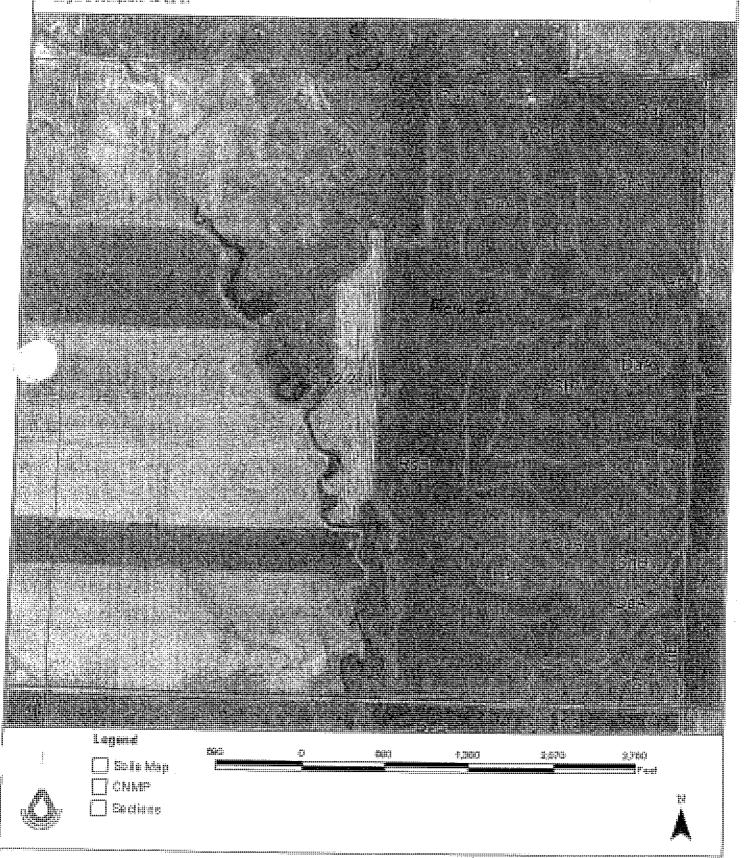
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Field Office: Michell - AAMT Agency: UEDA - MRCS



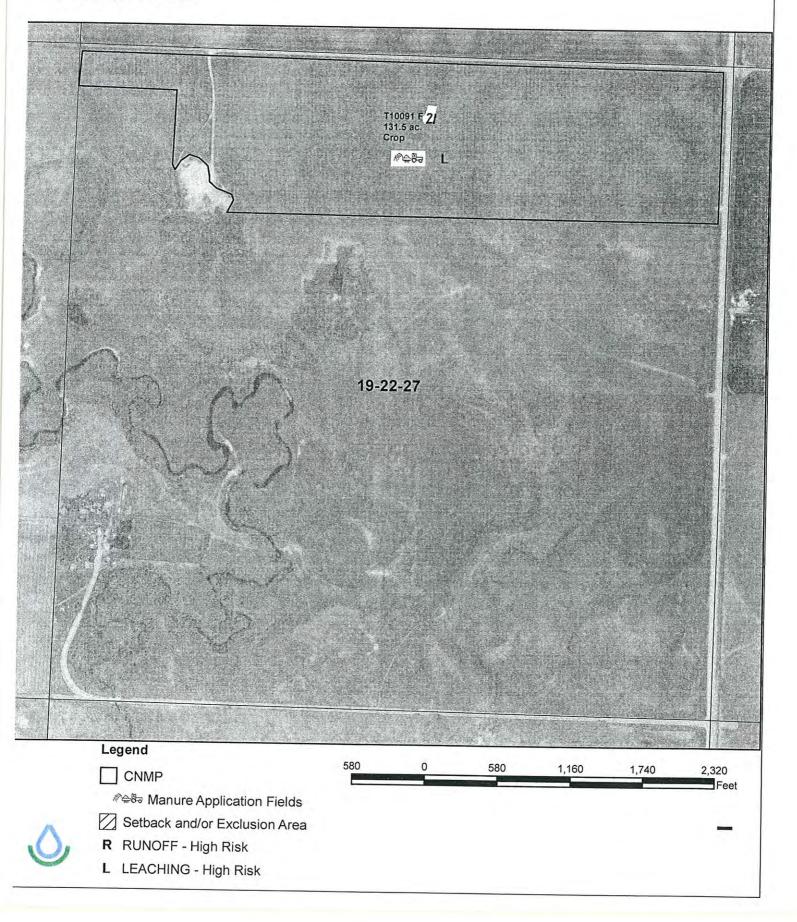


# Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 19-22-27

Field Office: Mitchell - ANMT Agency: USDA - NRCS

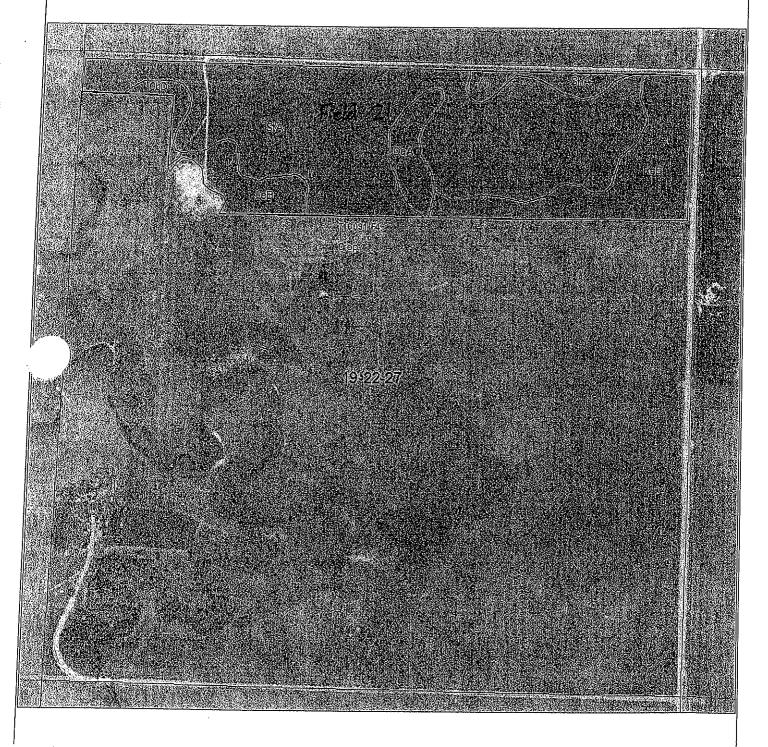


## Soils Map

stomer(s): DALLAS SCHOTT

Legal Description: 19-22-27

Field Office: Mitchell - ANMT Agency: USDA - NRCS





Legend

CNMP

Soils Map



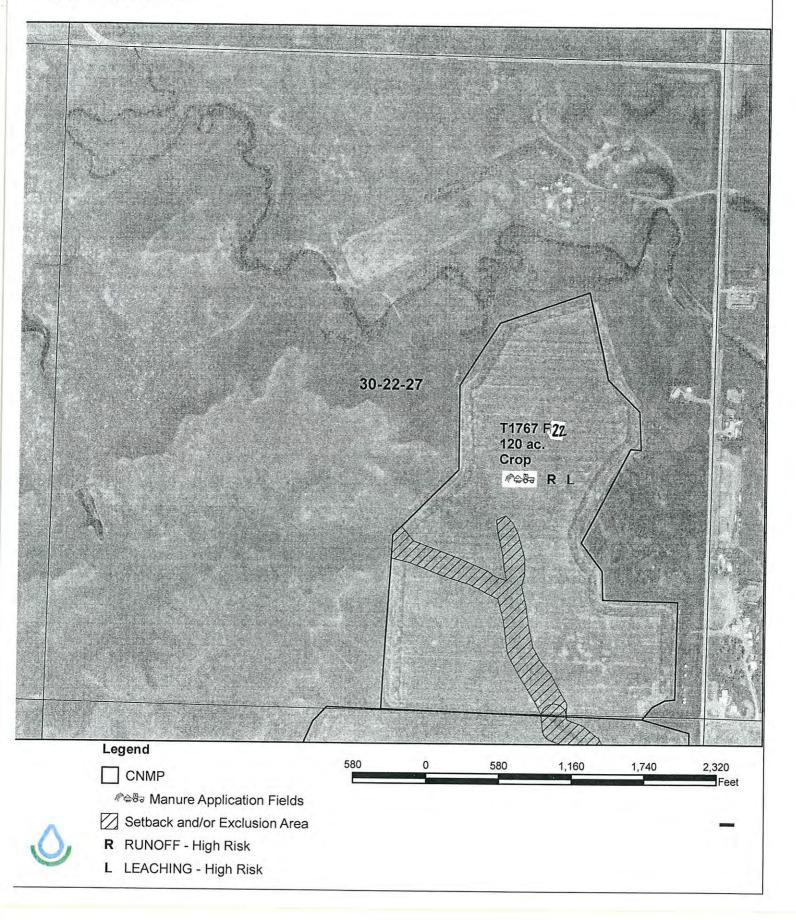


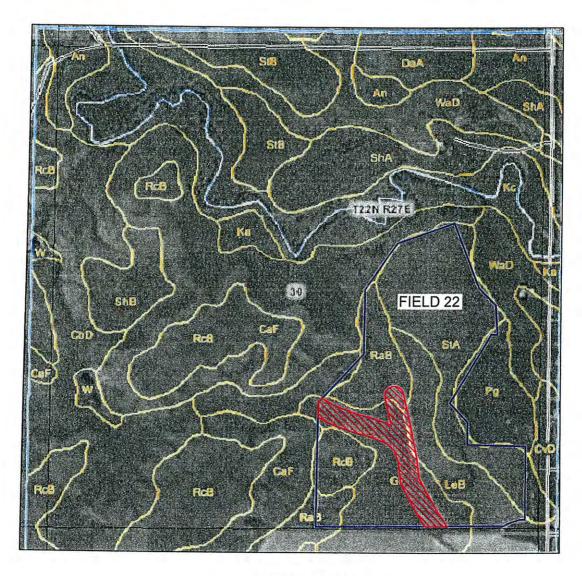
## Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 30-22-27

Field Office: Mitchell - ANMT Agency: USDA - NRCS





### Legend:

An Arnegard loam

CaF Cabba-Amor loams, 15 to 60 percent slopes

CbD Cabba-Reeder loams, 6 to 25 percent slopes

CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes

DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam

Ka Korchea loam

Kc Korchea loam, channeled

LeB Lehr loam, 2 to 6 percent slopes

Pg Pits, gravel

RaB Reeder loam, 2 to 6 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

RsB Rhoades-Daglum loams, 0 to 9 percent slopes

ShA Shambo loam, 0 to 2 percent slopes

ShB Shambo loam, 2 to 6 percent slopes StA Stady loam, 0 to 2 percent slopes

StB Stady loam, 2 to 6 percent slopes

WaD Wabek gravelly sandy loam, 2 to 35 percent slopes

#### SCALE, FEET 500 1000

1500 2000

# WULF CATTLE DEPOT SOILS MAP

Land Application Area

30 - 22N - 27E CORSON COUNTY, SD



# DeHaan, Grabs & Associates, LLC Consulting Engineers

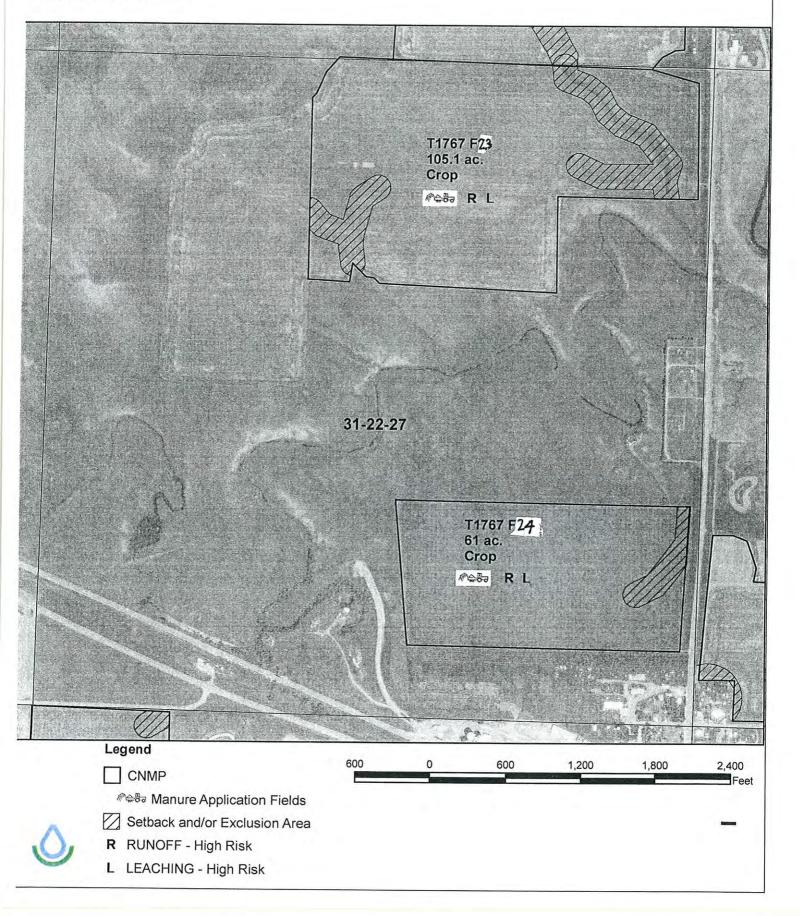
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## Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 31-22-27

Field Office: Mitchell - ANMT Agency: USDA - NRCS



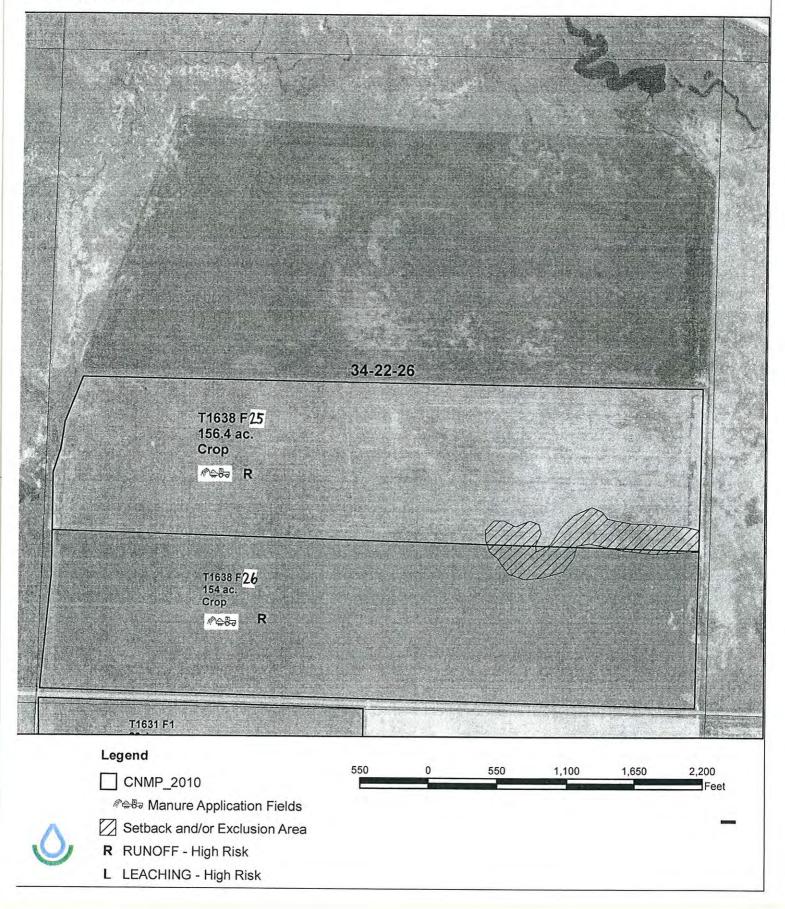
Solls Map Field Office: Mitchell - AbiMT ADMINISTRAÇÃO DE ACIDADO DE CARROLLO DE COMPONIO DE CO Agemey: USCLA - MAGE Logar Caracipations 31-33-37 Lugand 1,200 1,4450 I.E.O Childri 

## Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 34-22-26

Field Office: Mitchell - ANMT Agency: USDA - NRCS



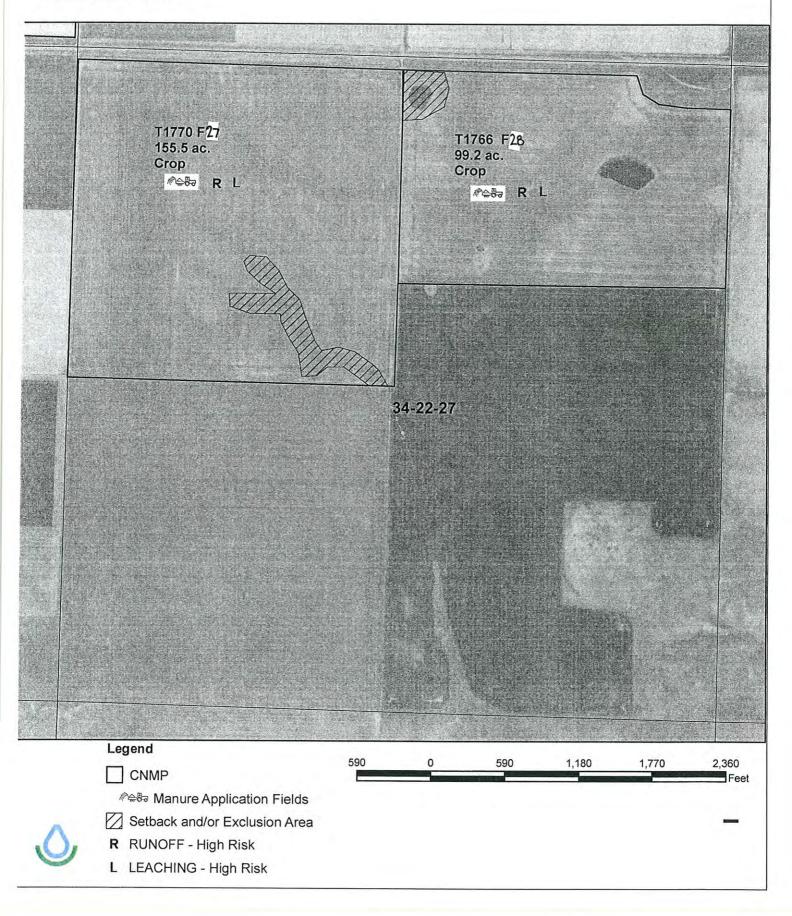
Soils Map Finis Ciffice: Mitchell - AUAMT Annents: CALLAS BELIGHT Agency: UECH - HACE Legal Conception 34-32-39 Legand CHIMP T Sactions

## Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 34-22-27

Field Office: Mitchell - ANMT Agency: USDA - NRCS





#### Legend:

An Arnegard loam

CbD Cabba-Reeder loams, 6 to 25 percent slopes

FrF Flasher-Rock outcrop complex, 30 to 60 percent slopes FtF Flasher-Telfer complex, 15 to 40 percent slopes

Gr Grail silty clay loam

Hs Heil silt loam

RaB Reeder loam, 2 to 6 percent slopes RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

SgB Savage silt loam, 3 to 6 percent slopes

ShA Shambo loam, 0 to 2 percent slopes

ShB Shambo loam, 2 to 6 percent slopes ShC Shambo loam, 6 to 9 percent slopes

TaA Tally fine sandy loam, 0 to 6 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

## Land Application Area

## WULF CATTLE DEPOT SOILS MAP

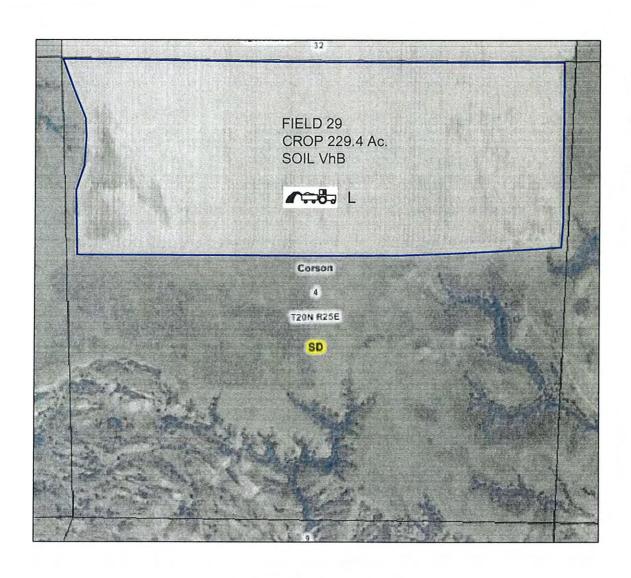
34 - 22N - 27E CORSON COUNTY, SD



# DeHaan, Grabs & Associates, LLC

Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
Checked By: GGG	Checked By:
Page:	Page:





Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

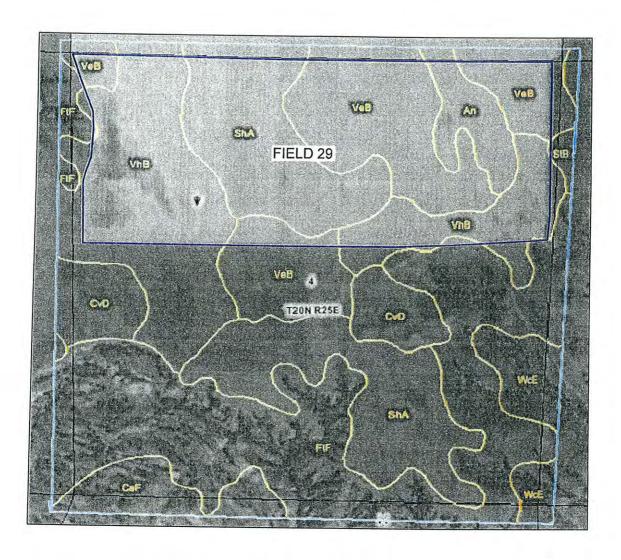
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

4 - 20N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

		Revision	
Date:	12/28/11	Date:	
Scale:	1" = 1000'	Scale:	
Drawn By:	CAS	Drawn By:	
Checked By:	GGG	Checked By:	
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### Legend:

An Arnegard loam

CaF Cabba-Amor loams, 15 to 60 percent slopes
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
FF Flasher-Telfer complex, 15 to 40 percent slopes

ShA Shambo loam, 0 to 2 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
StB Stady loam, 2 to 6 percent slopes
VeA Vebar fine sandy loam, 0 to 2 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

WcE Wayden-Cabba complex, 9 to 40 percent slopes

# Land Application Area

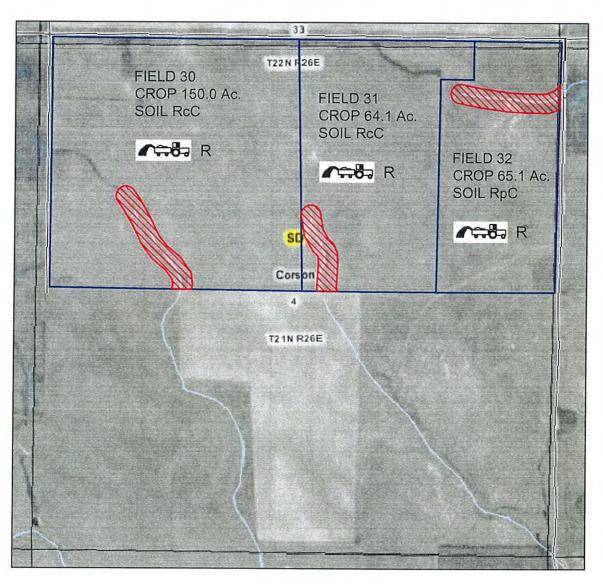
# WULF CATTLE DEPOT SOILS MAP

4 - 20N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision	
Date: 12/28/11	Date:	
Scale: 1" = 1000'	Scale:	
Drawn By: CAS	Drawn By:	
Checked By: GGG	Checked By:	
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

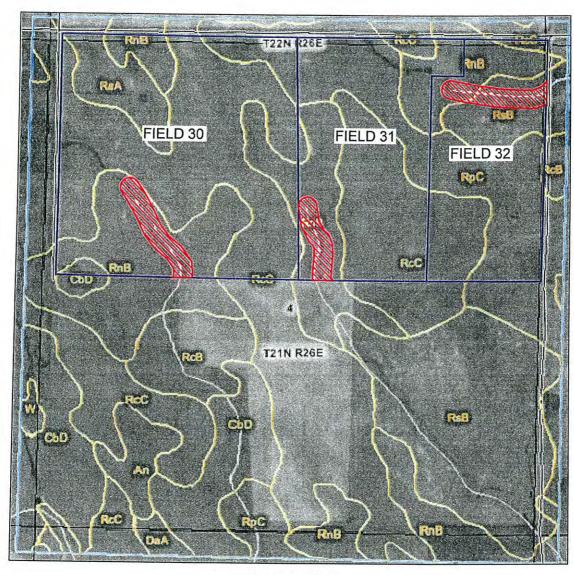
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

4 - 21N - 26E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

		Revision	
Date:	12/28/11	Date:	
Scale:	1" = 1000'	Scale:	
Drawn By:	CAS	Drawn By:	
Checked By:	GGG	Checked By:	
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## Legend:

An Arnegard loam

CaF Cabba-Amor loams, 15 to 60 percent slopes

CbD Cabba-Reeder loams, 6 to 25 percent slopes

DaA Daglum loam, 0 to 3 percent slopes

Hs Heil silt loam

RaA Reeder loam, 0 to 2 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes

RsB Rhoades-Daglum loams, 0 to 9 percent slopes

#### Land Application Area

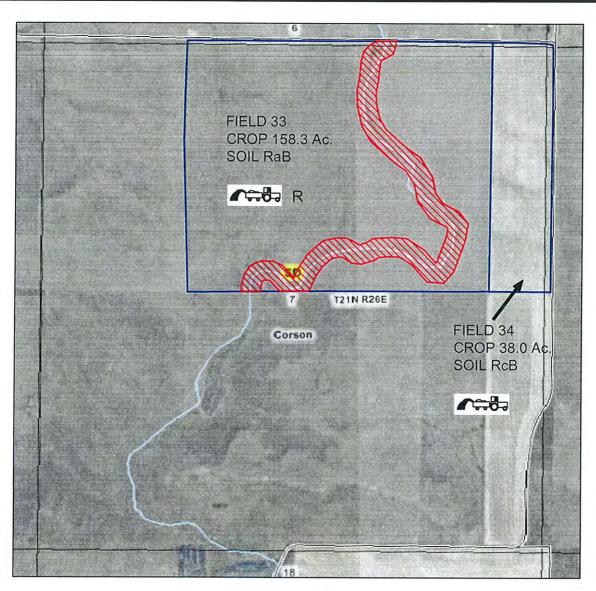
# WULF CATTLE DEPOT SOILS MAP

4 - 21N - 26E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

		Revision	
Date:	12/28/11	Date:	
Scale:	1" = 1000'	Scale:	
Drawn By:	CAS	Drawn By:	
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

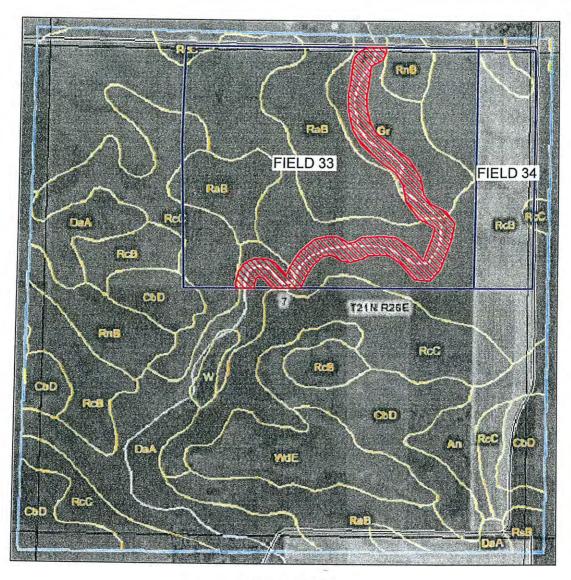
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

7 - 21N - 26E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
Checked By: GGG	Checked By:
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### Legend:

An Arnegard loam

CbD Cabba-Reeder loams, 6 to 25 percent slopes DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam

RaB Reeder loam, 2 to 6 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes

RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
WdE Wayden and Cabba soils, 6 to 40 percent slopes, extremely stony

## Land Application Area

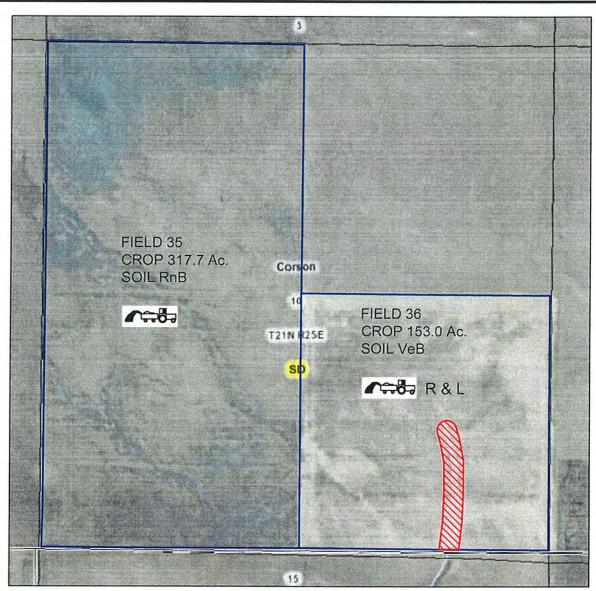
## WULF CATTLE DEPOT SOILS MAP

7 - 21N - 26E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	44 4 44 5	Revision	
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

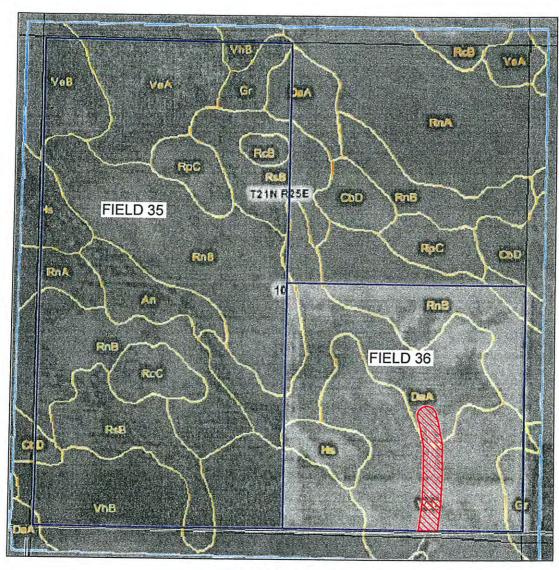
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

10 - 21N - 25E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
Checked By: GGG	Checked By:
Page:	Page:



## Legend:

An Arnegard loam

CbD Cabba-Reeder loams, 6 to 25 percent slopes

CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes

DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam

Hs Heil silt loam

RaB Reeder loam, 2 to 6 percent slopes

RaC Reeder loam, 6 to 9 percent slopes

RCB Reeder-Cabba loams, 3 to 6 percent slopes RCC Reeder-Cabba loams, 6 to 9 percent slopes

RnA Regent silty clay loam, 0 to 2 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes

RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes

RsB Rhoades-Daglum loams, 0 to 9 percent slopes 5

VeA Vebar fine sandy loam, 0 to 2 percent slopes 4 VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

### Land Application Area

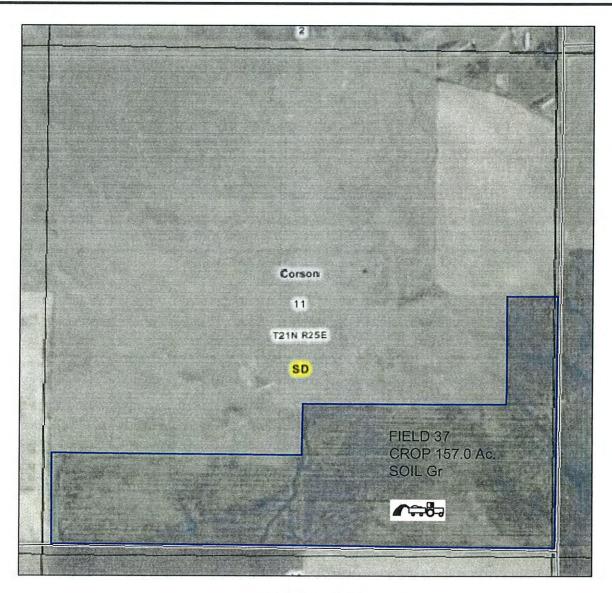
## WULF CATTLE DEPOT SOILS MAP

10 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

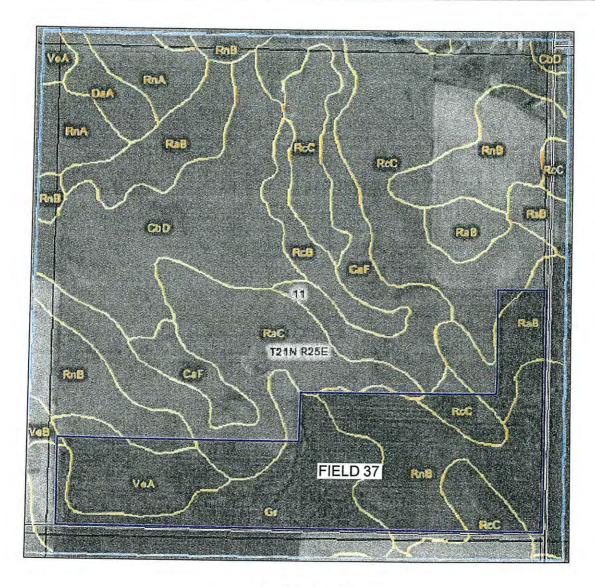
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

11 - 21N - 25E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

		Revision	
Date:	12/28/11	Date:	
Scale:	1" = 1000'	Scale:	
Drawn By:	CAS	Drawn By:	
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### Legend:

CaF Cabba-Amor loams, 15 to 60 percent slopes

CbD Cabba-Reeder loams, 6 to 25 percent slopes DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam

RaB Reeder loam, 2 to 6 percent slopes

RaC Reeder loam, 6 to 9 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnA Regent silty clay loam, 0 to 2 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes RsB Rhoades-Daglum loams, 0 to 9 percent slopes

VeA Vebar fine sandy loam, 0 to 2 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

## WULF CATTLE DEPOT SOILS MAP

11 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision
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Scale: 1" = 1000'	Scale:
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Checked By: GGG	Checked By:
Page:	Page:



Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

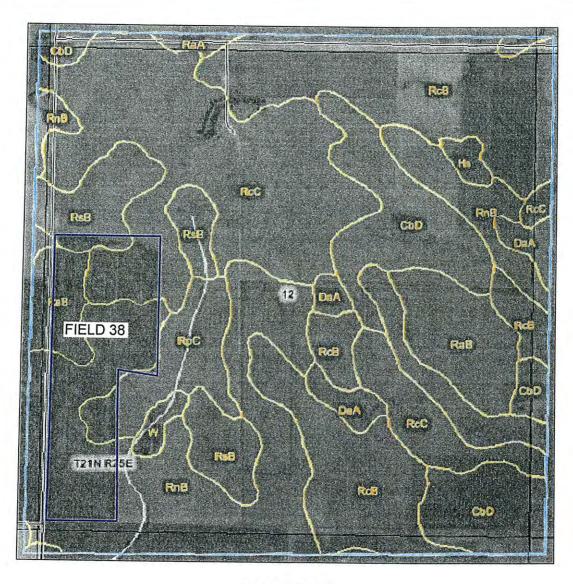
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

12 - 21N - 25E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

Date: 12/28/11	Revision		
	Date:		
Scale:	1" = 1000'	Scale:	
Drawn By:	CAS	Drawn By:	
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### Legend:

CbD Cabba-Reeder loams, 6 to 25 percent slopes

DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam

Hs Heil silt loam

RaA Reeder loam, 0 to 2 percent slopes RaB Reeder loam, 2 to 6 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnB Regent slity clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes

WdE Wayden and Cabba soils, 6 to 40 percent slopes, extremely stony

### Land Application Area

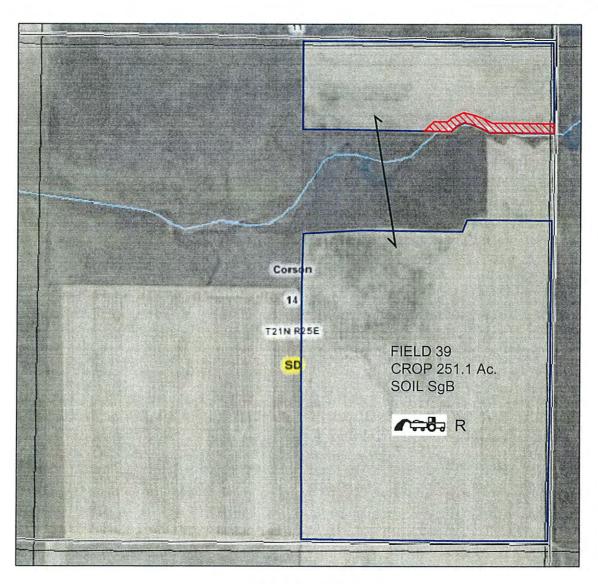
## WULF CATTLE DEPOT SOILS MAP

12 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

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Date: 12/28/11	Date:		
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

14 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
Checked By: GGG	Checked By:
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### Legend:

An Arnegard loam

CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam

RaB Reeder loam, 2 to 6 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes

RsB Rhoades-Daglum loams, 0 to 9 percent slopes

SgB Savage silt loam, 3 to 6 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

## Land Application Area

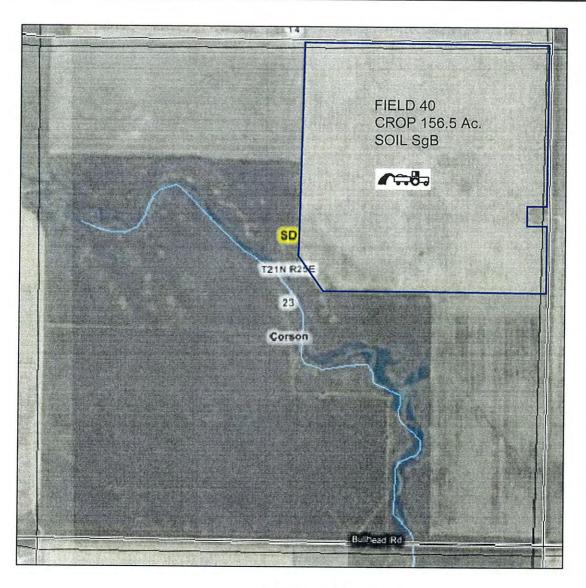
## WULF CATTLE DEPOT SOILS MAP

14 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision
Date: 12/28/11	'11 Date:
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Page:	Page:



Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

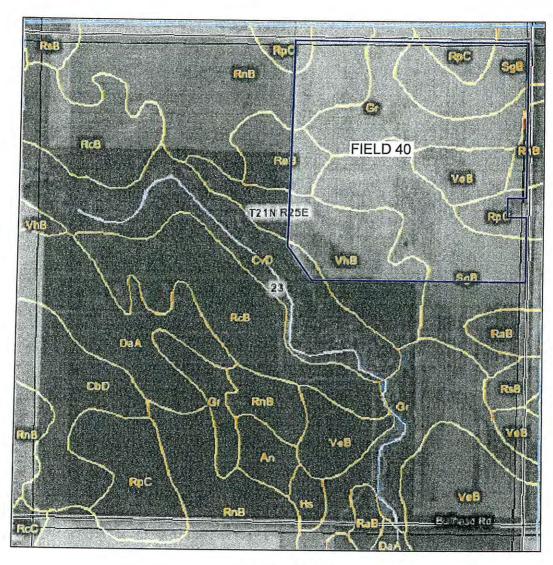
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

23 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
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#### Legend:

An Arnegard loam

CbD Cabba-Reeder loams, 6 to 25 percent slopes

CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes

DaA Daglum loam, 0 to 3 percent slopes Gr Grail silty clay loam

Hs Heil silt loam

RaB Reeder loam, 2 to 6 percent slopes

RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes

RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes RsB Rhoades-Daglum loams, 0 to 9 percent slopes

SgB Savage silt loam, 3 to 6 percent slopes

VeA Vebar fine sandy loam, 0 to 2 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

#### Land Application Area

## WULF CATTLE DEPOT SOILS MAP

23 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision
Date: 12/28/11	Date:
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

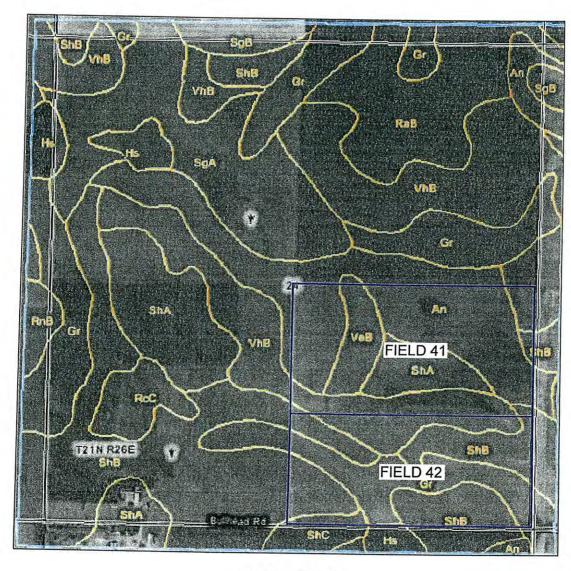
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

24 - 21N - 26E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

	Revision
Date: 12/28/11	11 Date:
Scale: 1" = 10	000' Scale:
Drawn By: CAS	Drawn By:
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#### Legend:

An Arnegard loam Gr Grail silty clay loam

Hs Heil silt loam

RaB Reeder loam, 2 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes SgA Savage silt loam, 0 to 3 percent slopes

SgB Savage silt loam, 3 to 6 percent slopes ShA Shambo loam, 0 to 2 percent slopes ShB Shambo loam, 2 to 6 percent slopes

ShC Shambo loam, 6 to 9 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

## Land Application Area

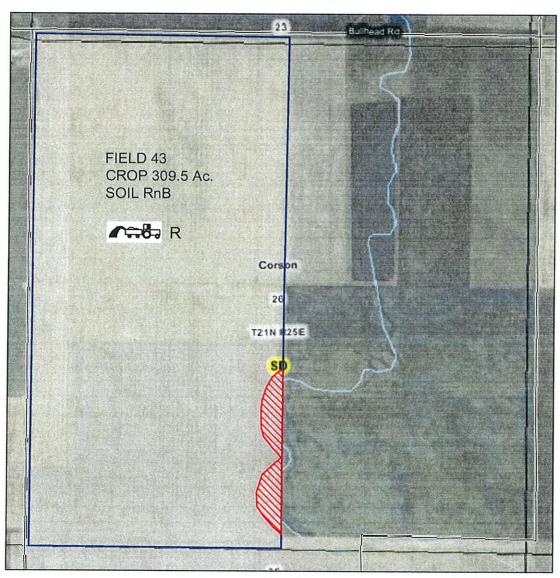
# WULF CATTLE DEPOT SOILS MAP

24 - 21N - 26E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

LEACHING - High Risk

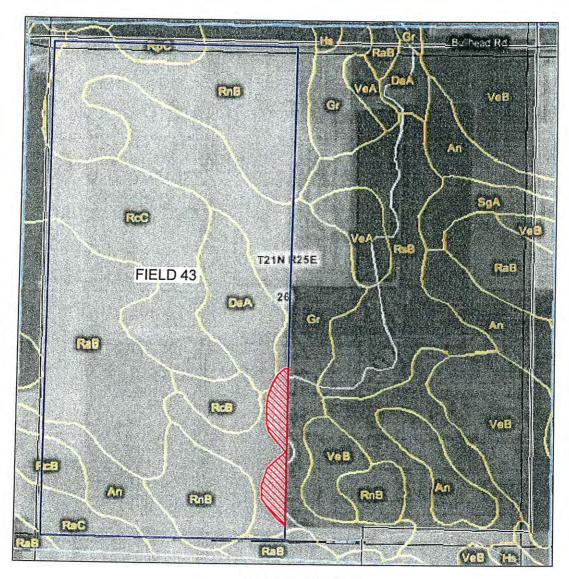
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

26 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
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### Legend:

An Arnegard loam

CbD Cabba-Reeder loams, 6 to 25 percent slopes

DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam

Hg Havrelon loam, channeled

Hs Heil silt loam

RaB Reeder loam, 2 to 6 percent slopes

RaC Reeder loam, 6 to 9 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes

RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
SgA Savage silt loam, 0 to 3 percent slopes

VeA Vebar fine sandy loam, 0 to 2 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

Land Application Area

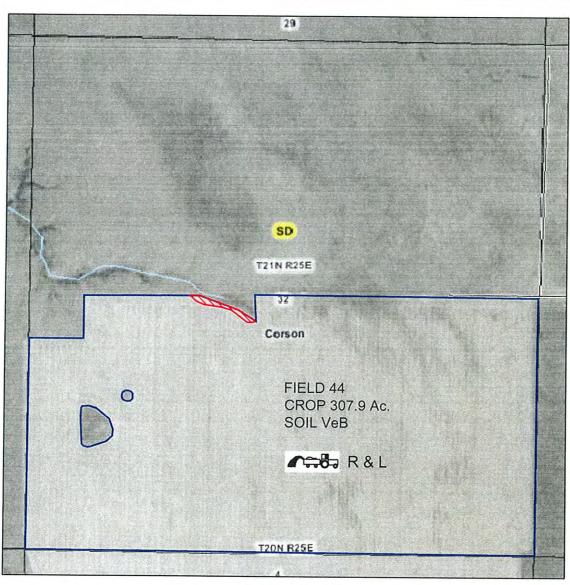
## WULF CATTLE DEPOT SOILS MAP

26 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision	
Date: 12/28/11	Date:	
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

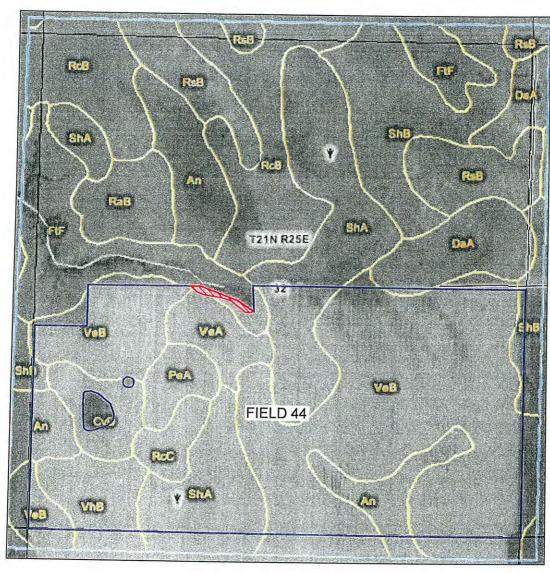
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

32 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
Checked By: GGG	Checked By:
Page:	Page:



### Legend:

An Arnegard loam

CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes

DaA Daglum loam, 0 to 3 percent slopes

FtF Flasher-Telfer complex, 15 to 40 percent slopes

PeA Parshall fine sandy loam, 0 to 6 percent slopes

RaB Reeder loam, 2 to 6 percent slopes

RCB Reeder-Cabba loams, 3 to 6 percent slopes RCC Reeder-Cabba loams, 6 to 9 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes RsB Rhoades-Daglum loams, 0 to 9 percent slopes

ShA Shambo loam, 0 to 2 percent slopes ShB Shambo loam, 2 to 6 percent slopes

VeA Vebar fine sandy loam, 0 to 2 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

## Land Application Area

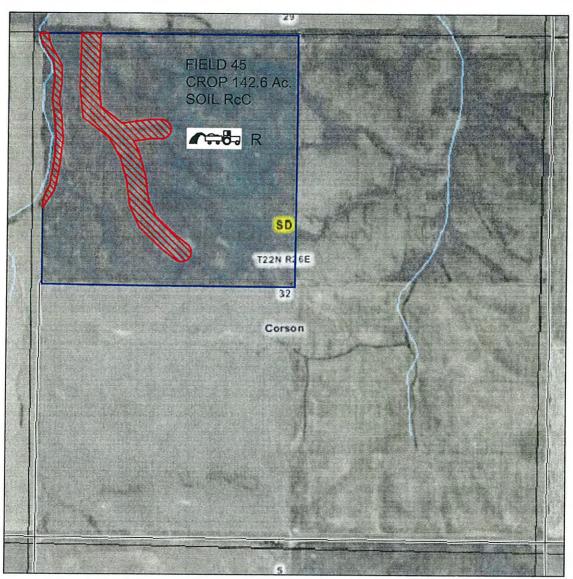
# WULF CATTLE DEPOT SOILS MAP

32 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

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Date: 12/28/11	Date:	
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

LEACHING - High Risk

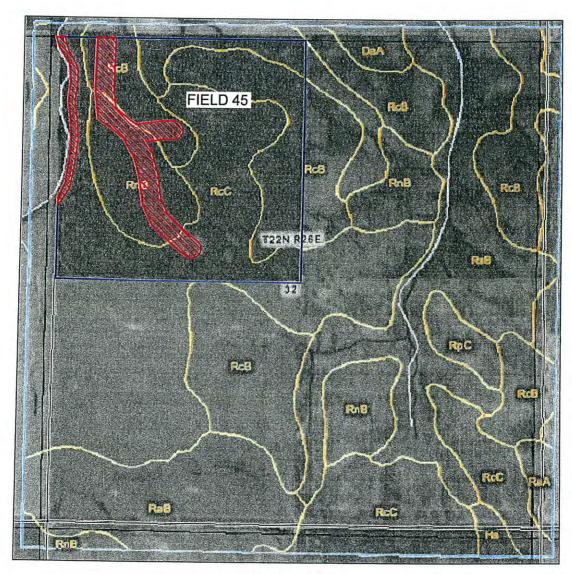
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

32 - 22N - 26E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
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### Legend:

CbD Cabba-Reeder loams, 6 to 25 percent slopes DaA Daglum loam, 0 to 3 percent slopes

Hs Heil silt loam

RaA Reeder loam, 0 to 2 percent slopes
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes

RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

## WULF CATTLE DEPOT SOILS MAP

32 - 22N - 26E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

		Revision	
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Drawn By:	CAS	Drawn By:	
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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

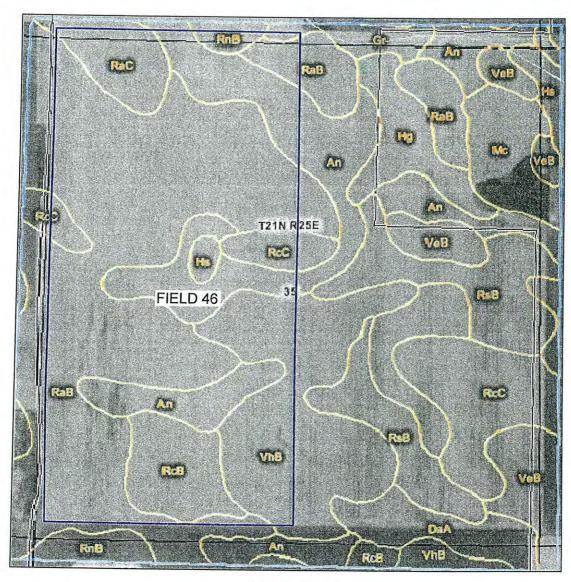
# WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

35 - 21N - 25E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

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### SCALE, FEET 1000 500 1500 2000

### Legend:

An Arnegard loam

DaA Daglum loam, 0 to 3 percent slopes

Gr Grail silty clay loam Hg Havrelon loam, channeled

Hs Heil silt loam

Mc McKenzie clay

RaB Reeder loam, 2 to 6 percent slopes
RaC Reeder loam, 6 to 9 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes

RnB Regent silty clay loam, 2 to 6 percent slopes

RsB Rhoades-Daglum loams, 0 to 9 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

### WULF CATTLE DEPOT SOILS MAP

35 - 21N - 25E CORSON COUNTY, SD



DeHaan, Grabs & Associates, LLC Consulting Engineers

PO Box 522, Mandan, ND 58554 (701) 663-1116, FAX: (701) 667-1356

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SCALE, FEET
0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

▲ Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

### WULF CATTLE DEPOT WATER QUALITY RISK ASSESSMENT MAP

16 - 21N - 27E CORSON COUNTY, SD



**DeHaan, Grabs** & **Associates, LLC** Consulting Engineers

PO Box 522, Mandan, ND 58554 (701) 663-1116, FAX: (701) 667-1356

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SCALE, FEET 1000 1500 2000

### Legend:

Arnegard loam

CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes

FaB Farnuf loam, 2 to 6 percent slopes

Gr Grail silty clay loam

Hs Heil silt loam RaA

Reeder loam, 0 to 2 percent slopes RaB Reeder loam, 2 to 6 percent slopes

RcB

Reeder-Cabba loams, 3 to 6 percent slopes

RcC Reeder-Cabba loams, 6 to 9 percent slopes Shambo loam, 2 to 6 percent slopes

VeB Vebar fine sandy loam, 2 to 6 percent slopes

VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

### Land Application Area

### WULF CATTLE DEPOT SOILS MAP

16 - 21N - 27E CORSON COUNTY, SD



### DeHaan, Grabs & Associates, LLC

Consulting Engineers

PO Box 522, Mandan, ND 58554 (701) 663-1116, FAX: (701) 667-1356

	Revision
Date: 5/23/13	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
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Page:	Page:

Section G: Crop Yield Documentation

Corson County Crop Yields

add 10% to vield goals.	
Planning,	ò
Management	
For Nutrient	
Yields	
Crop	
County	
son (	

	I don frame county crop 1	(11121		7	TANT	ובענד זו	Junus	ement.	riann	ing, a	I william Munagement Flanning, add 10% to vield goals.	o to vi	eld ooa	S	
Map	SoilDescrintion	Prod	Corn-	- Grain	Corn Si	Silage	-						, [		
		Index	ra	111	Dry	1	beans S	Sorghum .	Spring Wheat	Winter Wheat	Oats	Barley	Sun	Hαy'	Alfalfa
	Crop yields based on 2005 - 09 South Dakota Agricultural S	Statistics:	89	134	,	15	18		7%	ä	4	20	Jones	ı,	,
	County Average Crop Soil Map Unit Productivity Index	57.3				_			2	}	?		aca'ı	C')	7.3
An	ARNEGA	94	111	220	11	24	<u>ج</u>	22	5	0					
8		-	-	2	: 0	; c	3 0	75	¥ 0	20.0	٦,	20	2,716	2.4	2.2
8	BANKS FINE SAND	25	30	28	, «	-	ο α	- 5	2 5	-	- ;	-	23	0.0	0.0
BeA	BELFIELD-DAGLUM COMPLEX, 0 TO 3 PERCENT SLOPES	62	2	145	> ^	_	0 5	± 6	- 6	9 8	24	13	722	0.6	9.0
BfA		3 8	130	247	-   -	_	3 8	40 2	87 ;	£ 5	09	33	1,791	1.6	1.4
8		3 8	5 5	1 200	- 5	-	6 6	!	41	58	6	22	2,687	2.4	2.1
BgB		3 6	2 2	104	2 0	+	7 2	74	88	25	83	46	2,485	2.2	2.0
BgC	T	- 10	- C	3 [	מ	7 ;	47	42	34	48	74	41	2,225	2.0	1.8
, M		٥ د	2	)ç[	xo ·	-	21	37	တ္ထ	42	65	36	1,936	1.7	7.5
BmA	1	0 1	n 0	5 4	-	2 0	e (	4	4	2	ω	4	231	0.2	0.2
Ang.		.		2	-		2	4	က	4	^	4	202	0.2	0.2
B.B		2 8	77	23	<b>-</b>	ო .	<sub>د</sub>	9	4	9	10	5	289	0.3	0.2
9,0	1	2	24	47	2	2	9	11	6	13	19	77	578	0.5	0.5
3 8	1	18	24	42	2	2	9	9	8	£	17	0,	520	0.5	0.4
3 4		ω	တ	19	-	2	3	4	4	ည	æ	4	231	0.2	0.2
2 6		ည	9	12	<b></b>	7-	2	က	2	8	5	က	4	0.1	0.1
979		13	23	4	2	5	9	5	<b>∞</b>	12	18	10	549	0.5	0.4
	- i "	17	20	40	2	4	5	တ	80	11	16	o	491	0.4	0.4
3 6		22	56	51	3	9		12	5	14	21	12	636	9.0	0.5
3		13	15	30	2	3	4	~	9	80	13	7	376	0.3	6.0
P (	COHAGEN-CABBA-ROCK OUTCROP COMPLEX, 6 TO 70 PERCENT SLOPES	7	8	16	-	2	2	4	3	4	7	4	202	0.2	0.2
Q S	COHAGEN-VEBAR FINE SANDY LOAMS, 6 TO 25 PERCENT SLOPES	24	28	56	3		ထ	13	11	15	23	13	693	0.6	0.6
Pay Day	DAGLUM LOAM, 0 TO 3 PERCENT SLOPES	39	46	91		10	12	21	17	24	38	21	1,127	1.0	0.9
3	DUPREE-ROCK OUTCROP COMPLEX, 6 TO 30 PERCENT SLOPES	4	5	6	0	<b>*</b>	1	7	2	က	4	2	116	0.1	0.1
EKA F	EKALAKA VERY FINE SANDY LOAM, 0 TO 6 PERCENT SLOPES	31	37	72	4	8	10	17	14	19	30	17	968	0.8	0.7
ED 1	EKALAKA-PARSHALL COMPLEX, 0 TO 6 PERCENT SLOPES	36	£3	28	4	°	11	20	16	23	35	19	1,040	6.0	8.0
EVB		27	32	83	3	7	တ	15	12	17	56	14	780	0.7	9.0
Ew8		20	24	47	2	ഹ	9	11	6	13	19	1	578	0.5	0.5
X A	EVRIDGE-PARCHIN FINE SANDY LOAMS, 0 TO 6 PERCENT SLOPES	26	31	61		_	8	14	12	16	25	14	751	0.7	9.6
FaA	FARNUF LOAM, 0 TO 2 PERCENT SLOPES	\$	9	196	10	22	26	46	37	53	81	45	2,427	2.2	1.9
FaB	FARNUF LOAM, 2 TO 6 PERCENT SLOPES	79	94	185			25	43	35	49	9/	42	2,282	2.0	9.
눈	FLASHER-ROCK OUTCROP COMPLEX, 30 TO 60 PERCENT SLOPES	2	7	5	0	1	1	۲-	-	-	2	-	58	0,1	0.0
분	FLASHER-TELFER COMPLEX, 15 TO 40 PERCENT SLOPES	2	9	12	-	_	2	3	2	က	2	က	144	0.1	0.1
Ģe	GLENROSS FINE SANDY LOAM	စ္တ	36	70	4		6	17	13	19	53	16	867	0.8	2.0
ಕ	GLENROSS-EKALAKA FINE SANDY LOAMS	33	39	77	4		10	18	15	21	32	18	953	6.0	8.0
ъ	GRAIL SILTY CLAY LOAM	92	109	215	11	24	29	51	41	58	88	49	2,658	2.4	2.1
SS	GRASSNA SILT LOAM	97	115	227	12	55	31	53	43	61	94	52	2,803	2.5	2.2
윈	HARRIET LOAM	7	80	16			2	4	က	4	7	4	202	0.2	0.2
፰	HAVRELON LOAM	22	87	171	თ	9	 8	40	33	46	7	39	2,109	6.	1.7

NAMESON LOANS CONTRIBUTION   NAME CONTRIBUTION CONTRIBU		Corson County Crop Yields	ields		Fo	r Nutr	ient /	Janae	romont	Dlanz	,	001 FF	• • • • • • • • • • • • • • • • • • • •		_	
Marked Deviation of Parker   Marked Deviation   M	Map Unit	Soilhes	Prod	Corn.	Grain	Corn Sii	,000	-	1	Lang -	ıng, a	701 m	o to yu	eta goa	ts.	
AMMERIAN LEANANCE LEANANCE LEANANCE LEANANCE LEANANCE LEANANCE LOAN OF CHANGE LEAN OF CHANGE L		TOTAL CONTRACT OF THE CONTRACT	Index		#	Dry	1		Grain Corghum		Vinter Wheat	Oats	Barley	Sun		Alfaïfa
MANNELLO MANILLO MAN	뫈 :	HAVRELON LOAM, CHANNELED	. 53	×	89	_			4					Juwers		
MANIES BLANCE AND EMPERENT SLOPES   Mail Color Manies BLANCE AND EMPERENT SLOPES   Mail Color Manies BLANCE AND EMPERENT SLOPES   Mail Color	듄	HAVRELON LOAM, TERRACE	76	6	178	, 0	. 0	D .	٥	2	9	28	15	838	0.7	0.7
HUMENS SALL COMPANDENCY SERVICIONES 10 1 2 2 2 4 2 5 6 7 7 5 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7	Η̈́	HAVRELON-RHOADES LOAMS, 0 TO 4 PERCENT SLOPES	64	82	1,12	2 4	2 0	+7 -4	747	*	48	73	41	2,196	2.0	8.
NAMESALINGEOUS TOWN TO PERCENTISIONES 10 10 10 10 10 10 10 10 10 10 10 10 10	완	HEIL SILT LOAM	15	3 4	2 46	2 6	2 .	٠ ر	77	72	31	47	56	1,416	1.3	7:
NUMERY REPORTS COMPLEX OF PERCENT SLOPES  15 15 15 15 15 15 15 15 15 15 15 15 15 1	HuB	HURLEY SILT LOAM, 0 TO 9 PERCENT SLOPES	5 5	5 5	3 5	7	4 (	2	ω	7	6	15	80	433	4.0	0.3
American Propriete Converted No. 2017   20	HWA		2 4	7 9	3 8	-   (	m .	9	9	4	9	10	5	289	0.3	0.2
Compact Load   Comp	Ļ	JANESBURG-REGENT-CABBA COMPLEX 9 TO 35 PERCENT SLODES	رد ا م	2 2	35	2 0	4 1	5	8	7	6	15	æ	433	4.0	0.3
Concretational, Channellead   Control of C	кa	KORCHEA LOAM	8 6	ر ا د	19	e		80	4	12	16	25	14	751	0.7	9.0
LEINT CLAY LOAN AT TO SEPECIAL SIGNES   A	8	KORCHEA LOAM, CHANNEI ED	2 8	28	171	6	-	23	40	33	46	7.1	39	2,109	1.9	1.7
CHING CHAIN, OTO 2 PERCENT SLOPES   2, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	Z.	LALIE SILTY CLAY I DAM	g 8	36	02	4	ω	6	17	13	19	29	16	867	0.8	0.7
Control of Control o	LeA	LEHRIOAM 0 TO 2 PERCENT STORES	23	27	22	$\dashv$		7	13	10	14	22	12	665	9.0	0.5
MANICATION CLAY   1972   197	leB	I FHR I DAM 2 TO 6 PERCENT SLODES	£ ;	51	9			14	24	19	27	42	23	1,242	1.1	1.0
MAISCELLAME CLANKITRE   COMPLICANCY STOS PERCENTIS LOPES   S	Ng	MACKENZIC CLASS	40	47	83			13	22	18	25	39	21	1.156	10	6.0
MANACHENARION SAME   MANACHENARIONES   MANACHE	3 14	MISOCI I ANTONIO MISTER	22	32	63	3	7	6	15	12	17	26	14	780	20	0.0
DAYL CLAY, TO BEPECKENT SLOPES   S6   61   11   11   11   11   11   1	3	WISCELLANEOUS VALER	0	0	0	_	0	0	0	0	0	0	0	_	00	000
OPALL-LUAY, S. TOS PERCENTISLOPES         48         57         11.2         6         12         15         6         2         3         46         57         11.2         6         12         21         3         46         57         17         6         17         3         17         3         17         19         25         0.0           OPAL-HURLEY COMPLEX, OTOS PERCENT SLOPES         33         46         51         6         17         12         21         17         26         31         17         36         17         17         36         17         17         36         17         17         18         17         17         18         17         18         17         18         17         17         18         17         17         17         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17         18         17	g S	OPAL CLAY, 2 TO 6 PERCENT SLOPES	56	99	131			18	31	25	35	72	30	1618	5 4	5 6
PARCHINE NICTORY, 2 TO 9 PRICEAN SLOPES   39   34   46   31   17   24   36   17   17   24   36   17   17   10   10   10   10   10   10	3 8	OPAL CLAY, 6 10 9 PERCEN   SLOPES	48	22	112			15	56	21	30	46	26	1.387	12	; <del>-</del>
Purpolarie Notice County   Purpolaries   Section   Sec	3 8	OPAL-DUPREE CLAYS, 2 10 9 PERCENT SLOPES	32	38	7.5	4		9	18	14	20	34	17	925	80	0.7
NATIONAL SANDLY CLANA, 8 TO 9 PERCENT SLOPES  12 3 5 5 7 9 15 17 12 18 17 17 17 18 18 19 15 17 18 18 19 17 18 19 17 18 19 18 18 19 19 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19		OPAL-HURLEY COMPLEX, 0 TO 9 PERCENT SLOPES	39	46	16.		_	12	21	17	24	38	24	1 127	2 -	. 0
PARCHIN FINE SANDY LOAM, 0 TO 9 PERCENT SLOPES  10 12 23 1 3 6 15 15 16 17 18 17 18 17 18 18 17 18 18 17 18 18 18 19 18 18 18 18 19 18 18 18 18 18 18 18 18 18 18 18 18 18	၁၈၀	OPAL-SANSARC CLAYS, 6 TO 15 PERCENT SLOPES	27	32	63	ო		6	15	12	17	26	14	780	2 0	3 6
PARKPHINBULLOOK-CABBA COMPLEX, 6 TO 30 PERCENT SLOPES         10         12         23         1         3         6         4         6         10         5         289         0.3           PARKSHALI BOLLOOK-CABBA COMPLEX, 6 TO 30 PERCENT SLOPES         61         72         143         7         16         19         34         27         38         59         33         1,762         16           PARKSHALI FIRE SANDY LOAM, 0 TO 2 PERCENT SLOPES         7         16         18         7         16         19         34         27         38         59         33         1,762         16           PROMISE CLAY, 2 TO 6 PERCENT SLOPES         64         76         160         8         16         20         35         29         40         62         34         18           REEDER LOAM, 2 TO 6 PERCENT SLOPES         64         76         160         8         16         20         35         29         40         62         34         18           REEDER LOAM, 2 TO 6 PERCENT SLOPES         64         76         160         8         16         20         35         26         46         76         17         46         17         4         4         4         4 <td>PaB</td> <td>PARCHIN FINE SANDY LOAM, 0 TO 9 PERCENT SLOPES</td> <td>28</td> <td>33</td> <td>65</td> <td>3</td> <td>7</td> <td>6</td> <td>15</td> <td>12</td> <td>18</td> <td>27</td> <td>15</td> <td>800</td> <td>. 0</td> <td>0 0</td>	PaB	PARCHIN FINE SANDY LOAM, 0 TO 9 PERCENT SLOPES	28	33	65	3	7	6	15	12	18	27	15	800	. 0	0 0
PARSHALL FINE SANDY LOAM, OTO & PERCENT SLOPES  PHIS, GRALL FINE SANDY LOAM, OTO & PERCENT SLOPES  PHIS, GRALL FINE SANDY LOAM, OTO & PERCENT SLOPES  PROMISE CLAY, 2TO & PERCENT SLOPES  PREDER LOAM, OTO 2 PERCENT SLOPES  PREDER LOAM, OTO 2 PERCENT SLOPES  PREDER CABBA LOAMS, 3TO & PERCENT SLOPES  PROMISE CLAY, 3TO & PERCENT SLOPES  PROMISE SLICKSPOTS COMPLEX, 0TO 9 PERCENT SLOPES  PROMISE CLAY, 3TO & PERCENT SLOPES  PROMISE SLICKSPOTS COMPLEX, 0TO 9 PERCENT SLOPES  PROMISE SLICKSPOTS ACCOUNT SLOPES  PROMISE CLAY, 3TO & PERCENT SLOPES  PROMISE CLAY, 3TO & STATEM SLOPES  PROMISE CLAY, 3TO & STATEM SLOPES  PROMISE	8	PARCHIN-BULLOCK-CABBA COMPLEX, 6 TO 30 PERCENT SLOPES	10	12	23	-		3	9	4	· ·	1 6	) u	280		
PITS, CRAVEL.  PROMISE CLAY, OTO 2 PERCENT SLOPES  PROMISE CLAY, OTO 2 PERCENT SLOPES  PROMISE CLAY, OTO 2 PERCENT SLOPES  REDDER LOAM, OTO 2 PERCENT SLOPES  REDDER LOAM, OTO 2 PERCENT SLOPES  REDDER LOAM, OTO 2 PERCENT SLOPES  REDDER CAMBA, 2 TO 8 PERCENT SLOPES  REDDER CAMBA, 3 TO 8 PERCENT SLOPES  REDDER CAMBA, 2 TO 8 PERCENT SLOPES  REDDER CAMBA, 3 TO 8 PERCENT SLOPES  REDDE	PeA	PARSHALL FINE SANDY LOAM, 0 TO 6 PERCENT SLOPES	61	72	143	-	-	19	34	27	, 8	2 2	2 22	507	2 7 0 0	7.0
PROMISE CLAY, 1 TO 2 PERCENT SLOPES         72         85         168         9         18         23         40         32         45         7         7         85         169         18         23         40         32         45         7         7         19         18         18         23         40         62         34         18         19         18         18         20         35         40         62         34         18         18         18         18         18         18         18         18         18         18         18         18         18         18         40         62         34         18         18         40         82         40         62         34         18         18         18         30         20         22         40         62         34         18         32         17         32         40         82         40         82         40         82         40         82         40         82         40         82         42         13         41         13         41         42         228         22         42         228         82         13         14         14	Pg	PITS, GRAVEL	-	-	2	$\vdash$	-	0	-		3 -	3 -	3 +	201,1	0.0	4 6
PROMISE CLAY, 2 TO 6 PERCENT SLOPES         64         76         150         8         16         20         35         29         40         62         34         1,89         1         1         1         1         1         1         1         1         1         1         1         2         26         46         37         34         1,89         1         3         2         2         46         37         34         4,89         2         2         4         46         37         34         4,89         2         2         4         46         37         38         8         1         4         2         2         4         4         7         4         4         7         4         4         7         4         4         7         4         4         5         2         4         4         6         2         4         4         6         7         4         4         5         4         6         7         4         6         7         1         4         6         2         2         2         4         6         7         1         4         6         1         4	PrA	PROMISE CLAY, 0 TO 2 PERCENT SLOPES	72	85	168	<del> </del>	<del> </del>	33	40	32	45		. œ	080 6	2 6	5.6
REEDER LOAM, OTO 2 PERCENT SLOPES         84         100         196         10         22         26         46         37         53         81         47         170         22         25         43         35         49         76         42         26         26         43         35         49         76         42         27         22         20           REEDER LOAM, 2 TO 6 PERCENT SLOPES         60         71         140         7         15         19         33         27         38         68         32         1,734         1.5           REEDER-CABBA LOAMS, 3 TO 6 PERCENT SLOPES         64         76         15         8         16         20         35         29         40         62         34         1.6         1.7         1.7         1.7         1.0         35         29         40         62         34         1.6         1.7         1.0         1.0         20         35         40         1.6         1.7         1.0         1.0         1.0         20         35         40         1.6         1.7         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0	PrB	PROMISE CLAY, 2 TO 6 PERCENT SLOPES	64	76	150		ļ	g	35	73	40	2 69	3 2	1 849	<u>5</u> 4	- L
REEDER LOAM, 2 TO 6 PERCENT SLOPES         79         94         185         9         25         43         35         49         76         43         35         49         76         40         25         43         35         49         76         40         25         43         35         27         38         68         32         1,734         1.5           REEDER CABBA LOAMS, 3 TO 6 PERCENT SLOPES         64         76         150         8         16         20         36         40         62         34         1,84         1.5         1.5           REEDER-CABBA LOAMS, 6 TO 9 PERCENT SLOPES         50         17         16         13         16         20         36         21         30         46         26         1.3         16         20         36         41         48         17         20         36         21         30         46         26         1.3         16         20         36         41         80         18         16         20         36         21         31         1.4         1.3         16         20         36         21         31         1.4         1.3         11         20         31         4	RaA	REEDER LOAM, 0 TO 2 PERCENT SLOPES	84	100	196			92	46	37	53	81	45	2.427	2.2	6.
REEDER LOAM, 6 TO 9 PERCENT SLOPES         64         76         71         140         7         15         19         33         27         38         58         32         1.734         1.5           REEDER-CABBA LOAMS, 3 TO 6 PERCENT SLOPES         64         76         150         8         16         20         35         29         40         62         34         1.849         1.6           REEDER-CABBA LOAMS, 5 TO 9 PERCENT SLOPES         50         17         6         12         15         26         21         30         46         26         1.34         1.6           REDER-RHOADES LOAMS, 2 TO 9 PERCENT SLOPES         48         57         112         6         12         15         26         21         30         46         26         1.7         1.4         1.0         1.0         20         31         48         1.7         1.0         1.0         30         46         20         31         48         1.7         48         1.0         1.0         48         1.0         1.0         48         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.	Rag	REEDER LOAM, 2 TO 6 PERCENT SLOPES	79	94	185			55	43	35	49	76	42	2,282	2.0	1.8
REDER-CABBA LOAMS, 3 TO 6 PERCENT SLOPES         64         76         150         8         16         20         35         29         40         62         34         1,849         1,6           REEDER-CABBA LOAMS, 5 TO 9 PERCENT SLOPES         50         117         6         13         16         28         22         31         48         7         1445         13           REEDER-RHOADES LOAMS, 5 TO 9 PERCENT SLOPES         48         57         112         6         12         15         26         21         30         46         26         1387         12           REGENT SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES         60         71         140         7         15         19         33         27         38         68         17         14         11         11         19         16         22         34         15         17         16         19         11         19         16         22         34         15         17         16         18         11         10         11         10         11         11         11         11         11         11         11         11         11         11         11         11         11 <t< td=""><td>Rac</td><td>REEDER LOAM, 6 TO 9 PERCENT SLOPES</td><td>09</td><td>7.1</td><td>140</td><td></td><td></td><td>6</td><td>33</td><td>27</td><td>38</td><td>58</td><td>32</td><td>1,734</td><td>1.5</td><td>4.4</td></t<>	Rac	REEDER LOAM, 6 TO 9 PERCENT SLOPES	09	7.1	140			6	33	27	38	58	32	1,734	1.5	4.4
REEDER-CABBA LOAMS, 6 TO 9 PERCENT SLOPES         59         177         6         13         16         28         22         31         48         77         1445         17         6         13         16         28         22         31         48         57         112         6         12         15         26         21         30         46         26         17         16         15         26         21         30         46         26         17         16         17         20         36         41         6         17         20         36         41         6         17         20         36         41         6         17         10         36         41         6         17         10         36         41         10         11         40         11         40         11         40         11         40         11         40         11         40         11         40         11         40         11         40         11         40         11         40         11         40         11         40         11         40         11         40         11         40         40         40         40	KCB	REEDER-CABBA LOAMS, 3 TO 6 PERCENT SLOPES	2	92	150			20	35	53	40	62	×	1,849	1.6	1.5
REGENT SILTY CLAY LOAMS, 2 TO 9 PERCENT SLOPES         48         57         112         6         12         15         26         21         30         46         26         17         17         18         17         20         36         29         41         63         35         1,734         1.7           REGENT SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES         60         71         140         7         15         19         33         27         38         58         32         1,734         1.7           REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES         35         41         82         4         9         11         19         16         22         34         1,534         1,7         1           RHOADES LOAM, 0 TO 6 PERCENT SLOPES         22         41         23         4         7         4         7         5         8         12         3         4         1	ည္က	REEDER-CABBA LOAMS, 6 TO 9 PERCENT SLOPES	50	59	117			91	28	22	31	48	27	1,445	1.3	1.2
REGENT SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES         65         77         152         8         17         20         36         29         41         63         35         1,878         1.7           REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES         60         71         140         7         15         19         33         27         38         58         1,734         1.5           REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES         35         41         82         4         9         11         19         16         22         34         19         1,71         0.9           RHOADES LOAM, D O6 PERCENT SLOPES         22         26         51         3         4         7         5         8         12         6         34         10         1	2 2 3 3	REEDER-RHOADES LOAMS, 2 TO 9 PERCENT SLOPES	48	22	112			15	26	21	30	46	26	1,387	1.2	1.
REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES         60         71         140         7         15         19         33         27         38         58         1734         1.51           REGENT SILTY CLAY LOAMS, 6 TO 15 PERCENT SLOPES         35         41         82         4         9         11         19         16         22         34         19         17         16         17         19         16         17         10	RnA	REGENT SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES	65	77	152			Q.	36	23	41	63	35	1,878	1.7	1.5
REGENT-WAYDEN SILTY CLAY LOAMS, 6 TO 15 PERCENT SLOPES         36         41         82         4         9         11         19         16         22         34         19         101         19         16         22         34         19         11         19         16         22         34         17         3         4         7         5         8         12         6         34         0           RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES         20         24         47         2         5         6         11         9         13         14         17         6         6         6         7         12         14         1	RuB	REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES	8	71	140	7		6	33	27	38	58	32	1,734	1.5	1.4
RHOADES LOAM, 0 TO 6 PERCENT SLOPES         12         14         28         1         3         4         7         5         8         12         6         347         0.3           RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES         22         26         51         3         6         7         12         10         14         21         12         6.6         6.6         7         14         21         12         6.6         6.6         7         14         14         14         21         14	Sp.	REGENT-WAYDEN SILTY CLAY LOAMS, 6 TO 15 PERCENT SLOPES	35	41	82			Ξ	19	16	22	32	19	1,011	6.0	8.0
RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES         22         26         51         3         6         7         12         10         14         21         12         636         0.6           RHOADES-DAGLUM-SLICKSPOTS COMPLEX, 0 TO 8 PERCENT SLOPES         15         47         2         5         6         11         9         13         19         11         578         0.5           RHOADES-SLICKSPOTS COMPLEX, 0 TO 6 PERCENT SLOPES         15         18         3         8         7         9         15         8         433         0.4           RHOADES-SLICKSPOTS-ROCK OUTCROP COMPLEX, 0 TO 40 PERCENT SLOPES         6         7         14         1         2         2         3         4         6         3         173         0.2           ROCK OUTCROP-CABBA COMPLEX, 6 TO 40 PERCENT SLOPES         4         5         9         0         1         1         1         2         3         4         6         3         1 <td>RrA</td> <td>RHOADES LOAM, 0 TO 6 PERCENT SLOPES</td> <td>12</td> <td>4</td> <td>28</td> <td></td> <td></td> <td>4</td> <td>7</td> <td>5</td> <td>80</td> <td>12</td> <td>9</td> <td>347</td> <td>0.3</td> <td>0.3</td>	RrA	RHOADES LOAM, 0 TO 6 PERCENT SLOPES	12	4	28			4	7	5	80	12	9	347	0.3	0.3
RHOADES-DAGLUM-SLICKSPOTS COMPLEX, 0 TO 9 PERCENT SLOPES         24         47         2         5         6         11         9         13         19         11         578         0.5           RHOADES-SLICKSPOTS COMPLEX, 0 TO 6 PERCENT SLOPES         15         18         35         2         4         5         8         7         9         15         8         433         0.4           RHOADES-SLICKSPOTS-ROCK OUTCROP COMPLEX, 0 TO 40 PERCENT SLOPES         6         7         14         1         2         2         3         4         6         3         173         0.2           ROCK OUTCROP-CABBA COMPLEX, 6 TO 40 PERCENT SLOPES         4         5         9         0         1         1         1         2         2         3         4         6         3         173         0.2	RsB	RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES	22	26	51			7	12	10	14	21	12	929	9.0	0.5
RHOADES-SLICKSPOTS COMPLEX, 0 TO 6 PERCENT SLOPES         15         18         35         2         4         5         8         7         9         15         8         433         0.4           RHOADES-SLICKSPOTS-ROCK OUTCROP COMPLEX, 0 TO 40 PERCENT SLOPES         6         7         14         1         2         2         3         4         6         3         1/73         0.2           ROCK OUTCROP-CABBA COMPLEX, 6 TO 40 PERCENT SLOPES         4         5         9         0         1         1         2         2         3         4         2         116         0.1	EB.	RHOADES-DAGLUM-SLICKSPOTS COMPLEX, 0 TO 9 PERCENT SLOPES	20	24	47			9	11	6	13	19	11	578	0.5	0.5
RHOADES-SLICKSPOTS-ROCK OUTCROP COMPLEX, 0 TO 40 PERCENT SLOPE         6         7         14         1         2         2         3         4         6         3         173         0.2           ROCK OUTCROP-CABBA COMPLEX, 6 TO 40 PERCENT SLOPES         4         5         9         0         1         1         2         2         3         4         2         116         0.1	SuB I	RHOADES-SLICKSPOTS COMPLEX, 0 TO 6 PERCENT SLOPES	15	92	35			2	80	7	6	15	∞	433	0.4	0.3
ROCK OUTCROP-CABBA COMPLEX, 6 TO 40 PERCENT SLOPES         4         5         9         0         1         1         2         2         3         4         2         116         0.1	₽ P	RHOADES-SLICKSPOTS-ROCK OUTCROP COMPLEX, 0 TO 40 PERCENT SLOP	9	7	4.			2	3	3	4	9	3	173	0.2	0.1
	ਨ 구	ROCK OUTCROP-CABBA COMPLEX, 6 TO 40 PERCENT SLOPES	4	2	6	0		_	2	2		4	2	116	0.1	0.1

### For Nutrient Management Planning, add 10% to yield goals. Corson County Crop Yields

Man							0		and to help gones.	/ O T	: : :	מממ		
Unit	SoilDescription	Prod	Corn -	- Grain	Corn Silage	ge Soy-	p- Grain	Spring	Winter			3		
ا	_		$Dr_{J}$	In	Dry I	Irr bec	3	Wheat	Wheat	Oats	Barley	flowers	Haji	Alfalfa
N H		8	6	19	-	2	-	,						
SdD	SANSARC-OPAL-DUPREE CLAYS, 9 TO 25 PERCENT SLOPES	-	42	2 2	+	+	-	4	Ç	∞	4	231	0.2	0.2
SeF		- 4	<u>3</u> L	07 :	+	+		2	7	11	9	318	0.3	0.3
SgA		0 6	, ,	4 (	$\dashv$	-	-	3	4	9	3	173	0.2	0.1
SaB	1	8 8	5	55.	$\dashv$	-	7 47	38	53	82	45	2,456	2.2	2.0
S.PA	Т	⊋ .	32	187	$\dashv$	20 25	5 44	36	20	77	43	2,311	2.1	1.8
240		83	88	194	10 2	21 26	3 46	37	52	8	4	2.398	2.1	19
מוֹס	-	78	92	182	9 2	20 25	5 43	35	49	75	42	2.254	2.0	000
2 2		62	73	145	7 1	16 20	8	28	33	90	33	1.791	1.6	4
5	STADT LOAM, UTO 2 PERCENT SLOPES	55	65	129	7 1	14 17	30	25	8	53	29	1.589	14	13
S S		64	58	115	9	13 15	5 27	22	31	47	26	1 416	7	: -
Tay Ya		54	g	126	6	14 17	-	24	5 25	: 2	2 6	2 6		
₽	TELFER LOAMY SAND, 0 TO 6 PERCENT SLOPES	99	36	20	4	6		7	5 2	2 00	67	1,300 7.30	4.	7.1
Тев	TELFER-EKALAKA COMPLEX, 0 TO 6 PERCENT SLOPES	26	31	5	-	+	-	2 5	2 0	57	₽ :	200	2.0	).'
Ę	TREMBLES FINE SANDY LOAM	5	; \ \frac{1}{4}	5 5	+	+	-	7	۹	Ç	14	751	0.7	9.0
Ę	TREMBLES FINE SANDY I DAM CHANNELED	3 8	- G	3 ;		$\perp$		13	27	42	23	1,242	1.1	0.1
F	TREMBIES FINE SANDY LOAM TERRACE	75	ဂ္ဂ မ	0 3	$\dashv$	+	-	14	20	31	17	925	9.0	0.7
: 00/1		9	55	8	-	12 15	25	21	53	44	25	1,329	1.2	1.1
200		28	ස	136	7 15	5 18	32	26	36	56	31	1,676	1.5	1.3
g g	VEDAR FINE SANUT LUAM, Z 10 6 PERCENT SLOPES	51	90	119	6 13	3 16	28	23	32	49	27	1,473	1.3	1.2
VIIB	VEBAR-COHAGEN FINE SANDY LOAMS, 2 TO 9 PERCENT SLOPES	43	51	100	5 11	1 14	24	13	27	42	83	1,242	1.1	1.0
≥	- {	0	0	0	0	0	0	0	0	С	c	c	0.0	0
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WCE		œ	თ	19	1 2	3	4	4	5	000	4	234		
WdE	WAYDEN AND CABBA SOILS, 6 TO 40 PERCENT SLOPES, EXTREMELY STONY	9	7	14	1 2	2	3	8	4	) (C	۰ «	173	0.0	7 6
₹	WENDTE SILTY CLAY, CHANNELED	53	34	89	3 7	6	16	13	18	28	, <del>,</del>	828	2.0	
ZeB	ZEONA LOAMY FINE SAND, 0 TO 6 PERCENT SLOPES	28	33	65	3	-	15	12	18	27	5 5	808	0.7	0.6
Q\$Z	ZEONA-SLICKSPOTS-ROCK OUTCROP COMPLEX, 0 TO 30 PERCENT SLOPES	16	19	37	2 4	5	6	7	5	15	6	462	0.4	0.4

Section H: Signed Manure Application Lease Agreements

### MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made December 30, 2010, by and between Golden Hills, LLP (Land Owners hereinafter "Grantor") and Wulf Cattle Co., LLP (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

E1/2NW1/4 and NE1/4 Sec. 7 T21N R26E of Black Hills Meridian

SW1/4 Sec. 12 T21N R25E of Black Hills Meridian

W1/2 and SE1/4 Sec. 10 T21N R25E of Black Hills Meridian

S1/2 Sec. 11 T21N R25E of Black Hills Meridian

Field 38

S1/2 Sec. 11 T21N R25E of Black Hills Meridian

Field 35, 36

Field 37

Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian Section 5: All of that part of the S1/2NE1/4 Lving North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the NW1/4 of Section 5, Township 21 North, Range 27 East of Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition. Together with an easement of right of way on, over and across Tract 1 McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to haul and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such manure application and other related benefits.

WHEREAS, Grantor and Grantee have had mutual discussions with regard to entering into such an agreement and wish to reduce the agreement to writing.

**NOW, THEREFORE, in consideration of the premises and under the mutual covenants, promises and conditions set forth herein.**Grantor and Grantee hereby agree as follows:

- <u>Easement To Apply Livestock Bio-Solids:</u> Grantor hereby grants to Grantee an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- Term of Agreement: This Agreement and the easements connected herewith shall become effective on the date first
  above written and shall remain in effect for a period of 15 years unless terminated earlier by mutual agreement

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Page 1 of 3

between the parties.

- Application of Manure and Other Livestock Bio-solids: The parties hereto agree that Grantee shall be solely
  responsible for application of the manure and other livestock bio-solids to the Property, and the parties covenent and
  agree that:
  - A. Any and all application of manure and other livestock bio-solids shall be done in a good and husband like manner, taking into account weather conditions, soli conditions and time of year, all so as to reduce any odor that might emanate from such manure application.
  - B. That the application of manure and other livestock bio-solids shall be done in conformance with state rules and local county zoning ordinances and in accordance with all other applicable permits, statutes, rules and regulations relating to such acts and practices.
  - C. At all times during the term of this agreement, Grantee will, so far as reasonably practicable, honor all requests and directions made by Grantor with respect to the timing, location and manner of any application of manure and other livestock bio-solids to the soil, and such application shall in no event be done in any way that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantee's application of manure and other livestock bio-solids to the Property. In any calendar year, Grantee shall have the right to apply manure and other livestock bio-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at applicable agronomic rates,
  - D. Grantee is responsible for any claims, causes of action, demands or damages for property loss arising from or on account of its manure and other livestock bio-sollds application and egreas to fully indemnify and hold harmless Grantor of and from all such claims. Grantor waives any claims, causes of action, demands or damages for property loss if Grantee's application of manure and other livestock bio-sollds is equal to or less than the minimum quantity specified in C above. Any claim by Grantor for property loss will be limited to the valua of the crops growing on the Property allegedly damaged by Grantee's action. Grantee shall have no responsibility for any claims, causes of action, demands or damages for personal injury and Grantor waives any claims for personal injury.
  - E. Nothing in this agraement shall require Grantee to apply manure and other livestock bio-solids to the Property.
  - F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuals or entities an easement or right to apply manure and other livestock bio-solids to the Property. Other than this easement, Grantor has not granted any other individual or entity an easement or right to apply manure and other livestock bio-solids to the Property.
  - G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.
- Successors and Assigns: This Agreement shall inure to the benefit of and be binding upon heirs, successors and
  assigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this
  Agreement are fully assignable without the consent of Grantor.
- <u>Execution of Documents</u>: All parties agree to execute any and all additional documents that may be necessary to
  implement the full terms and conditions of this Agreement, including, but not limited to, eny additional state or county
  permit forms that may be required.
- <u>Termination [Optional]</u>: If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will
  exercise reasonable efforts to find replacement property to which Grantee may apply manure and other ilvestock biosolids. If replacement property is located and Grantee obtains a manure eesement with respect to the same, this
  Agreement will be terminated.
- Entire Agreement: The foregoing constitutes the entire agreement between the parties.
- Severability: If one provision of this Agreement is held invalid, that shall not affect any other provision of this
  Agreement.

IN WITNESS WHEREOF, this Agreement has been executed on the day and year first ebove written.

GRANTORS:  X	X June 1 Wulf, as Trustee of the Jeral L. and Linda L. Wulf Living Trust dated April 22, 2003, General Partner
X	Χ
X	Χ
GRANTEES:  X  Jerul L. Wulf, Operations Management Partner	X Dennis Wulf, Financial Matters Partner

AgC 8223c (12/2006) Source/Library/Forms/Credit-Forms Page 2 of 3

X	X
x	
ACKNOWLEDGEMENTS	
STATE OF	•
	) ss. (Individual)
COUNTY OF	)
The foregoing instrument was ac	knowledged before me this day of
•	
	Notary Public
	My commission expires:
STATE OF min nesota	
	) ss. (Partnership)
COUNTY OF Stevens	)
y Teral L will hehalf of Godden Hills 1	notary Public  My commission expires: 1-31-201
DUNTY OF Stevens	) SS. — (Gerporation My Conint. Exp. Jan. 31, 2018
The foregoing instrument was acknown	owledged before me this 27 day of Danke, 2010
poration, on behalf of the corporation.	11 11 lo. A
	Notary Public
	My commission explanation Substitution
s instrument was drafted by:	DENNIS L. SLEJTER NOTARY PUBLIC - MINNESOTA
Country Farm Credit Services 2 S. Atlantic Ave pris, MN 56267	My Comm. Exp. Jan. 31, 2015

AgC 8223c (12/2006) Source/Library/Forms/Credit-Forms

Space Above is for Recording Information

### MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made December 30, 2010, by and between Dallas Schott and Dee Schott (Land Owners hereinafter "Grantor") and Wulf Cattle Co., LLP (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

S1/2SE1/4 Sec. 6 T21N R27E of Black Hills Meridian Field 7-8 W1/2 Sec. 7 T21N R27E of Black Hills Meridian Field NW1/4 Sec. 8 T21N R27E of Black Hills Meridian Field /0 NE1/4 Sec. 8 T21N R27E of Black Hills Maridian Field 11 SE1/4 Sec. 9 T22N R27Eof Black Hills Meridian Field 13 NE1/4 Sec. 9 T22N R27E of Black Hills Meridian Field 14 E1/2 Sec. 10 T22N R27E of Black Hills Meridian Field 16 N1/2 Sec. 15 T22N R27E of Black Hills Meridian Field 18 - 19 E1/2 Sec. 16 T22N R27E of Black Hills Meridian Field 20 Field 12 NEAI4 Sec. 9 T21N R27E of Black Hills Meridian Field Field 13 SW1/4 Sec. 9 T21N R27E of Black Hills Meridian E1/2 Sec. 14 T21N R25E of Black Hills Meridian Field 39 NE1/4 Sec. 23 T21N R25E of Black Hills Meridian Field 40 S1/2 Sec. 32 T21N R25E of Black Hills Meridian Field N1/2 Sec. 4 T20N R25E of Black Hills Meridian Field W1/2 Sec. 26 T21N R25E of Black Hills Meridian Field W1/2 Sec. 35 T21N R25E of Black Hills Meridian Field

All in Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian Section 5: All of that part of the S1/2NE1/4 Lying North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the NW1/4 of Section 5, Township 21 North, Range 27 East of Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition. Together with an easement of right of way on, over and across Tract 1 McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to hauf and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such AgC 8223c (12/2006)

Page 1 of 4

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Grantor and Grantee hereby agree as follows:

- Easement To Aboly Livestock Bio-Solids: Grantor hereby grants to Grantse an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- Term of Agreement: This Agreement and the exements connected herewith shall become effective on the date first above written and shall remain in effect for a period of 15 years unless terminated earlier by mutual agreement between the parties.
- Application of Manure and Other Livestock Bio-solids: The parties hereto agree that Grantee shall be solely responsible for application of the manure and other livestock bio-solids to the Property, and the parties covenant and agree that:
  - A. Any and all application of manure and other livestock bio-solids shall be done in a good and husband like manner, taking into account weather conditions, soil conditions and time of year, all so as to reduce any odor that might emanate from such menure application.
  - B. That the application of manure and other livestock bio-solids shall be done in conformance with stale rules and local country zoring promances and in accordance with all other applicable permits, statutes, rules and regulations relating to such acts and practices.
  - C. At all times during the term of this egreement, Grantee will, so far as reasonably practicable, honor all requests and directions made by Grantor with respect to the timing, location and manner of any application of manure and other livestock blo-solids to the soll, and such application shall in no event be done in any way that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantee's application of manure and other itvestock blo-solids to the Property. In any calendar year, Gantee shall have the right to apply manure and other itvestock blo-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at epolicable agronomic rates.
  - D. Grantse is responsible for any claims, causes of action, demands or damages for property loss arising from or on account of its manure and other livestock blo-solids application and agrees to fully indemnify and hold harmless Grantor of and from all such claims. Grantor waives any claims, causes of action, demands or damages for property loss if Grantse's application of manure and other livestock blo-solids is equal to or less than the minimum quantity specified in C above. Any claim by Grantor for property loss will be limited to the value of the crope growing on the Property slegadly damaged by Grantse's action. Grantee shall have no responsibility for any claims, causes of action, demands or damages for personal injury and Grantor waives any claims for personal injury.
  - E. Nothing in this agreement shall require Grantee to apply manure and other livestock blo-solids to the Property.
  - F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuals or entitles an exament or right to apply manure and other livestock bio-solids to the Property. Other than this easement, Grantor has not granted any other individual or entity an exsement or right to apply manure and other investock bio-solids to the Property.
- G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.
- Strockstors and Assigns: This Agreement shall inure to the benefit of and be binding upon heirs, successors and
  assigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this
  Agreement are fully assignable without the consent of Granter.
- Execution of Decements: All parties agree to execute any and all additional documents that may be necessary to
  implement the full terms and conditions of this Agreement, including, but not limited to, any additional state or county
  permit forms that may be required.
- Termination [Ontonal]: If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will
  exercise reasonable efforts to find replacement property to which Grantee may apply manure and other livestock biosolids. If replacement property is located and Grantee obtains a manure sessment with respect to the same, this
  Agreement will be terminated.
- Entire Agreement: The foregoing constitutes the entire agreement between the parties.
- Severability: If one provision of this Agreement is held invalid, that shall not affect any other provision of this
  Agreement.

IN WITNESS WHEREOF, this Agreement has been executed of	n the day and year first above written.
GRANTORE:	
x_ Wally Shatt	x Well on Charl
Dalias Schott	Dee Schott
X	Χ
	v
^	X
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	GRANTEES:	andin	
	x June That onew	artuer X	
	Jers I. Wulf, Operations Management F	Artuer X	
	x Danis Wiff	FMP .	
	Dennie Wuif, Financial Motters Partner	X	
	X		
	Λ	X	
•	ACKNOWLEDGEMENTS .		
	STATE OF SULLY DAKET	71 .	
Sergiegin findt	STATE OF JUNG 10 10 1000	• •	
The sales	& COUNTY OF ( BYS ON	) ss. (Individual)	
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		My commission expires:	
	This instrument was draited by:		
	AgCountry Farm Credit Services 102 S. Atlantic Ave		4
	Morris, MN 56267		
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### MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made December 30, 2010, by and between Gary Rau (Land Owners hereinafter "Grantor") and Wulf Cattle Co., LLP (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

N1/2N1/2 Sec. 19 T22N R27E of Black Hills Meridian
SE1/4 Sec. 30 T22N R27E of Black Hills Meridian
SE1/4 Sec. 31 T22N R27E of Black Hills Meridian
NE1/4 Sec. 31 T22N R27E of Black Hills Meridian
NW1/4 Sec. 34 T22N R27E of Black Hills Meridian
NE1/4 Sec. 34 T22N R27E of Black Hills Meridian
NE1/4 Sec. 34 T22N R27E of Black Hills Meridian
Field 23
NE1/4 Sec. 34 T22N R27E of Black Hills Meridian
Field 27

All in Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian Section 5: All of that part of the S1/2NE1/4 Lying North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the NW1/4 of Section 5, Township 21 North, Range 27 East of Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition. Together with an easement of right of way on, over and across Tract 1 McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to haul and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such manure application and other related benefits.

WHEREAS, Grantor and Grantee have had mutual discussions with regard to entering into such an agreement and wish to reduce the agreement to writing.

NOW, THEREFORE, in consideration of the premises and under the mutual covenants, promises and conditions set forth herein. Grantor and Grantee hereby agree as follows:

- <u>Easement To Apply Livestock Bio-Solids:</u> Grantor hereby grants to Grantee an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- Term of Agreement: This Agreement and the easements connected herewith shall become effective on the date first

above written and shall remain in effect for a period of 15 years unless terminated serier by mutual agreement between the parties.

Application of Manure and Other Livestock Bio-splids: The parties hereto egree that Grantee shell be solely responsible for application of the manure and other livestock bio-solids to the Property, and the parties governant and

A. Any and all application of manure and other livestock bio-solids shall be done in a good and husband like manuer, taking into account weather conditions, soil conditions and time of year, all so as to reduce any odor that might emanata from such manure application.

B. That the application of manure and other livestock bio-solids shall be done in conformance with state rules and local county zoning ordinances and in accordance with all other applicable permits, statutes, rules and regulations relating to such acts and practices.

C. At all times during the term of this agreement, Grantee will, so far as reasonably predicable, honor all requests and directions made by Granter with respect to the timing, location and manner of any application of manner and other livestock blo-solids to the soil, and such application shall in no event be done in any way, that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantee's application of manure and other livestock blo-solids to the Property, in any calendar year, Grantee shall have the right to apply manure and other livestock bio-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at applicable agronomic rates.

D. Grantee is responsible for any claims, causes of action, demands or demages for properly loss arising from or on account of its manure and other livestock bio-solids application and agrees to fully indemnify and hold harmless Grantor of and from all such claims. Grantor waives any claims, causes of action, demands or damages for property loss if Grantee's application of manure and other fivestock bio-solids is equal to or less than the minimum quentity specified in C above. Any claim by Grantor for property loss will be limited to the value of the crope growing on the Property allegedly damaged by Grantee's action. Grantee shall have no responsibility for any claims, causes of action, demands or demages for personal injury and Grantor walvas any claims for personal

E. Nothing in this agreement shall require Grantee to apply manua and other tiveslock blo-solids to the Property.

F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuals or entities an essement or right to apply manure and other investock bio-solids to the Property. Other than this essement, Granior has not granted any other individual or entity an essement or right to apply manure and other livestock blo-solids to the Property.

G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.

Successors and Assigns: This Agreement shall inure to the benefit of and be binding upon helm, successors and assigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this Agreement are fully assignable without the consent of Grantor.

Execution of Documents: All parties agree to execute any and all additional documents that may be necessary to implement the full terms and conditions of this Agreement, including, but not timited to, any additional state or county

permit forms that may be required.

Termination [Contonel]: If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will exercise reasonable efforts to find replacement property to which Grantee may apply menure and other livestock blo-solids. If replacement property is located and Grantee obtains a manure easement with respect to the same, this Agreement will be terminated.

Entire Agreement: The foregoing constitutes the entire agreement between the parties.

Severability: If one provision of this Agreement is held invalid, that shall not affect any other provision of this

IN WITNESS WHEREOF, this Agreement has been executed on the day and year first above written.

GRANTORS:		
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x	. X	
GRANTEEN:  X	. x	The state of the s
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COUNTY OF LOTS ST	
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by Gary Rau	waster periode use mile
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	My commission expired 5-2-/3
STATE OF MINNESO 19	}
COUNTY OF Stevens	) ss. (Partnerehip)
COUNTY OF	)
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behalf of	
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	Notary Public Control of the Control
	My commission expires:
	NOTARY PUBLIC - MINNESOTA
STATE OF	My Comm. Exp. Jan. 31, 2015
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COUNTY OF	)
The foregoing leginement was networked	trad butter n.
by	iged before me this day of of
corporation, on behalf of the corporation.	
Selection of the corporation.	
•	
	Notary Public
	My commission expires:
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Country Farm Credit Services	
02 S. Atlantic Ave Iorris, MN 56267	
401118 <sup>4</sup> 1111 ≦476.0\	
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Page 3 of 3

### MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made December 30, 2010, by and between Bonnie Schott (Land Owners hereinafter "Grantor") and Wulf Cettle Co., LLP (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

NW1/4 Sec. 6 T21N R27E of Black Hills Meridian Field 7
SE1/4 Sec. 13 T21N R26E of Black Hills Meridian Field 17
SE1/4 Sec. 24 T21N R26E of Black Hills Meridian Field 4/, 4/2

All in Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian Section 5: All of that part of the S1/2NE1/4 Lying North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the NW1/4 of Section 5, Township 21 North, Range 27 East of Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition. Together with an easement of right of way on, over and across Tract 1 McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to haul and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such manure application and other related benefits.

WHEREAS, Grantor and Grantee have had mutual discussions with regerd to entering into such an agreement and wish to reduce the agreement to writing.

**NOW, THEREFORE,** in consideration of the premises and under the mutual covenants, promises and conditions set forth herein. Grantor and Grantee hereby agree as follows:

- <u>Easement To Apply Livestock Blo-Solids:</u> Grantor hereby grants to Grantee an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- <u>Term of Agreement:</u> This Agreement and the easements connected herewith shall become effective on the date first above written and shall remain in effect for a period of 15 years unless terminated earlier by mutual agreement between the parties.
- Application of Manure and Other Livestock Bio-solids: The parties hereto agree that Grantee shall be solely responsible for application of the manure and other livestock bio-solids to the Property, and the parties covenant and

A. Any and all application of manure and other livestock bio-solids shall be done in a good and husband like manner, faking into account weather conditions, soli conditions and time of year, all so as to reduce any odor that might emensis from such menura application.

B. That the application of menure and other livestock bio-solids shall be done in conformance with state rules and local county zoning ordinances and in accordance with all other applicable permits, statutes, rules and regulations

relating to such acts and practices.

C. At all times during the tarm of this agreement, Grantee will, so far as responsibly practicable, honor all requests and directions made by Grantor with respect to the timing, location and manner of any application of manure and other livestock big-solids to the soil, and such application shall in no event be done in any way that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantor's epplication of manura and other livestock blo-solids to the Property. In any calendar year, Grantor shall have the right to apply manura and other livestock blo-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at applicable agronomic rates.

D. Grantee is responsible for any claims, causes of action, demands or damages for properly loss arising from or on account of its manure and other ilvastock bio-solids application and agrees to fully indemnify and hold harmless Granter of and from all such claims. Granter waives any claims, causes of action, demands or demands for property loss if Grantee's application of manure and other investock bio-solids is equal to or less than the minimum quantity specified in C above. Any claim by Grantor for property loss will be limited to the value of the crops growing on the Property allegadly damaged by Granter's action. Grantee shall have no responsibility for any claims, causes of action, demands or damages for personal injury and Grantor waives any claims for personal injury and Grantor waives any claims for personal

E. Nothing in this agreement shall require Grantee to apply manura and other (ivestock blo-solids to the Property.

F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuals or entities an easement or right to apply manure and other livestock bio-solids to the Property. Other than this easement, Grentor has not granted any other individual or entity an easement or right to apply manure and other livestock blo-solids to the Property.

G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.

Successors and Assigns: This Agreement shall have to the benefit of and be binding upon hairs, successors and assigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this Agreement are fully assignable without the consent of Grantor.

Execution of Documents: All perfets agree to execute any and all additional documents that may be necessary to implement the full terms and conditions of this Agreement, including, but not limited to, any additional state or county

permit forms that may be required.

Termination (Cotional): If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will exercise reasonable efforts to find replacement property to which Grantee may apply manure and other it restock blo-solids. If replacement property is located and Grantee obtains a manure essement with respect to the same, this Agreement will be terminated.

Entire Agreement: The foregoing constitutes the entire agreement between the parties.

Severability. If one provision of this Agreement is held invalid, that shed not affect any other provision of this Adreement.

IN WITNESS WHEREOF, this Agreement has been executed on the day and year first above written.

GRANTORS:	
x Bounce Schott Bonnie Swhott	. x
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X	. x
GRANTERS:  X Lul J Wulf (om p)  Jeral La While, Operations Management Partner	×
X Donnie Will, Financial Matters Partner	) x
x	X
AgC B223c (12/2005)	Page 2 of 3

ACKNOWLEDGEMENTS	•	
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COUNTY OF CONSION	) so. (individuel)	
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STATE OF MINNE SOL	1	
	) 59. (Partnership) )	
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	Notary Public Programme	
	My commission expiree: 1- 200 PLUENNIS L.	
STATE OF	NOTARY PUBLIC My Comm. Exp.	-MINNESOTA Jan. 31, 2015
COUNTY OF	ss. (Corporation)	***************************************
The foregoing instrument was acknowledged by	ed before me this day of of	
corporation, on behalf of the corporation,	8	
•		
*	Notary Public	
	My commission expires:	
This instrument was drafted by: AgCountry Farm Credit Services 102 S. Atlantic Ave		

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### MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made December 30, 2010, by and between Sharon Walker (Land Owners hereinafter "Grantor") and Wulf Cattle Co., LLP (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

SW1/4 Sec. 4 T21N R27E of Black Hills Meridian Field 3
SE1/4 Sec. 5 T21N R27E of Black Hills Meridian Field 5
SW1/4 Sec. 5 T21N R27E of Black Hills Meridian Field 5

All in Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian Section 5: All of that part of the S1/2NE1/4 Lying North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the NW1/4 of Section 5, Township 21 North, Range 27 East of Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition. Together with an easement of right of way on, over and across Tract 1 McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to haul and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such manure application and other related benefits.

WHEREAS, Grantor and Grantee have had mutual discussions with regard to entering into such an agreement and wish to reduce the agreement to writing.

**NOW,** THEREFORE, in consideration of the premises and under the mutual covenants, promises and conditions set forth herein. Grantor and Grantee hereby agree as follows:

- <u>Easement To Apply Livestock Bio-Solids</u>: Grantor hereby grants to Grantee an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- <u>Term of Agreement:</u> This Agreement and the easements connected herewith shall become effective on the date first above written and shall remain in effect for a period of 15 years unless terminated earlier by mutual agreement between the parties.
- Application of Manure and Other Livestock Bio-solids: The parties hereto agree that Grantee shall be solely responsible for application of the manure and other livestock bio-solids to the Property, and the parties covenant and

acres that:

- A Any and all application of manure and other livestock bio-solide shall be done in a good and husband like manner, taking into account weather conditions, soil conditions and time of year, all so so to reduce any oder that might emanate from such manure application.
- B. That the application of manure and other investock bio-solids shall be done in conformance with state rules and local county zoning ordinances and in accordance with all other applicable permits, statutes, rules and regulations relating to such acts and practices.
- C. At all times during the term of this agreement, Grantee will, so far as reasonably precioable, honor all requests and directions made by Grantor with respect to the timing, location and manner of any application of menure and other livestock blo-solids to the soil, and such application shall in no event be done in any way that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantee's application of manure and other livestock blo-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at applicable agronomic rates.
- D. Grantee is responsible for any claims, causes of action, demands or damages for property loss erising from or on account of its manure and other livestock bio-solids application and agrees to fully indemnity and hold harmless Granter of and from all such claims. Granter weives any claims, causes of action, demands or damages for property loss if Grantee's application of manure and other livestock bio-solids is equal to or less than the minimum quantity specified in C above. Any claim by Granter for property loss will be limited to the value of the crops growing on the Property allegadity damaged by Grantee's action. Grantee shall have no responsibility for any claims, causes of action, demands or damages for personal injury and Granter waives any claims for personal injury.
- E. Nothing in this agreement shall require Grantee to apply menure and other livestock bio-solids to the Property.
- F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuels or entities an essement or right to apply manure and other livestock bio-solids to the Property. Other than this essement, Grantor has not granted any other individual or entity an essement or right to apply manure and other eventock bio-solids to the Property.
- G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.
- Successors and Assigns: This Agreement shall sture to the benefit of and be bloding upon heirs, successors and
  essigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this
  Agreement are fully assignable without the consent of Grantor.
- Execution of Cocuments: All perfect agree to execute any and all additional documents that may be necessary to
  implement the full terms and conditions of this Agreement, including, but not limited to, any additional state or county
  permit forms that may be required.
- Termination (Optional): If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will
  exercise reasonable efforts to find replacement property to which Grantee may apply manure and other livestock biosolids. If replacement property is located and Grantee obtains a manure easement with respect to the same, this
  Agreement will be terminated.
- Entire Agreement: The foregoing constitutes the entire agreement between the parties.
- Severability: If one provision of this Agreement is held inveild, that shall not affect any other provision of this
  Agreement.

IN WITNESS WHEREOF, this Agreement has been executed on the day and year first above written.

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	by Teval welf	risoged before me this 4 day of January 2011  Description of Willer partner(s), on
<b>~~~~~</b>	behalf of WULF CAHTE	Co. CLB a partnership.
\$ 0 D	ENNIS L. SLEITER	11-Met
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CAMMAN AND AND AND AND AND AND AND AND AND A	MANUALANA DE DANGO MANAGO	
	STATE OF	_ ) ss. (Corporation)
	COUNTY OF	- )
	The foregoing instrument was acknow by	redged before me this day of of
	corporation, on behalf of the corporation.	1
	,,	
		Notary Public
		My commission expires:
	This instrument was drafted by: AgCountry Farm Credit Services 102 S. Atlantic Ave Morris, MN 56267	

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Page 3 of 3

Section I: Sitemap Assessment and Land Treatment Information

### **Management Considerations For Nitrogen**

### **Groundwater Concerns**

The groundwater concern comes primarily from nitrogen. If not captured by plant roots, it can move down below the root zone and may enter the groundwater. The speed at which nitrate moves depends on the amount of precipitation and soil texture. Water moves through sandy soil much more rapidly than a clay soil.

Because nitrate moves through soil with water, it is extremely important that the rate applied, either as manure or fertilizer, does not exceed that which can be used by crops. Any nitrate remaining in the soil profile at the end of the season is subject to leaching.

<u>Water Quality Risk Assessment Maps</u> will be labeled with the symbol "L" on fields that are Vulnerable to N leaching.

If a field is determined highly vulnerable for nitrate leaching to an aquifer, all of the following management activities will be implemented.

- Prior to the application of nitrogen above starter application rates, a nitrate nitrogen test (zero to two foot and two to four foot sample) will be taken and analyzed. Or An acceptable alterative to the zero to four feet sampling method would be to take a zero to two foot sample every year within four weeks after crop harvest prior to nitrogen applications above starter rates as recommended by SDSU.
- 2. Soil samples (zero to six inches) should also be included and analyzed for P and K. Soil samples will be taken as per land grant university recommendations found on the back of the SDSU Soil Testing Laboratory Soil Sample Information Sheet, or SDSU-FS935, "Recommended Soil Sampling Methods for South Dakota."

### **Nitrogen Best Management Practices**

- Match manure nutrient applications to crop needs.
- Apply manure as close to the time of crop utilization as possible. Apply commercial
  fertilizer nitrogen in a sidedress or split application when fields are located over
  shallow aquifers or on soils that have a high leaching potential.
- Delay fall manure applications until soil temperatures drop below 50°F to minimize nitrate leaching and ammonia volatilization.
- Avoid applying manure on wet soils to minimize soil compaction, runoff, nitrate leaching and denitrification.
- Inject or incorporate the manure into the soil preferably within 24 hours for maximum nutrient-use efficiency and to reduce odor and runoff problems. Significant volatilization losses will occur when manure is left on the surface for several days.

### Nitrogen Recommendations Using Manure

Crops can contain large amounts of nitrogen (Table 4-1). In most cases only the grain is removed and the straw is returned to the soil, supplying nitrogen through mineralization in subsequent years. Because of this and the other sources of N such as nitrate N already in soil, soil organic matter, precipitation and legumes, crop removal alone is not a good estimate of the amount of N to apply.

**Table 4-1 Nitrogen Contained in Crops** 

	20 H 30 W BACKS	Plant Part	
Crop		Straw	
		pounds N	******
Corn (bu)	0.9	0.5	1.4
Soybeans (bu)	3.7	0.8	4,5
Wheat (bu)	1.6	0.8	2.6
Oats (bu)	0.9	0.4	1.3
Barley (bu)	1.1	0.4	1.5
Sunflowers (cwt)	2.8	2.4	5.2
Alfalfa (ton)			55
Grass (ton)			30

Table 4-2 Nitrogen Requirements of Crops

Crop	Unit	Nitrogen Required1/
Wheat	bu	2.5 x yield <sup>2/</sup>
Oats	bu	1.3 x yield
Barley		
malting	bu	1.5 x yield
feed	bu	1.7 x yield
Rye	bu	2.5 x yield
Flax	bu	3.0 x yield
Corn (grain)	bu	1.2 x yield
Corn (silage)	ton	10.4 x yield
Sorghum (grain)	bu	1.1 x yield
Sorghum, sudan (hay)	ton	25 x yield
Grass hay	ton	25 x yield
Sunflowers	lb	0.05 x yield
Edible beans	Ib	0.05 x yield
Millet	lb lb	0.035 x yield
Rape	cwt	6.5 x yield
Mustard	cwt	6.5 x yield
Safflower	lb	0.05 x yield
Buckwheat	bu	2.2 x yield
Potatoes	cwt	0.4 x yield

<sup>1/</sup> Available manure nitrogen or fertilizer nitrogen to apply is equal to the nitrogen requirement minus soil NO<sub>3</sub> – N to a 2-ft depth minus any legume credits.

2/ Yield goal

### **Management Considerations For Phosphorus**

### **Surface Water Concerns**

Surface water concerns focus primarily on Phosphorus. Phosphorus acts very differently in soils than nitrogen. It attaches tightly to soils and does not generally move down through the soil profile. This lack of movement through soils results in accumulations of phosphorus in soil if phosphorus rates, either from manure or fertilizer, are greater than crop removal.

Increases in phosphorus concentrations in soil can result in more phosphorus moving off the field either attached to soil particles lost by erosion or dissolved in the runoff water. In some situations phosphorus could move into surface waters with manure itself if the manure is applied in such a manner that it moves directly into waterways.

<u>Water Quality Risk Assessment Maps</u> will be labeled with the symbol "R" on fields that are Vulnerable to Phosphorus runoff.

- 1. In no case shall manure or organic by product applications (broadcast or incorporated/injected) be made within 100 feet of a surface water or conveyance; 35 feet if a perennial grass filter strip is established and maintained.
- 2. A minimum of a 35-foot wide perennial grass filter strip is required in all cases on the edges of fields that border a lake, river, or intermittent/perennial stream.
- 3. In selected cases based on Table 1, depending on soil test phosphorus and estimated soil loss in a field, a perennial grass filter strip maybe required within 100 feet of a surface water or conveyance if manure is applied based on nitrogen needs of a crop and not crop removal of phosphorus (see Table 1).

### **Phosphorus Based Manure Application**

If the manure application is required to be based on phosphorus crop removal, the application rate shall be based on phosphorus removed in the harvested portion of the crop.

Application can be based on multi-year phosphorus crop removal but cannot exceed the one year nitrogen crop need, and no manure may be applied to that field again until the applied phosphorus has been removed from the field via harvest and crop removal.

### (See Table 1 for additional information)

Usually fields with High soil test P and/or high runoff potential.

### **Phosphorus Best Management Practices**

- Establish and maintain grass filter strips at the point where water leaves the field to trap sediment and nutrients
- Control sheet and rill erosion by installing conservation practices including conservation tillage, contour farming, strip cropping, terraces and cover crops
- Control ephemeral erosion by installing grassed waterways, diversions and sediment retention structures.
- Incorporate or inject manure and commercial fertilizer where possible while maintaining sufficient crop residue levels for erosion control
- Grow high yielding, high phosphorus removing crops on fields with already high soil test phosphorus to reduce test levels

### How Phosphorus affects Soils Tests

Phosphorus rate recommendations are based on the phosphorus soil test. This test is an index of availability of phosphorus to plants. It is not a measure of total available phosphorus or total phosphorus in soil. However, as total phosphorus levels increase in soils, the soil test index usually increases also.

These categories represent a decreasing probability of a yield response to broadcast fertilizer or manure. The probability of response is from about 80 percent at the very low soil test level to less than a 20 percent chance when soil tests are in the very high range.

Table 4-3 Soil Test Calibration Levels Used for Phosphorus and Potassium in SD

	Name of Soil	Repaired the		Categories		V a Najara Na I a sa a a .
Nutrient	Test	Very Low	Low	Medium	High	Very High
		****	ррт е	xtractable (0-6 in	ch sample)	
Phosphorus	Bray P-1	0 – 5	6 – 10	11 – 15	16 – 20	21+
Phosphorus	Olsen	0 – 3	4 – 7	8 – 11	12 – 15	16+
Potassium	NH <sub>4</sub> Ac	0-40	41 - 80	81 - 120	121 - 160	161+

If phosphorus is applied at rates greater than crop removal (Table 4-4), phosphorus soil test levels will increase. As a very general rule of thumb, for every 20 pounds of phosphorus ( $P_2O_5$ ) applied and not removed by crops, the soil test index will increase by 1 part per million (ppm).

Following a good nitrogen application plan with manure in South Dakota can often result in a one to three ppm increase per year in the phosphorus soil test.

Table 4-4 Phosphorus Content of the Harvested Portion of Crops

As the phosphorus soil test index increases, the possibility of moving significant amounts of phosphorus off the field to surface water usually increases. The movement is both phosphorus attached to soil particles lost with erosion and phosphorus dissolved in the runoff water.

From 60 to 80 percent of the phosphorus in most manure is available to plants within the first year of application. After several years of

	of the Harvested Portion of Crops
Crop	P <sub>2</sub> O <sub>5</sub> (lbs)
Alfalfa (per ton)	12
Buckwheat (per bu)	0.53
Canola (per cwt)	1.5
Corn Grain (per bu)	0.35
Corn Silage (per ton)	4.3
Edible Beans (per cwt)	1,25
Feed Barley (per bu)	0.41
Flax (per bu)	0.7
Forage Sorghum (per ton)	5.8
Grass (per ton)	10
Malting Barley (per bu)	0.41
Millet (per cwt)	0.83
Mustard (per cwt)	1.5
Oats (per bu)	0.25
Potatoes (per cwt)	0.09
Rapeseed (per cwt)	1.5
Rye (per bu)	0.48
Safflower (per cwt)	1.14
Sorghum (per bu)	0.27
Soybean (per bu)	0.77
Sudan Grass (per ton)	5.8
Sunflowers (per cwt)	1.14
Wheat (per bu)	0.56

application, the amount of phosphorus available to plants from manure is equal to that applied with the manure each year.

1/ Source:
Jim Gerwing, Extension Soil Specialist

Ron Gelderman, Director, Soil Testing Lab South Dakota State University

### Manure Application On Frozen Ground

Manure shall not be applied to frozen, snow covered, or saturated soil if the potential risk for runoff exists. In South Dakota (SD), this is interpreted to mean no manure application during periods when the soil surface is frozen (approximately November 15 to March 30). However, care and common sense must always be used to make sure manure applications and potential runoff will not cause environmental degradation to surface water regardless of what time of year it is.

Liquid manure applications to frozen or snow-covered (winter) soil will not be allowed. In situations where a catastrophic system failure is imminent; manure may be applied to soils with slopes less than 4 percent provided that a 1,000-foot setback is maintained to a lakes, rivers, streams and a 300-foot setback to non-cropped wetland or conveyances to lakes, rivers, or streams.

Incidental winter application of solid manure, waste feed materials, snow, and ice will be allowed to facilitate the proper operation of open feedlots by allowing producers to clean along feed bunks, watering areas, and allow removal of snow and ice from open lots.

- 1. Frozen ground manure applications will not exceed the rate calculated in the nutrient budget for the application field based on the current fall soil test results and applications will be no more than 10 percent of the annual manure production.
- 2. Frozen ground applications will only be allowed on slopes that are four percent or less and will be prioritized using current soil loss calculations based on the water erosion prediction technology as listed in the SD Technical Guide. Fields with the lowest predicted soil loss will have the highest priority for winter applications.
- No manure application on floodplains (as defined by the Natural Resources Conservation Service (NRCS) in the soil survey as frequently or occasionally flooded).
- 4. No manure application within a 300-foot setback from conveyances or non-cropped wetlands.
- 5. No manure application within 1,000 feet of lakes, rivers, and named perennial streams.

Review and comply with other specific winter application requirements in the current SD General Livestock Permit regulations or your local county zoning ordinance when dealing with state and locally permitted facilities.

Failure to follow this guidelines could lead to United States Department of Agriculture contract violations and may result in monetary penalties due to breach of contract (see your contract appendix or contact your local NRCS office for further clarification).



### RUSLEZ Profile Frosion Calculation Record

Field !

S-WW-O-C-O; DaA Soil; No-Till Info: T1631, F1, NW1/4 3-21-26; C

Inputs: Rotation: Corn (Silage) - Winter Wheat -- Oats -- Corn (Grain) - Oats Location: South Dakota\Corson County

Soil: Corson, SD soils\DaA DAGLUM LOAM, 0 TO 3 PERCENT SLOPES\DAGLUM loam 85%

T value: 2.0 t/ac/yr

Avg. slope steepness: 3.0 % Slope length (horiz): 150 ft

File: profiles\Corson County

Wheat, winter 7in rows | bushels Corn, silage Oats, spring Oats, spring Corn, grain Vegetation CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 CMZ 04\c. Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 Management

Yield (# of units)

Yield units

6.0000 42.000 58.000

tons

56.000 58.000

bushels

ηq

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.59 t/ac/yr 0.59 t/ac/yr Soil loss for cons. plan:

Net C factor: 0.13

Net K factor: 0.22

Net LS factor: 0.39

Dafe	Date Operation		Out to our office of
200			Sun. res. cov. aner op. %
5/10/0	Planter, double disk opnr w/fluted coulter	Corn silage	81
9/1/0	Harvest, residue, forage chopper, complete	28	
27.7			
2/15/0	Drill or airseeder, double disk, w/ fluted	Wheat, winter 7in	15
	coulters	rows	
7/20/1	Harvest, killing crop 50pct standing stubble		75
	Signation Signature of the signature of		
4/15/2	Drill or airseeder, double disk, w/ fluted	Oats, spring	
	coulters		



### RUSLE2 Profile Frosion Calculation Record

Feld 2

Info: T1631, F2, NW1/4 3-21-26; CS-WW-O-C-O; RnB Soil; No-Till

File: profiles\Corson County Inputs: Rotation: Corn(silage) -- Winter Wheat -- Oats -- Corn(grain) - Oats
Location: South Dakota\Corson County
Soil: Corson, SD soils\RnB REGENT SILTY CLAY.LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85%

Slope length (horiz): 150 ft

Avg. slope steepness: 5.0 %

	Yield units   Yield (# of units)	6.0000	42.000	58.000	56.000	58 000
	Yield units	tons	pushels	pn	bushels	, 
Management	CMZ 04tc. Other Local Mgt Records/Corn Silage: WAM: Corn Silage: WAM: Community Town Vegetation		CMZ 04/c.Other Local Mgt Records/Corn Silage: WMV: Corn Silage: WM	CMZ 04/c. Other Local Mgt Records/Corn Silane MAA/- Corn Silane MA	CMZ 04/c. Other Local Mgt Records/Corn Silage, WAAV, Corn Silage, WAAV, Corn, 11, 23#2 Corn, grain	Spring String Court Clade, vvvv, Court, VVVV, Court, tv1, 23#2   Oats, spring

Contouring: a rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 1.1 t/ac/yr Soil loss for cons. plan: 1.1 t/ac/yr

Net C factor: 0.13

Net K factor: 0.26

Net LS factor: 0.64

Date	Date Operation	Vegetation	Cut we can offer a 0/
9.6		* cyclastor	Suit. Tes. COV. altel OD. %
9/10/0	5/10/0 Planter, double disk opnr w/fluted coulter	Corn, silage	61
9/1/0	Harvest, residue, forage chopper, complete	>	8 7
9/15/0	9/15/0 Drill or airseeder, double disk, w/ fluted	Wheat winter 7in	1. T.
	coulters	SWO	
7/20/1	Harvest, killing crop 50pct standing stubble		75
4/15/2	Drill or airseeder, double disk, w/ fluted	Oats, spring	7
	coulters		



### RUSLE2 Profile Frosion Calculation Record

Field 3

Info: T11198, F8, SW1/4 of 4-21-27; ShB Soil; C-C-WW-C-O Rotation; No-till

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%

File: profiles\default

T value: 5.0 t/ac/yr

Slope length (horiz): 50 ft

Avg. slope steepness: 2.0 %

	Yield units   Vield (# of units)	56,000	6.0000	42.000	56.000	58.000
	Yield units	bushels	tons	bushels	pushels	pq
			1, Z3 Corn, silage	1, 23 Wheat, winter 7in rows	, 23 Corn, grain	, 23   Oats, spring
		Records/Corn: Wheat; Oats, Corn; NT, Z3 Corn, grain	Records/Corn: Mhoat: Oct.: Oct.: Corn; N1, Z3 Corn, silage	Records/Com: M/hoot: Octs, Com; N1, 23 Wheat, winter 7in rows   bushels	Records/Corn. Wheat: Oats. Corn. NT 23 Corn, grain	Total, Wildat, Oals, Colli, M.
Management	CMZ 04\c. Other I ocal Mot Becom	CMZ 04\c. Other Local Mot Recon		g.	CMZ 04\c.Other Local Mot Record	

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.081 t/ac/yr Soil loss for cons. plan: 0.081 t/ac/yr

Net C factor: 0.033 Net K factor: 0.20

Net LS factor: 0.24

fice		
	Vegetation	Suff roe cour affor on 9/
ouble disk opnr w/fluted coulfer	Corn grain	oc cor cov. aner up, 70
Killing crop 50pot atonging at 1111	Soil, giani	00
willing and adder stationing stabble		888
double disk opnr w/fluted coulter	Corn. silage	84
andio		
Spare		1/5
arrseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	70
killing crop 50pct standing stubble		85
, 121 - 1-11 - 1		
, acubie disk opnr w/fluted coulter	Corn grain	83
	Operation Planter, double disk opnr w/fluted coulter Harvest, killing crop 50pct standing stubble Planter, double disk opnr w/fluted coulter Harvest, silage Drill or airseeder, double disk, w/ fluted coulters Harvest, killing crop 50pct standing stubble Planter, double disk opnr w/fluted coulter	ter, double disk opnr w/fluted coulter est, killing crop 50pct standing stubble ter, double disk opnr w/fluted coulter est, silage or airseeder, double disk, w/ fluted coulters est, killing crop 50pct standing stubble ter, double disk opnr w/fluted coulter



# RUSLE2 Profile Erosion Calculation Record

Info: T1637, F2, E1/2 of 5-21-26; Soil RcC; O-C-WW-C-O; No-till

Inputs:

Location: South Dakota\Corson County
Soil: Corson, SD soils\RcC REEDER-CABBA LOAMS, 6 TO 9 PERCENT SLOPES\REEDER loam 60%

File: profiles\Corson County

T value: 3.0 t/ac/yr Slope length (horiz): 200 ft Avg. slope steepness: 8.0 %

	Yield units Yield (# of units)	65.000		<u> </u>	J.	65.000
	Yield unit	pn	tons	sieusnq	bushels	pn
1/2	vegeration	Cats, spring	Corn, silage	Wheat, winter 7in rows	Corn, grain	Uats, spring
Wanagement	CIMZ. 04 to Uther Local Mgt Records/Corn Silage: VWV: Corn Silage: VAAA: Corn Silage: VAA	MZ 04/c. Other Local Mgt Records/Corn Silage WWW. Corn Silage, WWW. Co. Silage, WWW.	MZ 04/c.Other Local Mgt Records/Corn Silage, WAM: Corn Silage, WWW, Colli, N1, 23#2	CMZ 04/c.Other Local Mgt Records/Corn Silage, WWV. Corn Silage, WWW, Corn, N.F. 23#2 Wheat, winter 7in rows   bushels	CMZ 04/c. Other Local Mgt Records/Corn Silage: WWY: Corn Silage: WWY, Corn, NT, 23#2   Corn, grain	27, T.T., COLI CHARGE, VVVV, COLII, INI, 2.3#Z

Contouring: a. rows.up-and-down.hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Sediment delivery: 0.13 t/ac/yr Soil loss for cons. plan: 0.13 t/ac/yr

Net C factor: 0.015

Net K factor: 0.17

Net LS factor: 0.96

3/18/2010



### RUSLEZ Profile Frosion Calculation Record

Field S

Info: T11199, F3, SW1/4 of 5-21-27; Soil An; Rotation CS-WW-C-O-C; No-Till

inputs:

Location: South Dakota\Corson County

File: profiles\default

Soil: Corson, SD soils\An ARNEGARD LOAM\ARNEGARD loam 90%

I value: 5.0 t/ac/yr

Slope length (horiz): 200 ft

Avg. slope steepness: 1.0 %

Yield units   Yield (# of units)	6.0000	$\vdash$	/ · ·	58.000	56.000
Yield units	tons	bushels	bushels	pn	bushels
	Reords/Com: Wheat, Oats, Com; NI, 23   Corn, silage	CMZ 04\c. Other Local Mort Records/Com: Wheat, Oals, Com; N1, Z3 Wheat, winter 7in rows   bushels	CMZ 04\c Other I ocal Mot Boosday Coll., Wiled, Oats, Corr; N I, Z3 Corn, grain	CMZ 04/c. Other I neal Mof Records/Com: 144-14	

Contouring: a. rows up-and-down hill

Strjps/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs;

Sediment delivery: 0.045 t/ac/yr Soil loss for cons. plan: 0.045 Vac/yr

Net C factor: 0.036 Net K factor: 0.17

Net LS factor: 0.14

Date	Operation	Vegetation	Surf res con affor as 0/
•		. 330.00	Od 1. 100. 001. 00. 100. 100
0/41/6	Planter, double disk opnr w/fluted coulter	Corn silage	84
9/1/0			7.4
9/15/0	Drill or airceader double diet wy fluted aguitter	10 11	
5	cim of an account, double disk, W/ linted coullets   wheat, Winter / In rows   / U	vyneat, winter / in rows	0/
7/20/1	Harvest, killing crop 50pct standing stubble		85
5/15/2		Corn grain	82
10/15/2		, , ,	7.0
1 2 2	יימי יכטי, אוווווא סוסף ססףכר פומוחוון פוחחום		λ
4/15/3	4/15/3   Drill or airseeder, double disk, w/ fluted coulters   Oats spring	Oats spring	85
		2	2



## RUSLE2 Profile Erosion Calculation Record

Field 6

Info: T11199, F6, SE1/2 of 5-21-27; Soil RaB; Rotation CS-WW-C-O-C; No-Till

Inputs:

Location: South Dakota\Corson County
Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%

File: profiles\default

T value: 3.0 t/ac/yr

Slope length (horiz): 100 ft

Avg. slope steepness: 4.0 %

	Yield units   Yield (# of units)	6.0000		7	58.000	58,000
	Yield units	tons	pushels	pushels	nq	blishels
Management		Records/Com; Mhoot: Oct. Com; N1, Z3 Com, sitage	CMZ 04/c. Other Local Mot Records/Corn: Mn. 24 Wheat, winter 7in rows bushels	CMZ 04/c Other I ocal Mot Records/Com: Wileat, Oats, Corn; N1, Z3 Corn, grain	CMZ 04% Other I ocal Mot Records/Com: Wife 1, Oats, Com; NT, Z3 Oats, spring	with the state of

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.12 t/ac/yr Soil loss for cons. plan: 0.12 t/ac/yr

Net C factor: 0.030 Net K factor: 0.17

Net LS factor: 0.47

1			
Date	Operation	Vegetation	Suff res cov affer on %
5/15/0	Planter, double disk opnr w/fluted coulter	Corn eilago	04
0/1/0		ડેઇકાર, આવેપુત	04
	naivesi, siiage		74
9/15/0	Drill or aireador double dist Acid of the		
5	Dilli of all secuel, double disk, W/ fluted coulters   Wheat, winter /in rows   70	Wheat, winter 7in rows	70
7/00/7	Hantost Villiag oran ROBA attachment		
201	i lai vest, kiiliig ciop sopel sialidii g supple		22
5/15/2	Planter double diet and wiffurted souther		
1	ranto, acapte also obili Willated Couller	Com grain	82
10/15/2	10/15/2   Harvest, killing crop 50pct standing stubble		70
27.1	2000		5
4/15/3	4/15/3   Utill of airseeder, double disk, W/ fluted coulters   Oats spring	Oats spring	85
		)	2



### RUSLE2 Profile Erosion Calculation Record

Feld 7

Info: T1764, F1, NW1/4 of 6-21-27; Soil ShB; Rotation CS-WW-C-O-C; No-Till

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%

File: profiles\default

Slope length (horiz): 50 ft vafue: 5.0 t/ac/yr

Avg. slope steepness: 2.0 %

Yield (# of units) 42.000 56.000 56.000 6.0000 58.000 Yield units pushels bushels bushels tons рп Wheat, winter 7in rows Corn, silage Oats, spring Corn, grain Vegetation Corn, grain CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3 CMZ 04\c.Other Local Mgt Records\Corn; Wheat, Oats; Corn; NT, Z3 CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3 CMZ 04\c.Other Local Mgt Records\Com; Wheat; Oats; Com; NT, Z3 CMZ 04\c.Other Local Mgt Records\Com; Wheat; Oats; Com; NT, Z3 Wanagement

Confouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Sediment delivery: 0.082 t/ac/yr 0.082 t/ac/yr Soil loss for cons. plan:

Net C factor: 0.033 Net K factor: 0.20

Net LS factor: 0.24

Γ		-	
Uate	Operation	Vedefation	Sinf ros cou affer on 0/
		- Socialion	July 103, COV. Allel OD, %
0/61/6	Planter, double disk opnr w/fluted coulter	Corn silane	84
9/1/0		000	77
l			
9/15/0	Unil or airseeder, double disk, w/ fluted coulters   Wheat winter 7in rows 70	Wheat winter 7in rows	70
112011	rial Vest, Killing Grop Super Standing Stubble		25.
5/15/2	Planter, double disk opnr w/flufed coulter	Corn arain	80
(		ومارا والعال	70
2/2	10/15/2   Harvest, Killing crop 50pct standing stubble		2.2
7.5			
5	4/12/3   Dilli of all seeder, double disk, W/ fluted coulters   Oats, spring	Oats, spring	85
			,



## RUSLE2 Profile Frosion Calculation Record

Field 8

Info: T11329, F1, SE1/4 of 6-21-27; Soil ShB; Rotation CS-WW-C-O-C; No-Till

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%

File: profiles\default

F value: 5.0 t/ac/yr

Slope length (horiz): 50 ft

Avg. slope steepness: 2.0 %

Vield (# of units)	CHIED TO EL COLL	8 0000	2000	42 000	000.	58,000	20.00	58 000	00.00	56.000	
Yield units		tons		bushels		hishala	2000	- IIC		pushels	
Vegetation	1	Corn, silage	14 // 1	wneat, winter /in rows		Corn, grain		Cats, spring		corn, grain	
Other I ocal Mat Boostale Carry	Carlot Ecode Iviga Necolids/Corn. Wheat Oats - Oats - Art - Ar	Other Local Mat Booglass 188	Stiller Focal Might Necolds Collin Wheelt Cate: Com: NT 72 1	Ther I ocal Mat Boossis	TI ICL FOCAL INIGH RECOIDS/COTH WITH AN INTERIOR	Ther I are Mark B	Julei Local Migt Records/Corn. Wheat: Oats: Com. Nit as	ther loop was Barried Cars, Colli, NI, 23	Allel Local Migl Records/Corn. Wheat: Oats: Oats: Nit 22		
CMZ 04\c		CM7 04\c		CM7 04\c	5	CM7 OAK	JIVIE 01 15.	CM7 0.45	C111/2 04 15.		
	Vegetation	ecords/Corn: Wheat: Oats: Com: NT 72 Cont	Records\Corn; Wheat; Oats, Corn; NT, Z3 Corn, silage tons	ecords\Corn; Wheat; Oats; Corn; NT, Z3 Corn, silage	ecords\Corn; Wheat; Oats; Corn; NT, Z3 Corn, silage ecords\Corn; Wheat; Oats; Corn; NT, Z3 Wheat, winter 7in rows	Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, silage Records\Corn; Wheat; Oats; Corn; NT, Z3 Wheat, winter 7in rows Records\Corn; Wheat Oats; Corn; NT, Z3 Wheat, winter 7in rows	Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, silage Records\Corn; Wheat; Oats; Corn; NT, Z3 Wheat, winter 7in rows Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, grain	Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, silage Records\Corn; Wheat; Oats; Corn; NT, Z3 Wheat, winter 7in rows Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, grain Records\Corn; Wheat Oats; Corn; NT, Z3 Corn, grain	Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, silage Records\Corn; Wheat; Oats; Corn; NT, Z3 Wheat, winter 7in rows Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, grain Records\Corn; Wheat; Oats; Corn; NT, Z3 Oats, spring	Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, silage Records\Corn; Wheat; Oats; Corn; NT, Z3 Wheat, winter 7in rows Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, grain Records\Corn; Wheat; Oats; Corn; NT, Z3 Oats, spring Records\Corn; Wheat Oats; Corn; NT, Z3 Oats, spring	Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, silage Records\Corn; Wheat; Oats; Corn; NT, Z3 Wheat, winter 7in rows Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, grain Records\Corn; Wheat; Oats; Corn; NT, Z3 Oats, spring Records\Corn; Wheat; Oats; Corn; NT, Z3 Corn, grain

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Sediment delivery: 0.082 t/ac/yr Soil loss for cons. plan: 0.082 t/ac/yr

Net C factor: 0.033 Net K factor: 0.20

Net LS factor: 0.24

Uate	Operation	Vegetation	Surf res con affer on 9/
5/15/0	Diameter 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	Compagn.	July 153. COV. aller Up, 70
$\langle  $	rialitet, double disk opni Witiuted coulter	Corn silage	. 78
9/1/0	Harvest, silage	00000	
0/45/0	Oscilla Control of the Control of th		
700	Drill of all seeder, double disk, w/ fluted coulters   Wheat winter 7in rows   70	Wheat, winter 7in rows	70
7/20/1	Harvest, killing crop 50pct standing stubble		30
L		,	Co
7/01/0	Flanter, double disk opnr w/fluted coulter	Corn grain	82
0/4 1/0		3.00	70
7010	10/10/2 Hallvest, killing crop 50pct standing stubble		87
4/15/3	Drill or aircoadar double diele 11 the 11 the		
0 0	Dim of all seeder, double disk, w/ littled coulters   Oats, spring	Uats, spring	
		,	



## RUSLE2 Profile Frosion Calculation Record

Field 9

Info: T11329, F2, W1/2 of 7-21-27; Soil ShB; Rotation C-C-WW-C-0; No-till

inputs:

Location: South Dakota\Corson County Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%

File: profiles\default

Slope length (horiz): 50 ft Avg. slope steepness: 2.0 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Sediment delivery: 0.081 Vac/yr Soil loss for cons. plan: 0.081 t/ac/yr

Net C factor: 0.033 Net K factor: 0.20

Net LS factor: 0.24

2,00	Continue		
Date	Operation	Vegetation	Surt. res. cov. after op, %
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, grain	86
10/15/0	Harvest, killing crop 50pct standing stubble		88
5/15/1	Planter, double disk opnr w/fluted coulter	Corn, silage	84
9/1/1	Harvest, silage		75
9/15/1	Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   70	Wheat, winter 7in rows	70
7/20/2	Harve		85
5/15/3	Planter, double disk opnr w/fluted coulter	Corn, grain	82



## RUSLEZ Profile Erosion Calculation Record

Feld to

Info: T1898, F1, NW1/4 8-21-27; CS-WW-C-B-C; ShB Soil; No-Till

inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%

value: 5.0 t/ac/yr

Slope length (horiz): 170 ft

Avg. slope steepness: 5.0 %

File: profiles\Corson County

Yield (# of units) 43.000 63.000 9.0000 39.000 63.000 Yield units Bushels bushels bushels bushels tons Wheat, winter 7in rows Barley, spring Corn, silage Corn, grain Corn, grain Vegetation CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 CMZ 04\c. Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 CMZ 04\c. Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2 Management

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.51 t/ac/yr 0.51 t/ac/yr Soil loss for cons. plan:

Net C factor: 0.073

Net K factor: 0.20

Net LS factor: 0.65

Coto	Operation		
- 1	Operation	Vegetation	Surf res cov after on %
5/10/0	Planter, double disk opnr w/fluted coulter	Corn silane	62
9/1/0	Harvest, residue, forage chopper, complete	) 6	75
9/15/0	Drill or airseeder, double disk, w/ fluted coulters Wheat winter 7in rows 21	Wheat winter 7in rows	**************************************
7.00.7		יייייייייייייייייייייייייייייייייייייי	
1/20/1	Harvest, killing crop bupct standing stubble		
5/15/2	5/15/2 Planter, double disk opnr w/flitted coulter	Corn arain	7.7
0000		July, grail	
10/20/2	10/20/2   Harvest, residue, forage chopper, complete		13
4/30/3	4/30/3 Drill or airseeder, double disk, w/ fluted couffers	luted couffers Barley spring	15



# RUSLE2 Profile Erosion Calculation Record

Field 11

Info: T1426, F1, NE1/4 of 8-21-27; Soil An; Rotation CS-WW-C-B-C; No-Till

Inputs:

File: profiles\default

Location: South Dakota\Corson County Soil: Corson, SD soils\An ARNEGARD LOAM\ARNEGARD loam 90%

T value: 5.0 t/ac/yr Slope length (horiz): 200 ft

Avg. slope steepness: 1.0 %

	Yield units   Yield (# of units)	6.0000	(	1	43.000	56 000
	Yield units	tons	spersnq	sleusna	Bushels 43.000	bushels
Management		Boords/Corn. 10ft. ct. Col., Col., Col., Silage	CMZ 04\c. Other I ocal Mot Records Com. Wheat, Oats, Corn; N J. Z3 Wheat, winter 7in rows   bushels	CMZ 04\c. Other I ocal Mat Records\Corg.\Mileat\Corg.\Mil	Records/Corn: Wheat, Oats, Corn; NT, Z3 Barley, spring	Control of the Color, NI, 23   Corn, grain

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Sediment delivery: 0.048 t/ac/yr Soil loss for cons. plan: 0.048 t/ac/yr

Net C factor: 0.038

Net K factor: 0.17

Net LS factor: 0.14

Date	Operation	Vegefation	Surf res con affer on %
5/15/0	Planter double disk oner wifting on the		San: 100. 001. and 0p, 70
	אינונים המוובו	com, silage	
9/1/0	Harvest, silage		- 22
0/4/0			
3/10/0	Urill of all seeder, double disk, w/ fluted coulters   Wheat, winter 7in rows	Wheat, winter 7in rows	68
1/20/2			
11711	rial vest, Killing Crop Supct Standing Stubble		84
5/15/2			
5	I Janiel, actuale disk opin Williated Course	Com, grain	82
10/15/2	10/15/2   Harvest, killing crop 50pct standing stubble		86
9.00			
4/30/3	4/30/3   Drill or airseeder, double disk, w/ fluted coulters   Barley, spring	Barley, spring	84



### South Dakota

### **RUSLE2 CSP Record**

Info:

Date: June 11, 2013

Name: Wulf Cattle Company

Tract and Field #'s: Field #12A

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%

Slope length (horiz): 200 ft Avg. slope steepness: 2.0 %

Man.	Management
1	b.Mullti-year Rotation Templates\Continuous crop dryland rotations\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Vegetation	Yield units	Yield (# of units)
Wheat, spring 7in rows	bushels	29.000
Corn, silage	tons	75.000
Sunflower	lbs	1822.0

Adjust res. burial level: Normal res. burial

General yield level: Set by user

Outputs:

T value: 5.0 t/ac/yr

Soil loss for cons. plan: 1.5 t/ac/yr

Soil conditioning index (SCI): 0.08 Avg. annual slope STIR: 10.0

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

### The SCI is the Soil Conditioning Index rating.

- > If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.
- > If the index is a positive value, soil organic matter levels are predicted to increase under that system.
- > A positive SCI meets the soil criteria for the Conservation Security Program.

### The STIR value is the Soil Tillage Intensity Rating.

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



### South Dakota

### RUSLE2 CSP Record

Info:

Date: June 11, 2013

Name: Wulf Cattle Company

Tract and Field #'s: Field #12B

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%

Slope length (horiz): 600 ft Avg. slope steepness: 2.0 %

Man.	Management
1	b.Mullti-year Rotation Templates\Continuous crop dryland rotations\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Vegetation	Yield units	Yield (# of units)
Wheat, spring 7in rows	bushels	29.000
Corn, silage	tons	75.000
Sunflower	lbs	1822.0

Adjust res. burial level: Normal res. burial

General yield level: Set by user

Outputs:

T value: 5.0 t/ac/yr

Soil loss for cons. plan: 1.9 t/ac/yr

Soil conditioning index (SCI): 0.05 Avg. annual slope STIR: 10.0

Wind & irrigation-induced erosion for SCI: 0 t/ac/vr

### The SCI is the Soil Conditioning Index rating.

- If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.
- > If the index is a positive value, soil organic matter levels are predicted to increase under that system.
- > A positive SCI meets the soil criteria for the Conservation Security Program.

### The STIR value is the Soil Tillage Intensity Rating.

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



# RUSLE2 Profile Erosion Calculation Record

Feld /3 Info: T1929, F1 SW1/4 of 9-21-27; Soil ShB; CS-WW-CS-WW-C; No-till

inputs:

Location: South Dakota\Corson County Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%

File: profiles\default

F value: 5.0 t/ac/yr

Slope length (horiz): 50 ft

Avg. slope steepness: 2.0 %

	Yield units   Vield (# of units)	Talling (# Or alling)	6.0000	lels 42 000	200	6,000	-1-	leis 42.000	bushels 56 000	-
	Viel		SUOI	n rows   bust		tons	Total Charles	SUC CWO	snq	
	Vegetation	Corn silado	2000	Wheat, winter 7i	Comp. 111.	corri, suage	Wheat winter 7	יייייייייייייייייייייייייייייייייייייי	Corn, grain	
Management	CMZ 04/c Other I oral Mrt Beardal Com City Com City Company	CM2 CM Silage: WWV; Corn Silage: WWV; Corn: NT 73	CMZ 041C. Uther Local Mgt Records/Corn Silage: WANY: Corn Silage: MAN: Corn Silage:	CMZ 04/c. Other Local Mot Records/Corn Silvan Silva	TI SIBOR WIN. COLL SIBOR WIN.	CMZ 04/c Other Local Mot Records/Corn Silons 1444; CMZ 04/c, Other Local Mot Records/Corn Silons	CM7 241 CIN Stage: WW. Corn Stage; WW. Corn Stage; WW. Corn: NT 73	Livit U41C. Uther Local Mdt Records/Com Silane: NAAA: Com Silane: Watt. Com Silane:	Corn, Girdye, VVVV, Colli, N1, Z3   Corn, grain	

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.076 t/ac/yr Soil loss for cons. plan: 0.076 t/ac/yr

Net C factor: 0.031 Net K factor: 0.20

Net LS factor: 0.24

Date	Date Operation	Vegetation	Suf res con affor on 6/
(1)			Jan. 100. 00. 01.00 00, /0
0/01/0	5/15/0   Planter, double disk opnr w/fluted coulter	Corn. silage	98
9/1/0	Harvest, silage	8	76
0/4/2/0	D		
9/10/0	3/13/0   Drill or alrseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   72	Wheat, winter 7in rows	72
1,007			
1/07//	Harvest, Killing crop 50pct standing stubble		86
5/15/2	Ì	1000	00
1		Colff, Sliage	033
9/1/2	Harvest, silage		78
3			
8/15/2	9/15/2   Urill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   75	Wheat, winter 7in rows	75
			,



## RUSLE2 Profile Frosion Calculation Record

Field 14

Info: T11460, F1, NE1/4 of 9-22-27; Soil RSB; CS-WW-CS-WW-C; No-till

Location: South Dakota\Corson County Soil: Corson, SD soils\RsB RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES\RHOADES loam 50%

T value: 2.0 t/ac/yr Slope length (horiz): 200 ft

Avg. slope steepness: 6.0 %

	Yield units   Yield (# of units)	6.0000	42.000	6.0000	42.000	28 000
	Yield units	tons	bushels	tons .	pushels	hushale
	Vegetation	Corn, silage	Wheat, winter 7in rows	Corn, silage	Wheat, winter 7in rows	Com, grain
Management	CMZ 04\c. Other Local Mgt Records\Corn Silage: \M\N'- Corn Silage: \M\M\. Corn Silage:	CMZ 04/c.Other Local Mgt Records/Corn Silage: WMW; Corn Silage; WWW; Corn; N I , Z3	CMZ 04\c.Other Local Mgt Records\Corn Silage: WWW. Corn Silage: WAWF Corn Silage: WWW. Corn Silage: WAWF Corn Silage: WA	CMZ 04/c. Other Local Mgt Records/Corn Silage: WMV: Corn Silage: W	CMZ 04\c.Other Local Mgt Records\Corn Silage: VMV/ Corn Silage: MAN/ Corn Silage: MA	23

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Sediment delivery: 0.24 t/ac/yr Soil loss for cons. plan: 0.24 t/ac/yr Net C factor: 0.027 Net K factor: 0.22

Net LS factor: 0.74

Date	Operation	Vegetation	Suf res cov affer on %
5/15/0	5/15/0 Planter double dist oper wiffluted ocultar		can: 100, 001, and 00, 70
5	risk opili willuted coullet	Corn, silage	86
9/1/0	9/1/0 Harvest, silage		76
9/15/0	9/15/0 Drill or aircoador double diet with the server		
5	Dim of an accouct, upuble disk, W/ Huten conflers	wheat, winter / in rows	- 72
7/20/1	7/20/1   Harvest, killing crop 50pct standing stubble		86
5/15/2		Corn silada	83
9/1/2		2800 1000	78
9/15/2	9/15/2   Drill or airseeder, double disk w/ fluted coulters. Wheat winter Zin rows 75	Wheat winter 7 in rows	75



# RUSLE2 Profile Erosion Calculation Record

Feld 15

Info: T1894, F3, SE1/4 of 9-22-27; Soil RaA; CS-WW-CS-WW-C; No-till

Inputs:

Location: South Dakota\Corson County
Soil: Corson, SD soils\RaA REEDER LOAM, 0 TO 2 PERCENT SLOPES\REEDER loam 90%

File: profiles\default

T value: 3.0 t/ac/yr Slope length (horiz): 150 ft Avg. slope steepness: 1.0 %

	Yield units   Yield (# of units)	8 6.0000	<del> </del>	1	$\vdash$	
		, Z3 Corn, silage tons	, Z3 Wheat, winter 7in rows bus	, Z3 Corn, silage tons	, Z3 Wheat, winter 7in rows bus	Z3 Corn, grain
Management Management	CMZ (MA) Other Local Mot Becondol Care Sile Will Sile	CMZ 04/c Other I ocal Mot Records/Com Siloge, WWW, Corn Silage, WWW; Corn; NT, Z3   Corn, silage	CMZ 04/c Other Local Met Records/Corn Siloge, WWW, Corn Silage; WWW; Corn; NT, Z3   Wheat, winter 7in rows   bushels	CMZ 04% Other Local Mat Boogday Com, Silage, WWW, Corn Silage, WWY, Corn; NT, Z3 Corn, Silage	CMZ 04\cappa Other Local Mot Boordol Silage; WVV; Corn Silage; WW; Corn; NT, Z3   Wheat, winter 7in rows   bushels	Corn, Grain Myt Necotastical Strage; WWY; Corn Strage; WWY; Corn; NT, Z3   Corn, grain

Contouring: a. rows up-and-down hill

Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.042 t/ac/yr Sediment delivery: 0.042 t/ac/yr

Net C factor: 0.034

Net K factor: 0.17

Net LS factor: 0.14

Date	Date Operation	Vegetation	Surf res con affer on %
		202000	07 '20 121'S . 80'S . 80'S . 180'
5/15/0	5/15/0   Planter, double disk opnr w/fluted coulter	Corn, silage	86
9/1/0	Harvest, silage		76
9/12/0	9/15/0   Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   72	Wheat, winter 7in rows	72
7/20/1	7/20/1   Harvest, killing crop 50pct standing stubble		86
5/15/2	5/15/2   Planter, double disk opnr w/fluted coulter	Corn, silage	83
9/1/2	9/1/2 Harvest, silage		78
9/15/2	9/15/2   Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   75	Wheat, winter 7in rows	75



# RUSLE2 Profile Erosion Calculation Record

Feld 16

Info: T1900, F1, E1/2 of 10-22-27; Soil RsB; CS-WW-CS-WW-C; No-till

Location: South Dakota\Corson County

Soil: Corson, SD soils\RsB RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES\RHOADES loam 50%

File: profiles\default

Slope length (horiz): 150 ft

Avg. slope steepness: 6.0 %

Management

Yield units | Yield (# of units) 42.000 6.0000 6.0000 42.000 56.000 pushels bushels bushels tons tons Wheat, winter 7in rows Wheat, winter 7in rows Corn, silage Corn, silage Corn, grain Vegetation CMZ 04\c.Other Local Mgt Records\Corn Silage; \WW; Corn Silage; \WW; Corn; NT, Z3 CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3 CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3 CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3 CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Sediment delivery: 0.22 t/ac/yr Soil loss for cons. plan: 0.22 t/ac/yr

Net C factor: 0.026

Net K factor: 0.22

Net LS factor: 0.72

Γ			
Date	Operation	Vegetation	Surf res cov after on %
5/15/0	5/15/0   Planter, double disk opnr w/fluted coulter	Corn silane	86
9/1/0	Harvest, silage	000000000000000000000000000000000000000	76
9/15/0	9/15/0   Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   72	Wheat, winter 7in rows	72
7/20/1	Harvest, killing crop 50pct standing stubble		86
5/15/2	5/15/2   Planter, double disk opnr w/fluted coulter	Corn. silage	83
9/1/2	9/1/2 Harvest, silage	0	78
9/15/2	9/15/2   Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   75	Wheat, winter 7in rows	75



# RUSLE2 Profile Frosion Calculation Record

Field M

Info: T1763, F1, SE1/4 of 13-21-26; Soil RaB; CS-WW-C-SF-SW; No-till

Location: South Dakota\Corson County
Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%

File: profiles\default

T value: 3.0 t/ac/yr

Slope length (horiz): 200 ft

Avg. slope steepness: 4.0 %

	Yield units   Yield (# of units)	s 6.0000	+	7		hels 28 000
		Corn, silage tons	Wheat, winter 7in rows bus	Corn, grain bus	Sunflower lbs	Wheat, spring 7in rows bus
Wanadement	CMZ 04/c Other I ocal Mat Becardel Care Sile 1999	CMZ 04/c Other I ocal Mot Records/Corn Silage, WWY, Corn Silage; WWY, Corn; NT, Z3 Corn, silage	CMZ 04th Other Local Mot Becardologia Silver Silver Stage; WW; Corn; NT, Z3   Wheat, winter 7in rows   bushels	CMZ 04/c Other I ocal Mat Document Colling Silage, WWY, Corn Silage, WW; Corn; NT, Z;	CMZ 04\triangle Office I ocal Mort Recorded Silogo, Www. Corn Silage; WW; Corn; NT, Z3 Sunflower	The state of the s

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.18 t/ac/yr Soil loss for cons. plan: 0.18 t/ac/yr Net C factor: 0.042 Net K factor: 0.17

Net LS factor: 0.50

Date	Operation	Vegetation	Surf res cov after on %
5/15/0	5/15/0 Planter, double disk opnr w/fluted coulter	Corn. silage	58
9/1/0			55
9/15/0	Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7 in rows   54	Wheat, winter 7in rows	54
7/20/1	Harvest, killing crop 50pct standing stubble		83
5/15/2	5/15/2 Planter, double disk opnr w/fluted coulter	Corn, grain	81
10/15/2	10/15/2   Harvest, killing crop 50pct standing stubble	Additional designation of the second	87
5/25/3	5/25/3   Planter, double disk opnr w/fluted coulter	Sunflower	83



# RUSLEZ Profile Erosion Calculation Record

Field 18

Info: T1892, F2, N 1/2 of 15-22-27; Soil DaA; WW-CS-WW-CS-SF; No-till

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\DaA DAGLUM LOAM, 0 TO 3 PERCENT SLOPES\DAGLUM loam 85%

File: profiles\default

T value: 2.0 t/ac/yr

Slope length (horiz): 150 ft

Avg. slope steepness: 3.0 %

	Yield units   Yield (# of units)	\$ 42.000	Π			+-
	Yield u	pushel	tons	bushels	pushels	200
	Vegetation	Wheat, winter 7in rows	Corn, silage	Wheat, winter 7in rows	Corn, grain	Sunflower
Management	CMZ 04/c. Other Local Mat Records Corn Silvas: MAM. Co. 6:1	CMZ 04/c.Other Local Mat Records/Corn Silage: NAW, Corn Silage; WWW; Corn; NT, Z3 Wheat, winter 7in rows   bushels	CMZ 04\c.Other Local Mot Records\Corn Silogs, WMM, Colli Silage	CMZ 04/c Other I ocal Mat Records/Corp Siloss Www, Corn Silage, WW; Corn; NT, Z3	CMZ 04\c Other I ocal Mot Becardol Com Silage; WWY; Corn; NT, Z3 Corn, grain bushels	Mary Corn; NT, Z3

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.090 t/ac/yr Soil loss for cons. plan: 0.090 t/ac/yr

Net C factor: 0.021 Net K factor: 0.22

Net LS factor: 0.36

Date	Operation	Vegetation	Suf res cov affer on %
2			0, '00 1010 . CO . CO . CO . CO
N/12/0	Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   53	Wheat, winter 7in rows	53
7/20/1	Harvest, killing crop 50pct standing stubble		80
5/15/2	Planter, double disk opnr w/fluted coulter	Corn silada	70
		Colli, silago	
9/1/2	Harvest, killing crop 50pct standing stubble		91
3.0			
2/21/8	Urill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   92	Wheat, winter 7in rows	92
7/20/3	Handet Villing order 50not etangling attitude		
2007	Traing Study Supply Statistics of the statistics		94
5/25/4	Planter, double disk opnr w/fluted coutter	Com grain	88
		9,000	3



# RUSLEZ Profile Erosion Calculation Record

Field

Info: T1892, F3, N 1/2 of 15-22-27; Soil SgA; WW-CS-WW-CS-SF; No-till

Inputs:

Location: South Dakota\Corson County Soil: Corson, SD soils\SgA SAVAGE SILT LOAM, 0 TO 3 PERCENT SLOPES\SAVAGE silt loam 85%

Slope length (horiz): 100 ft

Avg. slope steepness; 2.0 %

Viold unite   Viold # 25	(Silun to # pror	42.000	6.0000	+		56.000	
Vield units	יוכות מווויס	bushels	tons	plisheld	2000	bushels 56 000	v.C.
Management Vegetation View		7in rows	CMZ 04\c. Other I ocal Mot Records\Corn Silogo, www, Corn; NV, Corn; NV, 23 Corn, silage tons	CMZ 04% Other I could be seen as a county of the county of	Aurel Local Might Records Corn Silage: MANA Corn	CMZ 04\c Other I and Mark Booked State Control of the County of the Coun	

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.090 t/ac/yr Soil loss for cons. plan: 0.090 t/ac/yr

Net C factor: 0.021 Net K factor: 0.22

Net LS factor: 0.36

0/45/0	Operation	Vegetation	Surf res cov after on %
	Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   53	Wheat winter 7in rows	53
7/20/1	Harvest, killing crop 50pct standing stubble		80
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, silage	79
9/1/2	Harvest, killing crop 50pct standing stubble		91
9/15/2	9/15/2   Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   92	Wheat, winter 7in rows	92
7/20/3	Harvest, killing crop 50pct standing stubble		94
5/25/4	5/25/4   Planter, double disk opnr w/fluted coulter.	Corn, grain	88



# RUSLE2 Profile Frosion Calculation Record

Field 20

Info: T1901, F1, E1/2 of 16-22-27; Soil RsB; CS-WW-CS-WW-CS; No-till

Inputs:

Location: South Dakota\Corson County
Soil: Corson, SD soils\RSB RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES\RHOADES loam 50%

File: profiles\Corson County

T value: 2.0 Vac/yr

Slope length (horiz): 150 ft

Avg. slope steepness: 7.0 %

	Yield units   Yield (# of units)	9 0000			0000	4	43 000	~+	00000
	Yield ur	tons	hishale	2	tons		bushels		fons
	Vegetation	Corn, silage	Wheat, winter 7in rows		Corn, silage	14/1	Wheat, Winter 7in rows		Corn, silage
Management	CMZ 04\c. Other I ocal Mot Records\Corn Silozo:\Www. Silozo	CMZ 04\c Other I ocal Mat Pecardo Com Silage, WWV; Corn Silage; WWV; Corn; NT, Z3#2   Corn, silage	CM7 ON Other I com Maria Neconal Silage; WWV; Corn; NT, Z3#2   Wheat, winter 7in rows hirshelp	CIVIZ 04 IC. OILIE! LOCA! MIG! RECORDS/COM SIJAGE: WAN! COM SIJAGE: NAT 7240	CM7 Od/s Other I am Mat Barrand Comment of the Comment of the Community of	CHICA CHICA LOCAL MICH RECOLDS/COLD SILBORY MANY COLD SILBORY MANY COLD SILBORY NOW.	CMZ 04/c Other I coul Mat Booglass Commence, very, com onage, vvvv, com, ni, 23#2   vvneat, winter 7in rows   bushels	CHILL OF INCIDENCE INCIDENCE INCIDENCE IN THE SHARE WAY. TOTA STATE STATE TO THE STATE OF THE ST	Slage VVVV, COIII, INI, 23#2   COIII, Slage

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.47 t/ac/yr Soil loss for cons. plan: 0.47 t/ac/yr

Net C factor: 0.045

Net K factor: 0.22

Net LS factor: 0.87

Date	Date Operation	Vegetation	Surf. res. cov. affer on %
5/10/0	5/10/0 Planter, double disk opnr w/fluted coulter	Corn. silage	79
9/1/0	9/1/0 Harvest, residue, forage chopper, complete		22
9/15/0	9/15/0   Drill or airseeder, double disk, w/ fluted coulters	Ited coulters Wheat, winter 7in rows 28	28
7/20/1	7/20/1 Harvest, killing crop 50pct standing stubble		78
5/15/2	5/15/2 Planter, double disk opnr w/fluted coulter	Corn. silage	
9/1/2	9/1/2 Harvest, residue, forage chopper, complete		15
9/15/2	9/15/2   Drill or airseeder, double disk, w/ fluted coulters   Wheat, winter 7in rows   22	Wheat, winter 7in rows	22



## RUSLEZ Profile Erosion Calculation Record

Field 21

Info: T10091, F4, N1/2 of 19-22-27; Soil StA; CS-WW-CS-WW-CS; No-till

Inputs:

File: profiles\Corson County Location: South Dakota\Corson County Soil: Corson, SD soils\StA STADY LOAM, 0 TO 2 PERCENT SLOPES\STADY loam 85%

T value: 4.0 t/ac/yr

Slope length (horiz): 150 ft

Avg. slope steepness: 2.0 %

į	Yield units   Yield (# of units)	tons 9.0000	bushels 43.000	tons 9.0000	bushels 43.000	J
		Corri, silage	Wheat, winter 7in rows	Corn, silage	Wheat, winter 7in rows	Corn, silage
Management	CMZ 04\c.Other Local Mat Records\Corn Silage: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	CMZ 04\c.Other Local Mot Records\Corn Silage, WWY, Corn Silage, WWY, Corn; N1, 23#2	CMZ 04\c.Other Local Mgt Records\Corn Silage, NVVV, Corn Silage, WWV, Corn, N I, Z3#2 Wheat, winter 7in rows   bushels	CMZ 04\c.Other Local Mot Records\Corn Silage, \text{VAAA}. Corn Silage, \text{VAAA}. Corn Silage tons	CMZ 04\c.Other Local Mot Records\Corn Silage, WMY: Corn Silage, WWW, Corn, N. 1, 23#2   Wheat, winter	Control of the contro

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.13 t/ac/yr Soil loss for cons. plan: 0.13 t/ac/yr

Net C factor: 0.050

Net K factor: 0.20

Net LS factor: 0.26

DateOperationVegetationSur5/10/0Planter, double disk opnr w/fluted coulterCorn, silage799/1/0Harvest, residue, forage chopper, completeWheat, winter 7in rows289/15/0Drill or airseeder, double disk, w/ fluted coultersWheat, winter 7in rows287/20/1Harvest, killing crop 50pct standing stubble785/15/2Planter, double disk opnr w/fluted coulterCorn, silage779/1/2Harvest, residue, forage chopper, complete159/1/2Drill or airseeder, double disk, w/ fluted coulter15	ion Surf. res. cov. affer on %			winter 7in rows 28	78	lage 77	15	Signature Time and the signature of the
		coulter	complete	Drill or airseeder, double disk, w/ fluted coulters Wheat,	Harvest, killing crop 50pct standing stubble	coulter	<u>a</u>	9/15/2 Drill or airseeder double disk w/ fluted coulters Wheat winter Zin rause 22



# RUSLE2 Profile Erosion Calculation Record

Fich 22

Info: T1767, F2, E1/2 of 30-22-27; Soil StA; O-C-O-C-O; No-till

Inputs:

Location: South Dakota\Corson County Soil: Corson, SD soils\StA STADY LOAM, 0 TO 2 PERCENT SLOPES\STADY loam 85%

File: profiles\Corson County

T value: 4.0 t/ac/yr Slope length (horiz): 150 ft Avg. slope steepness: 1.0 %

	Vegetation Yield units   Yield (# of units)	65.000	63.000	65.000	63.000	65 000
į	Yield units	nq	bushels	pq	pushels	pq
	Vegetation	Oats, spring	Corn, grain	Oats, spring	Corn, grain	Oats, spring
Management	CMZ 04\c.Other Local Mot Records\Porn Silaas: 1888; S. S.	CMZ 04/c.Other I ocal Mot Records/Corp Signal Way, Corn Silage; WW; Corn; NT, Z3#2   Oats, spring   bu	CMZ 04/c Other I ocal Mot Records/Corn Siloge, www, Corn Silage; WWV; Corn; NT, Z3#2   Corn, grain   bushels	CMZ 04\C Other I ocal Mat Records\Corr Silage; WWY; Corn Silage; WWY; Corn; NT, Z3#2	CMZ 04\c.Other   ocal Mot Records\Corp Silons\Wardard Navi. Corn. NVV; Corn. NT, Z3#2   Corn. grain   bushels	with the street of the street

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Soil loss for cons. plan: 0.040 Vac/yr Sediment delivery: 0.040 Vac/yr

Net C factor: 0.027

Net K factor: 0.20

Net LS factor: 0.14

Г			
5	Operation	Vegetation	Vegetation   Surf. res. cov. after on %
۵	4/15/0 Drill or airseeder, double disk, w/ fluted coulters   Oats, spring   87	Oats, spring	87
Ĭ	7/15/0 Harvest, killing crop 50pct standing stubble		96
Ω	Planter, double disk opnr w/fluted coulter	Corn, grain 94	94
<b>—</b>	10/20/1   Harvest, killing crop 50pct standing stubble		94
Ц	4/15/2 Drill or airseeder, double disk, w/ fluted coulters   Oats, spring   92	Oats, spring	92
-1	Harvest, killing crop 50pct standing stubble	2	95
_	5/10/3 Planter, double disk opnr w/fluted coulter	Corn, grain 91	91



## RUSLE2 Profile Erosion Calculation Record

Field 23

Info: T1767, F5, N1/2 of 31-22-27; Soil Gr; O.C.O.C.O.

Inputs:

Location: South Dakota\Corson County Soil: Corson, SD soils\Gr GRAIL SILTY CLAY LOAM\GRAIL silty clay loam 90%

File: profiles\Corson County

T value: 5.0 t/ac/yr

Slope length (horiz): 200 ft

Avg. slope steepness: 1.0 %

	Г		1	Т	_	Ţ
	Vegetation Yield units   Yield /# of units	65.000	63.000	65.000	63.000	65 000
	Yield units	pn	pushels	nq	sjeysng	ng
	Vegetation	Oats, spring	Corn, grain	Oats, spring	Corn, grain	Oats, spring
Management	CMZ Odly Other I and Mat Beandale City	CMZ 04\c Other I ocal Mot Becardo/Com Silon, WWY, Corn Silage, WWY, Corn, NT, Z3#2 Oats, spring bu	CMZ 04\c Other 1 ocal Mat Becardol Car Silage, WW, Corn Silage; WW; Corn; NT, Z3#2   Corn, grain   bushels	CMZ 04\text{CMZ 04\text{Corn} Other I ocal Mot RecordeCorn Silone	CMZ-04\circ Other Local Mot Records\Corn Silons May, Corn, NT, Z3#2   Corn, grain   bushels	Mary Corn; NT, Z3#2

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.054 t/ac/yr Soil loss for cons. plan: 0.054 t/ac/yr

Net C factors 0.027

Net K factor: 0.26

Net LS factor: 0.14

Date	Date Operation	Vegetation	Vegetation   Surf. res. cov. after op. %
4/15/0	4/15/0   Drill or airseeder, double disk, w/ fluted coulters   Oats, spring   87	Oats, spring	87
7/15/0	7/15/0 Harvest, killing crop 50pct standing stubble		96
5/10/1	Planter, double disk opnr w/fluted coulter	Corn, grain	94
10/20/1	10/20/1   Harvest, killing crop 50pct standing stubble		94
4/15/2	Drill or airseeder, double disk, w/ fluted coulters   Oats, spring   92	Oats, spring	92
7/20/2	Harvest, killing crop. 50pct standing stubble		95
5/10/3	Planter, double disk opnr w/fluted coulter	Corn, grain	91



## RUSLE2 Profile Frosion Calculation Record

Field 24

Info: T1767, F6, SE1/4 of 31-22-27; Soil ShA; O-C-O-C-O; No-till

Inputs:

Location: South Dakota\Corson County Soil: Corson, SD soils\ShA SHAMBO LOAM, 0 TO 2 PERCENT SLOPES\SHAMBO loam 90%

File: profiles\Corson County

T value: 5.0 t/ac/yr Slope length (horiz): 100 ft

Avg. slope steepness: 2.0 %

	Vegetation Yield units   Yield (# of units)	65.000	63.000	65.000	63.000	65 000
	Yield units	pq		1	↓	
	Vegetation	Oats, spring	Corn, grain	Oats, spring	Corn, grain	Oats, spring
Management	CMZ 04tc Other I oral Mat Becorde/Com Site 1888; S	CMZ 04/c. Other I ocal Mot Records/Corn Silage; VWV; Corn Silage; VWV; Corn; NT, Z3#2   Oats, spring   bu	CMZ 04\c, Other I ocal Mot Records/Corn Silage; WWV; Corn Silage; WWV; Corn; NT, Z3#2   Corn, grain   bushels	CMZ 04/c Other I ocal Mot Records/Corn Silage; WWV; Corn Silage; WWV; Corn; NT, Z3#2	CMZ 04tc Other Local Mot Beandaton Silage, WW, Corn Silage; WW; Corn; NT, Z3#2   Corn, grain   bushels	with the state of

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.065 t/ac/yr Sediment delivery: 0.065 t/ac/yr

Net C factor: 0.024 Net K factor: 0.20

Net LS factor: 0.25

-	The second secon		
)ate	Date Operation	Vegetation	Vegetation   Surf. res. cov. after on %
/15/0	4/15/0   Drill or airseeder, double disk, w/ fluted coulters   Oats spring   87	Oats spring	87
7/15/0	Harvest, killing crop 50pct standing stubble	62	96
5/10/1	Planter, double disk opnr w/fluted coulter	Corn, grain 94	94
0/20/1	10/20/1 Harvest, killing crop 50pct standing stubble		
115/2	4/15/2 Drill or airseeder, double disk, w/ fluted coulters   Oats, spring   92	Oats, spring	92
7/20/2	Harvest, killing crop 50pct standing stubble		95
5/10/3	Planter, double disk opnr w/fluted coulter	Corn, grain 91	91



# RUSLE2 Profile Frosion Calculation Record

Field 25

Info: T1638, F1A, S1/2 of 34-22-26; W-C-O-C-B, RsB Soil; No-Till

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\RsB RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES\RHOADES loam 50%

T value: 2.0 t/ac/yr

File: profiles\Corson County

Yield (# of units) 28.000 63.000 65.000 63.000 Yield units Bushels Wheat, spring 7in rows | bushels bushels bushels ភ្ន CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill | Barley, spring Oats, spring Corn, grain Corn, grain Vegetation CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill CMZ 04\c. Other Local Mgt Records\SW-C-SF-Notill CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill Avg. slope steepness: 7.0 % Slope length (horiz): 150 ft Management

a. rows up-and-down hill Contouring:

39.000

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

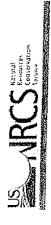
Sediment delivery: 0.30 Vac/yr Soil loss for cons. plan: 0.30 t/ac/yr

Net C factor: 0.028

Net K factor: 0.22

Net LS factor: 0.85

Date	Date Operation	Vegetation	Suff res. cov. after on %
4/15/0	4/15/0 Drill or airseeder, double disk, w/ fluted	Wheat, spring 7in	88
	coulters	rows	
7/20/0	Harvest, killing crop 50pct standing stubble		88
5/15/1	Planter, double disk opnr w/fluted coulter	Corn, grain	82
10/20/1	10/20/1 Harvest, killing crop 60pct standing stubble		83
4/15/2	Drill or airseeder, double disk, w/ fluted	Oats, spring	83
	coulters		



## RUSLEZ Profile Erosion Calculation Record

Feld 26

Info: T1638, F1B; S1/2 of 34-22-26; W-C-O-C-B, DaA Soil; No-Till

inputs:

Location: South Dakota\Corson County
Soil: Corson, SD soils\DaA DAGLUM LOAM, 0 TO 3 PERCENT SLOPES\DAGLUM loam 85%

File: profiles\Corson County

T value: 2.0 Vac/yr

Slope length (horiz): 200 ft

Avg. slope steepness: 2.0 %

CMZ 04\c. Other Local Mgt Records\SW-C-SW-C-SF-Notill Wheat, spring 7in rows bushels CMZ 04\c. Other Local Mgt Records\SW-C-SW-C-SF-Notill Corn, grain bushels CMZ 04\c. Other Local Mgt Records\SW-C-SW-C-SF-Notill Oats, spring bushels CMZ 04\c. Other Local Mgt Records\SW-C-SW-C-SF-Notill Corn grain bushels	g 7in rows	Yield units bushels bushels bu	Yield units Yield (# of units) bushels 28,000 bushels 63,000 hushels 63,000
01/c Otto-1-21 11 11 11 11 11 11 11 11 11 11 11 11 1		01017	00.00
U4/C-Utrier Local Mgt Records/SW-C-SW-C-SF-Notill   Barley sn		Dicholo	00000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill   Barley spring		ļ	00.000

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Sediment delivery: 0.11 Vac/yr Soil loss for cons. plan: 0.11 Vac/yr

Net C factor: 0.034 Net K factor: 0.22

Net LS factor: 0.26

Date	Date   Operation	Vegetation	Surf. res. cov. after op, %
4/15/0	4/15/0 Drill or airseeder, double disk, w/ fluted	Wheat, spring 7in	89
	coulters	rows	
7/20/0	Harvest, killing crop 50pct standing stubble		89
5/15/1	Planter, double disk opnr w/fluted coulter	Corn, grain	82
10/20/1	10/20/1   Harvest, killing crop 60pct standing stubble		83
4/15/2	Drill or airseeder, double disk, w/ fluted	Oats, spring	83
	coulters		



# RUSLE2 Profile Erosion Calculation Record

Feld 27

Info: T1770, F1, NW1/4 of 34-22-27; W-C-W-C-W, ShA Soil; No-Till

Location: South Dakota\Corson County
Soil: Corson, SD soils\ShA SHAMBO LOAM, 0 TO 2 PERCENT SLOPES\SHAMBO loam 90%

File: profiles\Corson County

T value: 5.0 t/ac/yr

Slope length (horiz): 150 ft

Avg. slope steepness: 2.0 %

Management	Vegetation	Viold unite	Viald units   Viold # 2f iz.	
CMZ DAYO Othor I cool Mark Days is 1011 Cool		STATE OF STATE	(S) = 0 = 0 = 0 = 0 = 0	
CIVIZ 04 (C. OLI JEI L'OCAL MIGL RECORDS) SVV-C-SVV-C-SF-Notil	Wheat spring 7in rowe		000 00	
CMZ ON'S Other I see Mart Bear 13.0%; See See See See See See See See See Se	יייים לאיווא לייים אים וייי	~~~	20.000	
CIVIZ 04/C. CILIEI LOCAL INGL RECORDS/SVV-C-SVV-C-SF-Notil	Corn grain	picholo	000 63	
CM7 Other Debal Mart Barrier Control of the Control	3,3,4,1	Significan	00.00	
CINIZ 04 (COLICE LOCAL NIGH RECORDS/SVV-C-SW-C-SK-NOTILL	Wheat spring 7in rows	olodoid	000 00	
CM7 OAD OFFICE TARTED TO THE DAY DOWN THE DAY DUSINGS	יייים אין האוווא אין וחאום	Single	Zo.000	
CIVIL 04 (C. CILIEI LOCAL MIGH RECORDS/SVV-C-SVV-C-SF-Nofil) Corn grain	Corn grain	hicholo	000	
CMZ Odio Other Land Mark B.	90m, 91mm	Day Icis	000.00	
CMZ 041/COLINE LOCAL MIGH RECORDS/SVV-C-SW-C-SF-Notil   Wheat spring 7in rows   hysbels	Wheat spring 7in rows	hichaic	28 000	
	S	2000	700.07	

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

### Outputs:

Sediment delivery: 0.13 t/ac/yr Soil loss for cons. plan: 0.13 t/ac/yr

Net C factor: 0.046 Net K factor: 0.20

Net LS factor: 0.26

Dafe	Date Operation	Vegetation	Surf. res. cov. after op, %
4/15/0	4/15/0 Drill or airseeder, double disk, w/ fluted	Wheat, spring 7in	L L
	coulters	rows	
7/20/0	Harvest, killing crop 50pct standing stubble		81
5/15/1	5/15/1   Planter, double disk opnr w/fluted coulter	Corn, grain	74
10/20/1	10/20/1 Harvest, killing crop 60pct standing		79
	stubble		



# RUSLE2 Profile Frosion Galculation Record

Field 28

Info: T1766, F1, NE1/4 of 34-22-27; W-C-WC-W, An Soil; No-Till

Inputs:

File: profiles\Corson County

Location: South Dakota\Corson County
Soil: Corson, SD soils\An ARNEGARD LOAM\ARNEGARD loam 90%
T value: 5.0 t/ac/yr

Slope length (horiz): 100 ft

Avg. slope steepness: 2.0 %

Wanagement	Vegetation	Vield unite	Viold unite   Viold # of it.
	- Security	יומים מיוויי	rieio (# or units)
CIVIZ 0410: Unier Local Mgt Records/SWV-C-SW-C-SF-Notill   Wheat spring Zin rows   hishele   28 000	Wheat spring 7in rowe	olohoid	20 000
CM7 Odlo Others Committee	יייים אייים אייים אייים אייים	SIDILISM	20.000
CIVIZ 04 (C. OLLIFE) LOCAL MIGT RECORDS/SVV-C-SVV-C-SF-Notill   Corn grain	Corn grain	Not of of of	000 69
2017 041-041	Somi grant		00.00
CM2 0416. Other Local Mgt Records/SW-C-SM-C-SF-Notill   Wheat spring Zin rouge   bushale	Wheat spring 7in rough		20,000
CARZ Odic Other I am in the control of the control	יייים לייים אייים		20.000
CIVIZ 041C. CITIET LOCAL MIGH RECORDS/SVV-C-SVV-C-SF-Notill   Corn grain		Special	83 000
CM7 04/2 Other 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	3,000	•	00.00
CIVIL 0410. Office Local Mgt Records/SVV-C-SW-C-SF-Notill   Wheat spring 7in rows   hisbals	Wheat spring 7in rows	hichele	28 000
	Carolina Simple facility	2000	7000

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.11 t/ac/yr Net C factor: 0.046 Net K factor: 0.17 Net LS factor: 0.25

Sediment delivery: 0.11 t/ac/yr

Date	Operation	Vegetation	Surf. res. cov. after op, %
4/15/0	4/15/0 Drill or airseeder, double disk, w/ fluted	Wheat, spring 7in	77
	coulters	rows	
7/20/0	Harvest, killing crop 50pct standing		18.
,	stubble		
5/15/1	5/15/1   Planter, double disk opnr w/fluted coulter	Corn, grain	74
10/20/1	10/20/1 Harvest, killing crop 60pct standing		62
	stubble		



Info: Field 29, N 1/2, Section 4, T 20 N, R 25 E

profiles\Corson Default

Inputs:

Location: South Dakota\Corson County
Soil: Corson, SD soils\SgB SAVAGE SILT LOAM, 3 TO 6 PERCENT SLOPES\SAVAGE silt loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.5 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs: T value: 5.0 t/ac/yr

Soil loss for cons. plan: 0.32 t/ac/yr



Info: Field 30, NW 1/4, Section 4, T 21 N, R 26 E

profiles\Corson Default

Location: South Dakota\Corson County Soil: Corson, SD soils\RaC REEDER LOAM, 6 TO 9 PERCENT SLOPES\REEDER loam 85%

Slope length (horiz): 150 ft

Avg. slope steepness: 7.5 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr Soil loss for cons. plan: 0.080 t/ac/yr



Info: Field 31, N 1/2, S 21 N, R 26 E

profiles\Corson Default

Location: South Dakota\Corson County
Soil: Corson, SD soils\RnB REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85%

Avg. slope steepness: 4.0 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Base management: b.Muliti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr Soil loss for cons. plan: 0.047 t/ac/yr



Info: Field 32, NE 14, S 4, T 21 N, R 26 E

profiles\Corson Default

Inputs:

Location: South Dakota\Corson County Soil: Corson, SD soils\RpC REGENT-WAYDEN SILTY CLAY LOAMS, 6 TO 15 PERCENT SLOPES\REGENT sifty clay loam 50% Slope length (horiz): 150 ft Avg. slope steepness: 10 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr Soil loss for cons. plan: 0.39 t/ac/yr



Info: Field 33, N ½, S 7, T 21, R 26 E

profiles\Corson Default

Location: South Dakota\Corson County
Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%

Avg. slope steepness: 4.0 %

Confouring: a. rows up-and-down hill

Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr

Soil loss for cons. plan: 0.11 t/ac/yr



Info: Field 34, NE 1/4, Section 7, T 21 N, R 26 E

profiles\Corson Default

Inputs: Location: South Dakota\Corson County Soil: Corson, SD soils\RcB REEDER-CABBA LOAMS, 3 TO 6 PERCENT SLOPES\REEDER loam 60% Slope length (horiz): 150 ft

Contouring: a. rows up-and-down hill

Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr Soil loss for cons. plan: 0.21 t/ac/yr



Info: Field 35, W 1/2, S 10, T 21 N, R 25 E

profiles\Corson Default

Location: South Dakota\Corson County Soil: Corson, SD soils\RnB REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85% Slope length (horiz): 150 ft

Avg. slope steepness: 4.0 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr

Soil loss for cons. plan: 0.31 t/ac/yr



Info: Field 36, SE 14, Section 10, T 21 N, R 25 E

profiles\Corson Default

Location: South Dakota\Corson County
Soil: Corson, SD soils\VeB VEBAR FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES\VEBAR fine sandy loam 85%

Slope length (horiz): 150 ft

Avg. slope steepness: 4.0 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr Soil loss for cons. plan: 0.22 t/ac/yr



Info: Field 37, S 1/2, Section 11, T 21 N, R 25 E

profiles\Corson Default

Location: South Dakota\Corson County Soil: Corson, SD soils\Gr GRAIL SILTY CLAY LOAM\GRAIL silty clay loam 90%

Slope length (horiz): 150 ft Avg. slope steepness: 1.5 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs: T value: 5.0 t/ac/yr

Soil loss for cons. plan: 0.070 t/ac/yr



Info: Field 38, W 1/2, Section 12, T 21 N, R 25 E

profiles\Corson Default

### Inputs:

Location: South Dakota\Corson County Soil: Corson, SD soils\RnB REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85%

Slope length (horiz): 150 ft

Avg. slope steepness: 4.0 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr Soil loss for cons. plan: 0.093 t/ac/yr



Info: Field 39, E 1/2, Section 14, T 21 N, R 25 E

profiles\Corson Default

Location: South Dakota\Corson County
Soil: Corson, SD soils\RnB REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %

Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Base management: b.Muliti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr Soil loss for cons. plan: 0.095 t/ac/yr



Info: Field 40, NE 1/4, Section 23, T 21 N, R 25 E

profiles\Corson Default

Location: South Dakota\Corson County Soil: Corson, SD soils\SgB SAVAGE SILT LOAM, 3 TO 6 PERCENT SLOPES\SAVAGE silt loam 85% Slope length (horiz): 150 ft

Avg. slope steepness: 4.5 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

### Outputs:

T value: 5.0 t/ac/yr Soil loss for cons, plan: 0.079 t/ac/yr



Info: Field 41, SE 1/4, Section 24, T 21 N, R 26 E

profiles\Corson Default

Location: South Dakota\Corson County
Soil: Corson, SD soils\An ARNEGARD LOAM\ARNEGARD loam 90%

Slope length (horiz): 150 ft

Avg. slope steepness: 1.5 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs: T value: 5.0 t/ac/yr

Soil loss for cons. plan: 0.011 t/ac/yr



Info: Field 42, SE 1/4, Section 24, T 21 N, R 26 E

profiles\Corson Default

### Inputs:

Location: South Dakota\Corson County
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Base management: a.Single Year/Single Crop Templates\Corn, grain\Corn, grain; NT, Z3

Outputs: T value: 5.0 t/ac/yr Soil loss for cons. plan: 0.069 t/ac/yr



## RUSLE2 Erosion Galculation Record

Info: Field 43, W 1/2, Section 26, T 21 N, R 25 E

profiles\Corson Default

Location: South Dakota\Corson County
Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%

Avg. slope steepness: 4.0 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr Soil loss for cons. plan: 0.15 t/ac/yr



## RUSLE2 Erosion Calculation Record

Info: Field 44, S 1/2, Section 32, T 21 N, R 25 E

profiles\Corson Default

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\VeB VEBAR FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES\VEBAR fine sandy loam 85%

Slope length (horiz): 150 ft

Avg. slope steepness: 4.0 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr

Soil loss for cons. plan: 0.16 t/ac/yr



# RUSLE2 Erosion Galculation Record

Info: Field 45, NE 1/4, Section 32, T 22 N, R 26 E

profiles\Corson Default

Location: South Dakota\Corson County
Soil: Corson, SD soils\RcC REEDER-CABBA LOAMS, 6 TO 9 PERCENT SLOPES\REEDER loam 60%

Avg. slope steepness: 7.5 %

Contouring: a. rows up-and-down hill

Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\ Forage Rotations\Alfalfa, 1X; 2 additional years, Z3

Outputs: T value: 3.0 t/ac/yr Soil loss for cons. plan: 0.48 t/ac/yr



## RUSLEZ Frosion Calculation Record

Info: Field 46, W 1/2, Section 35, T 21 N, R 25 E

profiles\Corson Default

## Inputs:

Location: South Dakota\Corson County
Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %

Contouring: a. rows up-and-down hill Strips/barriers: (none) Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs: T value: 3.0 t/ac/yr

Soil loss for cons. plan: 0.17 t/ac/yr



## **South Dakota**

## **RUSLE2 CSP Record**

Info:

Date: June 11, 2013

Name: Wulf Cattle Company

Tract and Field #'s: Field #47A

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%

Slope length (horiz): 350 ft Avg. slope steepness: 2.2 %

Man.	Management	_
1	b.Mullti-year Rotation Templates\Continuous crop dryland rotations\Wheat, spring; Corn, silage; Sunflowers; NT, Z3	

Vegetation	Yield units	Yield (# of units)
Wheat, spring 7in rows	bushels	29.000
Corn, silage	tons	75.000
Sunflower	lbs	1822.0

Adjust res. burial level: Normal res. burial

General yield level: Set by user

**Outputs:** 

T value: 5.0 t/ac/yr

Soil loss for cons. plan: 1.9 t/ac/yr

Soil conditioning index (SCI): 0.05 Avg. annual slope STIR: 10.0

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

## The SCI is the Soil Conditioning Index rating.

> If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.

> If the index is a positive value, soil organic matter levels are predicted to increase under that system.

A positive SCI meets the soil criteria for the Conservation Security Program.

## The STIR value is the Soil Tillage Intensity Rating.

It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation.

> STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.



## **South Dakota**

## **RUSLE2 CSP Record**

Info:

Date: June 11, 2013

Name: Wulf Cattle Company

Tract and Field #'s: Field #47B

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\ShA SHAMBO LOAM, 0 TO 2 PERCENT SLOPES\SHAMBO loam 90%

Slope length (horiz): 400 ft Avg. slope steepness: 1.5 %

Man.	Management
1	b.Mullti-year Rotation Templates\Continuous crop dryland rotations\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Vegetation	Yield units	Yield (# of units)
Wheat, spring 7in rows	bushels	29.000
Corn, silage	tons	75.000
Sunflower	Ibs	1822.0

Adjust res. burial level: Normal res. burial

General yield level: Set by user

**Outputs:** 

T value: 5.0 t/ac/yr

Soil loss for cons. plan: 1.3 t/ac/yr

Soil conditioning index (SCI): 0.10 Avg. annual slope STIR: 10.0

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

## The SCI is the Soil Conditioning Index rating.

If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.

If the index is a positive value, soil organic matter levels are predicted to increase under that system.

A positive SCI meets the soil criteria for the Conservation Security Program.

## The STIR value is the Soil Tillage Intensity Rating.

It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation.

> STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.



## **South Dakota**

## **RUSLE2 CSP Record**

Info:

Date: August 5, 2013

Name: Wulf Cattle Company

Tract and Field #'s: Field #48

Inputs:

Location: South Dakota\Corson County

Soil: Corson, SD soils\VhB VEBAR-COHAGEN FINE SANDY LOAMS, 2 TO 9 PERCENT SLOPES\COHAGEN fine

sandy loam 30%

Slope length (horiz): 800 ft Avg. slope steepness: 2.1 %

Man.	Management
1	a.Single Year/Single Crop Templates\Wheat, spring\Wheat, spring; NT, Z3
2	a.Single Year/Single Crop Templates\Oats\Oats; NT, Z3
3	a.Single Year/Single Crop Templates\Corn, grain\Corn, grain; NT, Z3
4	a.Single Year/Single Crop Templates\Sunflowers\Sunflowers; NT, Z3

Vegetation	Yield units	Yield (# of units)
Wheat, spring 7in rows	bushels	29.000
Oats, spring	bu	61.000
Corn, grain	bushels	75.000
Sunflower	lbs	1822.0

Adjust res. burial level: Normal res. burial

General yield level: Set by user

Outputs:

T value: 2.0 t/ac/yr

Soil loss for cons. plan: 0.35 t/ac/yr

Soil conditioning index (SCI): 0.5 Avg. annual slope STIR: 7.47

Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

## The SCI is the Soil Conditioning Index rating.

If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.

If the index is a positive value, soil organic matter levels are predicted to increase under that system.

A positive SCI meets the soil criteria for the Conservation Security Program.

## The STIR value is the Soil Tillage Intensity Rating.

It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation.

×	STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

Section J: Soil Test Reports



SUBMITTED FOR:

WULF CATTLE CO.

MCLAUGHLIN, SD

## **SOIL TEST REPORT**

142 **FIELD** 

SAMPLE CNTY CARSON

TWP 21-26

SEC

QTR PREV. CROP Wheat-Spring

SO0453

ACRES 0

SUBMITTED BY:

SD WHT GROWERS-MCLAUGHLIN

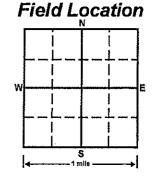
**BOX 640** MCLAUGHLIN, SD

57642



55758 BOX# 3925

REF# 8163509 LAB#



Date Sampled: Date Received: 9/19/2011 11/11/2011 Date Reported:

						receiveu.	L		31	19/207			_	Da	te Reporte	a;			71/11	1/2011
NUTRIEI	NT IN SOIL		INTE	RPR	ETAT	ION		1	st CR	OP CH	DICE		2r	nd CR	ор сного	Έ		3r	d CRO	P CHOICE
		VL	ow I	-ow	Med	High				Dats				Cor	n-Grain				Sun	flower
0-6" 6-24"	34 lb/ac 33 lb/ac								Yie	ld Goal				Yie	ld Goal			Yield Goal		
0-24"	67 lb/ac	****	*   ***	***	*			100 BU 100 BU								2000	Les			
Nitrate								SUGGESTED GUIDELINES SUGGESTED GUIDELINES					SUGGESTED GUIDELINES							
										l/Maint	L .				d/Maint.			Band/Maint,		
Olsen Phosphorus	26 ppm	*****	****	**	*****	*****		LB/A		APPL	ICATION	L	LB/AC		APPLICA	ATION		LB/A		APPLICATIO
Potassium	492 ppm	*****	_	 **	*****	*****		N	33				N	53		······································		N	33	
		<del> </del>	$\dashv \vdash$			]		P <sub>2</sub> O <sub>5</sub>	25		and *	ĮĻ	P <sub>2</sub> O <sub>5</sub>	40	Band		F	205	1B	Band *
0-24" Chloride	28 lb/ac	*****	****	*				K <sub>2</sub> O	10		(Starter)*		K <sub>2</sub> O	10	Band (2		;=	κ <sub>2</sub> 0	0	
0-6" 6-24" Sulfur	24 lb/ac 360 +lb/ac	*****	****	- 11	****	*****		C! S	12 0	ВІО	adcast		CI S	0	Not Ava	llabje		CI S	0	Not Available
Boron		<u> </u>						В					8					В		
Zinc								Zn	]				Zn					Zn		
ron								Fe					Fe				$\mathbb{I}$	Fe		
Manganese							$\parallel \parallel$	Mn					Мл					Mn		
opper	0.71 ppm	*****		<u> </u>	***			Cu	1	Band	(Triai)		Сп	0				Cu	1	Band (Trial)
lagnesium alcium			<u> </u>	<u> </u>				Mg					Mg					Mg		
odium			<u> </u>	<u> </u>	[			Lime					ime				L	ime		
rg. Matter				_	{		Ī		T			7			P. Bass (	Code sout			D	\\
arboriate		<del></del>		╗				Soil pH	But	fer pH	Cation Exchange Capacity				% Base S	7				1
0-6" 6-24"	0.29 mmho/cm 1.4 mmho/cm	*****	*	**	****	***		5.9			Capacity		% C	a	% Mg		% K		% Na	% н

Crop 1: 26 lbs of 0-0-60 = 12 lbs of Chloride\*\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 19AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then

Crop 2: \*\* Chloride yield data is limited for this crop.\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and

Crop 3: \*\* Chloride yield data is limited for this crop.\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and

2/19/2010

Field Location



Soil Analysis by Aqvise Laboratories Northwood: (701) 587-6010 Benson: (320) 843-4109

SUBMITTED FOR: CORSON COUNTY **FEEDERS** 

MCLAUGHLIN, SD 57642

## SOIL TEST REPORT

FIELD 3 SAMPLE 14 CNTY CORSON

TWP 21-27 SECTION 4 QTR **ACRES** 

PREV. CROP Corn-Grain

SUBMITTED BY: SD WHT GROWERS-MCLAUGHLIN

109 ELEVATOR ROAD **BOX 640** MCLAUGHLIN, SD 57642

SO0453

RFF# 8162654 LAB# 2276 BOX# 686

Date Reported:

Date Sampled: 2/15/2010 Date Received 2/18/2010

INTERPRETATION **1ST CROP CHOICE** 2ND CROP CHOICE 3RD CROP CHOICE NUTRIENT IN THE SOIL Low Med High Wheat-Spring Sunflower VLow Corn-Grain 0-6 11 lb/ac YIELD GOAL YIELD GOAL YIELD GOAL 6-24" 27 lb/ac 0-24" 40 BU 2000 LBS 38 lb/ac 100 BU SUGGESTED GUIDELINES SUGGESTED GUIDELINES SUGGESTED GUIDELINES **Hand** Band Band Nitrate LB/ACRE APPLICATION LB/ACRE APPLICATION LB/ACRE APPLICATION Olsen 10 ppm Ν Ν 82 Ν Phosphorus  $P_{2}O_{5}$ 20 Band \*  $P_{2}O_{5}$  $P_{2}O_{5}$ 20 30 Band \* Band \* Potassium 318 ppm K<sub>2</sub>O 10 Band(Starter)\* K<sub>2</sub>O K20 0 10 Band (2x2) 1 0-24 8 lb/ac Chloride Cì 32 Broadcast CI CI 0-61 6 lb/ac s 10 Band 6-24" s 10 Rand s 10 Rand 18 lb/ac Sulfur В В В Boron Zη Zinc Ζn Zn Iron Fe Fe Fe Manganese Mn Mn Mn Copper 0.83 ppm Cu 0 Magnesium Cu 0 Cu 0 Calcium Mg Mg Mg Sodium Lime 0.0 Lime 0,0 Lime Org.Matter Carbonate(CCE) Cation % Base Saturation (Typical Range) Buffer pH Soil pH Exchange 0.13 mmho/cm % Mg % K % H % Ca % Na Capacity 6-24" 0.25 mmho/cm Sol. Salts 6.1

Crop 1: 70 lbs of 0-0-60 = 32 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P205 = 25 K20 = 15 AGVISE Band guidelines will build P & K test levels to the

medium range over many years.

Crop 2: 70 lbs of 0-0-60 = 32 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the

Crop 3: 70 lbs of 0-0-60 = 32 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



## SOIL TEST REPORT

SUBMITTED BY: MZ1154

57647

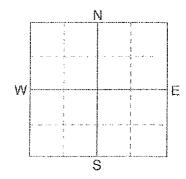
ACRES 222

FIELD ID 4 SAMPLE ID 2A 2B COUNTY CORSON TWP 21N-26E

SECTION 5 QTR

MZB-SDWG-MCLAUGHLIN ZONES ONLY-BRENT

PREV. CROP Corn-Grain



0

REF # 11234894 BOX #

LAB# NW3078

SUBMITTED FOR:

**WULF CATTLE COMPANY** 

Date Sampled 01/19/2012 Date Received 01/23/2012

**BOX 640** 

MCLAUGHLIN, SD

Date Reported 1/24/2012

Nutrient In	The Soil	Interpretation	1	st C	rop Choice	2	nd C	rop Choice	3	rd Cr	op Choice
0-6"	16 lb/a:		To	its	i i	Ва	rley-M	lalting i \$	Su	nflowe	r
6-24"	9 lb/a=			YIE	ELD GOAL		YIE	LD GOAL		YIE	LD GOAL
0-24"	25 lb/ac		100	)	BU	50	********* 26	BU	200	0	LBS
litrate			SUC	GEST	ED GUIDELINES	ຮຸບດ	GEST	ED GÜIDELINES	SUG	GESTE	D GUIDELINES
			В	and/M	aint 🌲	B	and/M	aint. 🔯	В	and/Mi	alot, 🗘
Olsen Phosphorus	9 ppm 👪		LB/A	CRE	APPLICATION	LB/A	CRE	APPLICATION	LB/A	CRE	APPLICATION
Potassium	288 ppm =+1		N	75		N	53	*** (\$ 0 ° 4 ° 4 ° 4 ° 4 ° 4 ° 4 ° 4 ° 4 ° 4 °	N	75	
0-24"	8 lb/ac 🛶		P <sub>2</sub> O <sub>5</sub>	25	Band *	P <sub>2</sub> O <sub>5</sub>	24	Band ♥	P205	21	Band *
hloride			K <sub>2</sub> O,	10	Band (Starter)*	K <sub>2</sub> O	10	Band (Starter)*	K20	0	
0-6" 6-24"	12 lb/ac mass 360 +lb/ac mass		CI	32	Broadcast	Ċ)	32	Broadcast	c)	· Marianes Aran	Not Available
ron			s	0		S	0		S	0	
1C =			В			В		ATTITUDE SAME INCOMES AND A SAME	В		
n			Zn			Zn			Zn		
nganese			Fe			Fe			Fe		
pper gnesium	0.65 ppm		Mn Cu	1	Band (Trial)	/Min Gu	1	Band (Tala)	Mn Cu		B
lcium			Mg		Banu (Triai)	Mg		Band (Trial)	Mg	1	Band (Trial)
dium:			Lime	0		Lime	0		Lime	0	
j.Matter								96 Bare	115	3203000	[ypical Range]
rbonate(CCE)			Soll pl	Buff	ier pH Cation E	xchang	e Cap	acity	% Mg		r
	0.28 mmho/cm   Earles 0.87 mmho/cm   Earles		6.3	<u> </u>							

Crop 1: 70 lbs of 0-0-60 = 32 lbs of Chloride" \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 19 A GVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then

Crop 2: 70 lbs of 0-0-60 = 32 lbs of Chloride" \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 24 K2O = 25 A GVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: \*\* Chloride yield data is limited for this crop. \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 18 K20 = 22 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then



SUBMITTED FOR: CORSON COUNTY **FEEDERS** 

MCLAUGHLIN, SD 57642

## **SOIL TEST REPORT**

SAMPLE 10

FIELD 546 TEASPOONS CNTY CORSON

21-27 SECTION 5

QTR ACRES PREV. CROP Corn-Grain

SUBMITTED BY: SD WHT GROWERS-MCLAUGHLIN 109 ELEVATOR ROAD

**BOX 640** MCLAUGHLIN, SD 57642

TWP

SO0453

REF# 8162650 LAB# 2272 BOX# 620

Field Location

Date Sampled:

2/15/2010

Date Received

2/18/2010

Date Reported:

2/19/2010

		7				3 [				1 12						
NUTRIEN	IT IN THE SOIL	IN	TERP	RETA	TION		IST CR	ОР СН	OICE	2	ND CR	OP CHOICE		31	RD CRO	OP CHOICE
		VLo	w Lov	мMe	dHigh		Whea	t-Sprii	ng		Cor	n-Grain		Sunflower		
0- 6-2	6" 11 lb/ad 4" 18 lb/ad						YIELD GOAL				YIEL	D GOAL		YIELD GOAL		
0-2					#		40 BU				10	0 BU		2000 LBS		
						SUG	SUGGESTED GUIDELINES				GESTE	D GUIDELII	NES	SUGO	ESTE	O GUIDELINES
Nitrate							Band				В	and		<u> </u>	В	and
			LB/ACRE APPLICATION		LB//	LB/ACRE APPLICATION				CRE	APPLICATION					
Olse Phosphorus	n 9 ppm	****	****	1		N	79			N	91		-	N	71	
Potassium	348 ppm	****	<b> </b>	****	****	P <sub>2</sub> O <sub>5</sub>	22	Ba	and *	P <sub>2</sub> O <sub>5</sub>	32	Band *		P <sub>2</sub> O <sub>5</sub>	20	Band *
0-24	." 16 lb/ac	***				K <sub>2</sub> O	10	Band(	Starter)*	K <sub>2</sub> O	10	Band (2x)	2) *	<b>K</b> <sub>2</sub> 0	0	
Chloride 0-6	10.55	****				CI	24	Broa	adcast	CI	**			CI	81	
6-24 Sulfur			**			s	7	Band	(Trial)	s	7	Band (Tri	al)	S	7	Band (Trial)
Boron			╟	<u> </u>		В				В				В		
Zinc						Zn				Zn				Zn		
iron						Fe				Fe		77416		Fe		
Manganese Copper	0.65 ppm	***	****	****	**	Mn				Mn				Mn		
Magnesium	0.00 pp.m					Cu	1	Band	(Trial)	Cu	0			Cu	1	Band (Trial)
Calcium						Mg				Mg				Mg		
Sodium Org.Matter						Lime	0.0	**************************************		Lime	0.0			Lime	0.0	
Carbonate(CCE)				[			<u></u>			7			<u>ا</u> لــــــــــــــــــــــــــــــــــــ	البيييا		
	0.15 mmho/cm	***			-	Soil pl	H ∦Buf	Buffer pH Exchange				% Base Sat		<del></del>		7
	0.19 mmho/cm	***				6.0			Capacity	%	% Ca   % Mg   % I		K	% Na	% H	

Crop 1: 52 lbs of 0-0-60 = 24 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P205 = 25 K20 = 15 AGVISE Band guidelines will build P & K test levels to the

Crop 2: 52 ibs of 0-0-60 = 24 ibs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P205 = 40 K20 = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 52 lbs of 0-0-60 = 24 lbs of Chloride \* Caultion: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



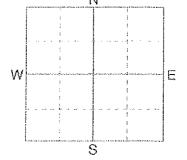
## SOIL TEST REPORT

FIELD ID NW 14:7
SAMPLE ID BEAR SOLDI
COUNTY CORSON
TWP 7 21 R 27

SECTION 6 QTR

ACRES 0

PREV. CROP Corn-Grain



REF #

LAB#

11234889 BOX #

0

NW2572

SUBMITTED FOR:

CORSON COUNTY FEEDERS

SUBMITTED BY: MZ1154
MZB-SDWG-MCLAUGHLIN

ZONES ONLY-BRENT

BOX 640

MCLAUGHLIN, SD

57647

Date Sampled 01/12/2012

Date Received 01/17/2012

Date Reported 1/24/2012

								·········			
Nutrient 1	n The Soil	Interpretation	1	st Cı	op Choice	2	nd C	rop Choice	3	rd Cı	op Choice
0-6 6-24	697		Su	nflowe	(\$	Su	inflowe	raigiagi <b>(†</b> )	W	ieat-Sj	pring
0-24	9 lb/a	C		YIE	LD GOAL		YIE	LD GOAL		YIE	LD GOAL
0-24	17 lb/a		180	0	LBS	200	00	LBS	40		BU
Nitrate		100	SUG	GESTE	D GUIDELINES	suc	GEST	ED GUIDELINES	, suc	GESTE	D GUIDELINES
		1,34,4	Ba	nd	<b>:</b>	B	and	<b>(</b> +)	B	and .	\$ [ <b>\$</b> ]
Olser Phósphorus	14 ppm		LB/A	CRE	APPLICATION	LB/#	ACRE	APPLICATION	LB/A	CRE	APPLICATION
Potassium : 1	350 ppm		'N	73		N	83		- N	91	
			P <sub>2</sub> O <sub>5</sub>	15	Band *	P205	17	Band *	P205	16	Band *
Chloride			K <sub>2</sub> 0	0		K <sub>2</sub> O	0		K <sub>2</sub> O	10	Band (Starter)*
0-6" 6-24" Sulfur	10 lb/ac 24 lb/ac		(C)			ĊĬ			C)		
Bóron		1 1 1	S	7	Band (Trial)	S	7	Band (Trial)	S	7	Band (Trial)
Zinc	0.67 ppm		В		ad N'Al's de de de la company de la la de des des des serviciones	В			В		
Iron :		1 100	Zn	2	Band (Trial)	Zn	2	Band (Trial)	Zn	0	
Manganese			Fe			Fe			Fe		
Copper ,	4		Mn			Mn			Mil		
Magnesium	**************************************	13763171	Cu			Cu			Cu		
Calcium		0.00	Mg			Mg			Mg		
Sodium	P T P SP (SP Backles is in a second s		Lime			Lime			Lime		
Org Matter	3.1 %					J <u></u>		% Rase	Satura	tion (	Typical Range)
arbonate(CCE)	W1990, 500 to		Soil pl	Buff	er pH Cation I	xchang	e Cap	acity % Ca		9.500	% Na % H
0-6" 6-24" Soll Salts	0.17 mmho/cm 0.29 mmho/cm	••••   100 State   100 State	5.8					70 04	/vg	/ V \	70 IVG 7/0 FI

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 16 K2O = 20 A GVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 18 K2O = 22 A GVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 15 A GVI5E Band guidelines will build P & K test levels to the medium range over many years.

## LABORATORIES

Soil Analysis by: Agvise Laboratories Northwood: (701) 587-6010 Benson: (320) 843-4109

SUBMITTED FOR:

WOLFS

MCLAUGHLIN, SD 57642

## SOIL TEST REPORT

FIELD & C-STORE

SAMPLE CNTY

SEÇ

CORSON

TWP

QTR

PREV. CRDP Barley

ACRES 73.3

SO0453

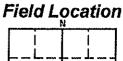
SUBMITTED BY: SD WHT GROWERS-MCLAUGHLIN

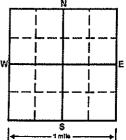
**BOX 640** MCLAUGHLIN, SD

67642

REF# 8163109 LAB#

24526 BOX# 856





Date Sampled: Date Received: 7/15/2011 Date Reported: 7/18/2011

NUTRIENT IN SOIL	INTERPRETATION					si CRC	P CHOICE	2	nd CR	OP CHOICE	3	3rd CROP CHOICE			
	VLow	Low	Med	High		(°i0).	ine) ilin			10		White	(Signie		
5 lb/ac 12 ib/ac 17 lb/ac							O'SEL		W-1250-149	reed and	No Security	(d)			
S10-j1					300	Çilli	e@gestikis: WWw.			o/GDIGENINES		Esturi	y Gulfda (juga		
Silv. 13 ppm						F		LOVA	Pla	APRUCATION		ole E			
357 ppm						44	Band *		83 25	Band *		91 25	Band *		
l silo co						10	Вапо (2х2)		10	Band (Starter)*		10	Band (Starter)*		
24 lb/ac 42 lb/ac						7	Band (Trial)		7	Band (Trial)		7	Band (Trial)		
													Dalla (TITAL)		
0.61 ppm				·		0			2	Band (Trial)		0			
						_									
											000				
						0			0			0			
9.01/9.101. 2.7 %															
					e opravl	ii G						TO LOCAL			
0.24 mmho/cm 0.39 mmho/cm					6,0										

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 44 K2O = 30AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

25 K2O = 19AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

25 K2O = 19AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



SUBMITTED FOR:

CORSON COUNTY FEEDERS

MCLAUGHLIN, SD 57642 SOIL TEST REPORT

TRANSFORMERS

SAMPLE 1

CORSON

TWP 21-27

7

QTR 300.1

ACRES 0

PREV. CROP Wheat-Spring

SUBMITTED BY:

SO0453

SD WHT GROWERS-MCLAUGHLIN

BOX 640 MCLAUGHLIN, SD

57642

SEC

....

REF# 8163137 LAB#

Field Location

S

42511 BOX# 2534

Date Sampled: Date Received: 9/8/2011 Date Reported: 9/9/2011

NUTRIENT IN SOIL	IN	TERPR	ETATIO	ON		st CRC	ор сноксе	21	nd CR0	OP CHOICE	3	rd CRC	ор сноісе
	VŁow	Low	Med	High		<sup>2</sup> Cia	itte ja ja		, Gol	i Gellii		Siti	(lovers#
16 lb/a 12 lb/a	c					jj.	rjenii .		W-100	Good Co.			in Stell
28 lb/a	c III					(1)	egire e			iju.		1000	0115
Nit (c				1	5066		CODE OF ES	Sice	i Sini	, elujojejų (lak			CONDUCTOR
						Finite	Military (		Bijfo	Major 2			
17 ррп		70.TY	na Air				ARESIGATION			ARRIGIGAÇÃO			AP ELICATION
289 ppm						92 40	Band *		116			72	
						10	Band (2x2) *		10	Band * Band (2x2) *		18	Band *
Ø1lGGG										24/14 (2/12)			
6 lb/ac						12	Band		12	Band		12	Band
			និងប្រ. មកភា 🗘										
0.51 ppm						2	Band		2	Band		2	Band (Trail)
Manager State Stat													
												_	
						0			     0			0	
2.8 %									JL			SIEO P	
2.0 %										//BuselSelval	ontryonal		
0.34 mmho/cm 0.3 mmho/cm													
Crop 1: Couries Sand Florad File					6,5								

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 48 K2O = 32AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



SUBMITTED FOR: **CORSON COUNTY** FEEDERS

MCLAUGHLIN, SD 57642

## **SOIL TEST REPORT**

FIELD 10411 CNTY CORSON

SAMPLE 7

TWP 21-27 QTR

SECTION 8 ACRES

PREV. CROP Corn-Grain

SUBMITTED BY:

SD WHT GROWERS-MCLAUGHLIN 109 ELEVATOR ROAD

**BOX 640** MCLAUGHLIN, SD 57642

SO0453

REF# 8162647

Field Location

LAB# 2269 BOX# 622

Date Sampled:

2/15/2010

Date Received:

2/18/2010

Date Reported:

2/19/2010

MUTDIEM	T IN THE SOIL	in	TERP	RET	ATIO	N						21	ID CR	OP CHOICE	=	;	RD CR	OP CHOICE
NOTHIEL	I IN THE SOIL	VL	w Lo	w M	ed Hi	gh		Whea	t-Sprin	ıg			Corr	ı-Grain			Sui	nflower
0- 6- <b>2</b>	- ]] (0.10/00			┪	╗			YIEL	D GOA	L			YIELI	GOAL			YIEL	D G <b>O</b> AL
0-24			***					4	0 BU			i de la composição de l	10	0 BU			200	0 LBS
							SUG	GESTE	D GUID	ELINES		SUGG	ESTE	GUIDELI.	NES	SUG	GESTE	D GUIDELINES
Nitrate						Î		В	and	******			В	and			E	land
						Ĭ	LB/A	CRE	APPL	ICATION		LB/A	CRE	APPLICA'	TION	LB	ACRE	APPLICATION
Olse Phosphorus	n 19 ppm	****	****	***	* ***	7	N	48				N	60			N	40	
Potassium	342 ppm	****	****	***	* ***	7	P <sub>2</sub> O <sub>5</sub>	15	Band(	Starter)*		P <sub>2</sub> O <sub>5</sub>	15	Band (2x	2) *	P <sub>2</sub> O <sub>5</sub>	12	Band *
0-24	" 12 lb/ac	***					K <sub>2</sub> O	10	Band(	Starter)*		K <sub>2</sub> O	10	Band (2x	2) *	K <sub>2</sub> O	0	
Chloride 0-6		****		<u> </u>		╝	CI	28	Broa	dcast	ĺ	CI	**			CI	**	
6-24		****	***				S	7	Band	(Trial)	Ì	s	7	Band (Tr	ial)	s	7	Band (Trial)
Sulfur Boron			4_	lacksquare	<u> </u>		В				ľ	В	***************************************			В		
Zinc	<u> </u>		╬	╫┈	┢	4	Zn				Ī	Zn				Zn		
iron						ا[	Fe			i	ľ	Fе		<u> </u>		Fe		
Manganese	<u> </u>	****				֡֞֞֞֞֞֞֩֞֩֞֩֞֩֜֡֡֡֞֜֞֜֡֡֡֞֜֞֡֡֡֡֡֡֡	Mn		-		F	Mn				Mn	1	
Copper Magnesium	0.65 ppm	****	****	****	**	4	Cu	1	Band	(Trial)	ŀ	Cu	0			Cu	1	Band (Trial)
Calcium	<del></del>		╬	}	╁	4	Mg				ŀ	Mg	<u> </u>			Mg	<del>                                     </del>	56.14 (7714)
Sodium			╫	i	Ť	1	Lime	0.0	wa		Ļ	<del></del> _			{	<del></del>	-	
Org.Matter						֓֞֝֞֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓	Line	0.0			L	Lime	0.0			Lime	0.0	
Carbonate(CCE)						] [	Soil pi	J	ffor nll	Cation			1	% Base Sa	turatio	оп (Тур	ical Rai	ige)
0-6" 6-24"	0.36 mmho/cm 0.33 mmho/cm	****	**				- Son pi	n Bu	ffer pH	Exchang Capacity		% (	Ca	% Mg	%	К	% N	9 %H
Sol. Salts	0.33 mmno/cm		17		L		6.8											

Crop 1: 61 lbs of 0-0-60 = 28 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 61 lbs of 0-0-60 = 28 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P205 = 40 K20 = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 61 lbs of 0-0-60 = 28 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



SUBMITTED FOR:

CORSON COUNTY FEEDERS

MCLAUGHLIN, SD 57642

## SOIL TEST REPORT

FIELD **AIRPORT** 12413

SAMPLE

CORSON

TWP SEC

21-27

QTR

PREV. CROP Wheat-Spring

ACRES 0

SUBMITTED BY: SO0453

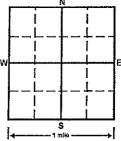
SD WHT GROWERS-MCLAUGHLIN

MCLAUGHLIN, SD

57642

REF# 8163141 LAB# 42528 BOX# 2576

Field Location



Date Sampled: Date Received: 9/8/2011 Date Reported: 9/9/2011

NUTRIENT IN SOIL	INT	ERPRETA	TION		si CRC	P.CHOICE	2	id CR(	OP CHOICE	3	d CRG	P CHOICE
	VI.0%	Low Med	High		Con	i-Grain		Con	i-Grain		Sun	flower
0-6 29 lb/ac 6-24 36 lb/ac					Yiel	d Goal		Yiel	d Goal		Yiel	d Goal
0°24' 65 lb/ac		****			100	BU		120	BU		2000	LBS
Nirate				SUGG	ESTEC	GUIDELINES	SUGG	ESTEC	GUIDELINES	sugg	ESTEC	GUIDELINES
					Band	/Maint.		Band	I/Maint		Band	/Maint.
Cisen 11 ppm				LB/A0	CRE	APPLICATION	LB/A	CRE ;	APPLICATION	, LB/A	CRE	APPLICATION
Phosphorus  Potassium  248 ppm				N	55		N.	79		SN.	35	
Potassium 248 ppm				P <sub>2</sub> O <sub>5</sub>	40	Band *	P <sub>2</sub> 0 <sub>5</sub>	48	Band *	P <sub>2</sub> O <sub>5</sub>	19	Band *
Chlonde				X20	27	Band *	K <sub>2</sub> O	32	Band *	.K <sub>2</sub> O	22	Band *
0-6" 104 lb/ac				CI-			OI.			Ĉ)		
6-24* 66 lb/ac		****	*****	S	0		S	0		S	0	
Boron				В			8			В		
Zińc 0.84 ppm		***   ***		Zn	0		Zn	0		žn.	2	Band (Trial)
lion 3				Fe			Fe			Fe		
Copper				Mo.	[		Mn			Δn		
Magnesium				Cu   Mg	][ ][		Çü			Ca Vg		
Calcum				Lime	0		Mo	0	J	10000000000	0	
Sodjum							Lime			Lime	الــــــــــــــــــــــــــــــــــــ	
Org Matter 3.5 %	*****	**		Soil pH	Büf	Cation er pH Exchange			% Base Saturati	on(Typical	Range	
Carconate 0.5 mmho/cm	HANNE FARE	es les				Capacity	% c	а	% Mg 🗼 8	ĸ	% Ňa	%Н
Soll Salts 0.36 mmho/cm	••••• ••• •••			6,6							****	

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soif tests.Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 48 K2O = 32AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



## SOUTESTREPORT

14415 FIELD ID SAMPLE ID 27 COUNTY CORSON

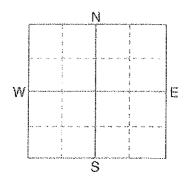
TWP 22-27 SECTION 9

QTR

SUBMITTED BY: S00453

ACRES 0

PREV. CROP Sunflower



REF # LAB #

11234718 BOX #

NW180933

0

SUBMITTED FOR:

**CORSON COUNTY FEEDERS** 

109 ELEVATOR ROAD **BOX 640** 

SD WHT GROWERS-MCLAUGHLIN

MCLAUGHLIN, SD

57642

Date Sampled

Date Received 12/12/2011

Date Reported 1/17/2012

Nutrient In		rjar edda Decma	1st C	rop Choice	2	nd C	rop Choice	3	d (e	op Choice
0-6' 6-24'	21 lb/ac		Vheat-S	pring (1¢)	00	orn-Gra	610 <u>(</u> \$ )	Oa	is .	
0524	15 lb/a¢		YTE	ELD-GOAL		YIE	LD GOAL		YIE	LD GOAL
0-24"	36 lb/ae	4	) Desiron	BU	100	)	BU	100		BU
Nitrate		Si	IGGEST	ED GUIDELINES	SUC	GEST	ED GUIDELINES	5UG	GEST	ED GUIDELINES
			Band		В	and	•	FB	àndi	] <b>÷</b>
Olsen Phosphorus	aritistis mag 8	LB	ACRE	APPLICATION	ĿB/	ACRE	APPLICATION	LB/A	CRE	APPLICATION
Potassium a	381 ppm i=====:		72		N	84	The second secon	N.	64	
0-24"	28 lb/ac	P20	23	Band *	P205	35	Band *	P205	26	Band *
Chloride S <sub>fi</sub>		1 1 1 1 1 X20	10	Band (Starter)*	K50	10	Band (2x2) *	K20	10	Band (Starter)*
0-6' 6-24'	24 lb/ac ====================================		12	8roadcast	CL		Not Available	iCI:	12	Broadcast
Sulfur Boron		rada T	0		S	0		ι δ	0	
Zinc		В.			В			8		
Iron de des		Zn			Zn 1			-Zn		
Manganese					Fe			#Fe		
Copper	0.69 ppm				Mn		**************************************	Mn		haladad halim mayangan ga pengangangan dalahada kala basabada da spenjang
Magnesium Galcium		Cu	1	Band (Trial)	Cu	0		Cu	1	Band (Trial)
Sodlum 4		Mg			Mg:			Ng .		
Org Matter		Lime	0		Lime'	0		Lime	0	
arbonate(CGE)		5oll	H Buf	fer pH Cation Ex	chang	e Cap	acity			Typical Range)
	.35 mmho/cm	######### 6.4					% Ca	% Mg	% K	% Na % H
ol, Salts						·····				

Crop 1: 26 ibs of 0-0-60 = 12 ibs of Chloride" \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 A GVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: \*\* Chloride yield data is limited for this crop. \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 40 K20 = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 26 lbs of 0-0-60 = 12 lbs of Chloride" \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 19 A GVISE Band guidelines will build P & K test levels to the medium range over many years.



SUBMITTED FOR: CORSON COUNTY **FEEDERS** 

MCLAUGHLIN, SD 57642

## SOIL TEST REPORT

FIELD 16 CNTY

SAMPLE 3

TWP QTR CORSON 22-27

SECTION 10

ACRES

PREV. CROP Corn-Grain

SUBMITTED BY:

SD WHT GROWERS-MCLAUGHLIN 109 ELEVATOR ROAD

**BOX 640** MCLAUGHLIN, SD 57642

SO0453

REF# 8162663

LAB# 2500 BOX# 679

Field Location

Date Sampled:

2/24/2010

Date Received:

3/1/2010

Date Reported:

3/2/2010

						51 1										
NUTRIEN	T IN THE SOIL	IN	(ERP	RETA	TION		ST CR	OP CHOICE		2	ND CR	OP CHOICE		31	RD CRO	OP CHOICE
	() 12 00/2	VLo	w Lo	v Me	dHigh		Cor	n-Grain			Whea	t-Spring			Sun	flower
0-l 6-2-				1			YIELI	GOAL CO	~-		YIELI	GOAL			YIELI	GOAL
0-24			***		Í		10	0 BU			4(	) BU			200	0 LBS
	Ĭ				1	SUG	GESTE	O GUIDELIN	IES	SUG	SESTE	O GUIDELIN	IES	SUGO	ESTE	GUIDELINES
Nitrate							В	and		***************************************	В	and			В	and
						LB/	ACRE	APPLICAT	ION	LB/A	CRE	APPLICAT	NOI	LB/A	CRE	APPLICATION
Olse Phosphorus	n 42 ppm	****	****	****	****	N	52			N	40			N	<b>3</b> 2	
Potassium	600 ppm	***	****	****	****	P <sub>2</sub> O <sub>5</sub>	15	Band (2x2	) *	P <sub>2</sub> O <sub>5</sub>	15	Band(Start	er)*	P <sub>2</sub> O <sub>5</sub>	10	Band(Starter)*
0-24	" 48 lb/ac	****	****	****		K <sub>2</sub> O	10	Band (2x2	) *	K <sub>2</sub> O	10	Band(Start	er)*	K <sub>2</sub> O	0	
Chloride 0-6		****	<u> </u>	<u> </u>		Ci	0			CI	0			CI	0	
6-24		II II	****	**		s	5	Band (Tria	d)	S	5	Band (Tria	al)	S	5	Band (Trial)
Sulfur		<b> </b>	<u> </u>	<u> </u>		В				В				В		
Zinc		╟─	╟	<u></u>		Zn				Zn				Zπ		
Iron						Fe				Fe		<u> </u>	_	Fe		
Manganese		***				Mn				Mn				Мπ	***************************************	
Copper Magnesium	0.78 ppm	****	****	****	****	Cu	0			Cu	1	Band (Tria	3))	Cu	1	Band (Trial)
Calcium				$\vdash$		Mg				Mg			-	Mg		(11,00)
Sodium						Lime	0.0	-		Lime	0.0			Lime	0.0	
Org.Matter Carbonate(CCE)								- γ		1	<u></u>			<u> </u>		
	0.45 mmho/cm	****	***			Soil p	H ∥Bui	Ca fer pH Exc	ation hange	e		% Base Sat		<del></del>		
6-24"		****	**			<u> </u>	_ -	Ca	pacity	/ %	Ca	% Mg	%	K	% Na	% н
Sol. Salts		L				7.1										

Crop 1: \*Caution: Seed Placed Fertilizer Can Cause Injury \* No credits have been given for applied manure. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test

levels to the medium range over many years.

Crop 2: \* Caution: Seed Placed Fertilizer Can Cause Injury \* No credits have been given for applied manure. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test

Crop 3: \* Caution: Seed Placed Fertilizer Can Cause Injury \* No credits have been given for applied manure. Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidalines will build P & K test levels to the medium range over many years.

2/19/2010



Soil Analysis by <u>Agvise Laboratories</u> Northwood: (701) 587-6010 Benson: (320) 843-4109

2/15/2010

SUBMITTED FOR: **CORSON COUNTY FEEDERS** 

MCLAUGHLIN, SD 57642

Date Sampled:

## SOIL TEST REPORT

17 FIELD SAMPLE 18 CORSON CNTY TWP 21-26 SECTION 13 QTR ACRES

Corn-Grain

SUBMITTED BY: SD WHT GROWERS-MCLAUGHLIN 109 ELEVATOR ROAD

Date Received:

**BOX 640** MCLAUGHLIN, SD 57642

PREV. CROP

Field Location

8162658 REF# LAB# 2280

Date Reported:

BOX# 622

2/18/2010

SO0453

			I						·····							
		INT	ERPR	ETAT	ION	1	ST CR	OP CHC	ICE		ND CR	OP CHOICE		3F	O CRC	P CHOICE
NUTRIEN	IN THE SOIL	VLov	Low	Med	High		Whea	t-Sprin	g		Cori	n-Grain			Sun	fiower
0-6			╏	┢			YIEL	O GOAL	-		YIEL	) GOAL			YIEL	GOAL.
6-24 0-24			***				40	BU		<b></b>	10	0 BU			200	) LBS
						SUG	GESTE	O GUID	ELINES	SUG	GESTE	O GUIDELIN	NES	SUGO	SESTE	GUIDELINES
\$ 154ma4m	#						В	and			В	and		ļ	В	and
Nitrate						LB/	CRE	11	CATION	LB	ACRE	APPLICAT	ION	LB/A	CRE	APPLICATION
Olsei	20 ppm	****	****	****	****	N	48			N	60			N	40	
Phosphorus		<u> </u>				P <sub>2</sub> O <sub>5</sub>	15	Bandi	Starter)*	P <sub>2</sub> O	15	Band (2x2	 2\ *	P <sub>2</sub> O <sub>5</sub>	12	Band *
Potassium	376 ppm	****	****	****	***	<u> </u>	13	Danuc	starter)	<b> </b>		<u> </u>		ļ	'*	Daily
0-24	4 lb/ac	**				K <sub>2</sub> O	10	Band(	Starter)*	K <sub>2</sub> O	10	Band (2x2	2) *	K <sub>2</sub> O	0	
Chioride						CI	36	Broa	dcast	CI	**			CI	**	
0-6' 6-24'		****	***			S	7	Band	(Trial)	s	7	Band (Tri	al)	S	7	Band (Triai)
Sulfur						В				В				В		
Boron						<b></b>	<u> </u>			<b> </b>	<del></del>			Zn	L	
Zinc				<u></u> ]		Zn	ļ			Zn	<u> </u>			211		
iron						Fe			- 1	Fe				Fe		ļ
Manganese						Mn				Mn	1			Mn		
Copper	23.89 ppm	****	****	****	***	Cu	0			Cu				Cu	0	
Magnesium						<u></u>	U			Cu	<u> </u>		···			<u> </u>
Calcium						Mg				Mg	<u></u>			Mg		
Sodium						Lime	0.0			Lime	0.0			Lime	0.0	
Org.Matter		<u>                                     </u>	[									L		ييــــــــــــــــــــــــــــــــــــ		
Carbonate(CCE)						Soils	ມ ∥₀	ffor nU	Cation	اٰہ		% Base Sa	turatio	on (Typi	cai Ran	ge)
0-6" 6-24"	0.39 mmho/cm 0.35 mmho/cm	****	***	Ĭ		Soil pH Buffer pH Exchang Capacit					Ca	% Mg	%	K	% Na	з % Н
Sol. Salts	U.SS HANITO/CIII					7.2										

Crop 1: 79 lbs of 0-0-60 = 36 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P205 = 25 K20 = 15 AGVISE Band guidelines will build P & K test levels to the

medium range over many years.

Crop 2: 79 lbs of 0-0-60 = 36 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the

medium range over many years.

Crop 3: 79 lbs of 0-0-60 = 36 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



SUBMITTED FOR: **CORSON COUNTY FEEDERS** 

MCLAUGHLIN, SD 57642

## SOIL TEST REPORT

18+19 FIELD CORSON CNTY TWP 22-27

SAMPLE 5 SECTION 15

**ACRES** 

QTR PREV. CROP Corn-Grain

SO0453 REF# 8162665

LAB# 2496 BOX# 681

Field Location

SUBMITTED BY: SD WHT GROWERS-MCLAUGHLIN 109 ELEVATOR ROAD

**BOX 640** MCLAUGHLIN, SD 57642

Date Sampled:

2/24/2010

Date Received:

3/1/2010

Date Reported:

3/2/2010

NII	TRIEN	T IN THE SOIL		INI	[ERP	RET	ΑTI	ION						21	ND CR	DP'CHOICI	E	3	RD CR	OP CHOICE
	IIII	I IN THE SOIL	j	VLO	w Lov	v M	ed	High		Co	rn-Grai	n			Whea	t-Spring			Sun	flower
	0-0 6-24	-			╁		ij			YIE	D GOA	\L			YIELI	GOAL			YIELI	GOAL
	0-24			***			ĺ			1	00 BU		اا		4(	BU		-	200	0 LBS
							1		SUG	GEST	D GUII	DELINES		SUGG	GESTE	O GUIDELI	NES	SUG	GESTE	O GUIDELINES
Nitrate										····	Band				В	and		<b> </b>	В	and
									LB/	ACRE	APPL	.ICATION		LB/A	CRE	APPLICA:	TION	LB/	ACRE	APPLICATION
Phospho	Olse	n 14 ppn	7	****	****	***	7	***	N	90				N	78			N	70	
Potassiu	~~~	294 ppn	╢	****	****	***	٦,	****	P <sub>2</sub> O <sub>5</sub>	16	В	and *		P <sub>2</sub> O <sub>5</sub>	15	Band(Star	ter)*	P <sub>2</sub> O <sub>5</sub>	16	Band *
	0-24	" 56 lb/ad		***	****	***	, ,	***	K <sub>2</sub> O	10	Band	i (2x2) *		K <sub>2</sub> O	10	Band(Star	ter)*	К₂О	o	
Chloride					<u> </u>	L	Ļ		CI					Cł	٥			CI	0	
	0-6' 6-24'			****	***	*			S	7	Bani	d (Trial)		s	7	Band (Tr	ial)	S	7	Band (Trial)
Sulfur Boron				ļ	<u> </u>	<u> </u>	1	_	В					В				В		
Zinc	<del></del>	<del> </del>	╢		-	┢	╬		Zn		ĺ			Zn				Zn		
Iron			]]			<b> </b>	Ť	╗	Fe				╠	Fe	<u> </u>			Fe	<u> </u>	
Mangane	se						Ī		Mn	╫	╫		ĺŀ	Мп				Mn		
Copper		0.57 ppm		****	****	***			Cu	<u> </u>								<del> </del>	ļ	
Magnesiu Calcium	ım	<u> </u>	∭			<u> </u>	Ļ	_	<u> </u>	0	<u> </u>			Cu	1	Band		Cu	1	Band (Trial)
Sodium		<u> </u>	∭		<u> </u>		Ļ	_	Mg		<u> </u>		Ĺ	Mg				Mg		
Org.Matte	r		╢			<u></u>	╬		Lime	0.0			L	Lime	0.0			Lime	0.0	
Carbonate			╬			-	╬	-				Cation	1	ī		% Base Sa	turatio	n /Tvni	cal Ran	ne)
		0.25 mmho/cm 0.29 mmho/cm	II II	****	*		ľ		Soil p	Н В	ıffer pH	Exchang Capacit	ge	%		% Mg		K	% Na	
Sol. Salts		o.29 minio/Cm					L		6.4											

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \* No credits have been given for applied manure. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test

levels to the medium range over many years.

Crop 2: \* Caution: Seed Placed Fertilizer Can Cause Injury \* No credits have been given for applied manure. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test

Crop 3: \* Caution: Seed Placed Fertilizer Can Cause Injury \* No credits have been given for applied manure. Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



SOIL TEST REPORT

Soil Analysis by <u>Agvise Laboratories</u> Northwood: (701) 587-6010 Benson: (320) 843-4109

SUBMITTED FOR: **CORSON COUNTY** 

MCLAUGHLIN, SD 57642

**FEEDERS** 

FIELD SAMPLE 4 CNTY CORSON TWP 22-27 SECTION 16 QTR **ACRES** 

PREV. CROP Corn-Grain

SUBMITTED BY: SD WHT GROWERS-MCLAUGHLIN 109 ELEVATOR ROAD

**BOX 640** MCLAUGHLIN, SD 57642

SO0453

REF# 8162664 LAB# 2501 BOX#

Field Location

Date Sampled: 2/24/2010 Date Received:

3/1/2010

Date Reported:

3/2/2010

NUTRIEN	T IN THE SOIL	IN	FERP	RETA	MOIT		ST CR	OP CHO	OICE		2ND CR	OP CHOIC	E	31	RD CRO	P CHOICE
		VLo	w Lov	w Me	d High		Cor	n-Grain	1		Whe	at-Spring			Sun	flower
0- 6-2							YIEL	D GOA	L		YIEL	D GOAL			YIELI	GOAL
0-2-			**				10	0 BU			4	0 BU			200	D LBS
				1		SUG	GESTE	D GUID	ELINES	SU	GGESTE	D GUIDELI	NES	SUGO	SESTE	GUIDELINES
Nitrate							В	and		F	E	Band		ļ	В	and
						LB/	ACRE	APPL	ICATION	LE	/ACRE	APPLICA	TION	LB/A	CRE	APPLICATION
Olse Phosphorus	n 22 ppm	***	****	****	****	N	76			N	64			N	56	
Potassium	389 ppm	****	****	****	****	P <sub>2</sub> O <sub>5</sub>	15	Band	(2x2) *	P <sub>2</sub> C	5 15	Band(Star	ter)*	P <sub>2</sub> O <sub>5</sub>	10	Band(Starter)*
0-24	" 24 lb/aç	****	***			K <sub>2</sub> O	10	Band	(2x2) *	K <sub>2</sub> (	10	Band(Star	ter)*	K <sub>2</sub> O	0	
Chloride	<u> </u>			<u> </u>	<u> </u>	CI	**			CI	16	Broadca	ıst	CI	**	
0-6 6-24 Sulfur		***	***			S	7	Band	l (Trial)	s	7	Band (Tr	ial)	S	7	Band (Trial)
Boron		II	╬	<u> </u>		В				В				В		
Zinc						Zn				Zn				Zn		
Iron						Fe				Fe				Fe		
Manganese Copper		***	****	****		Mn				Mn				Mn		
Copper Magnesium	0.65 ppm			****	**	Cu	0		][	Cu	1	Band (Tri	ai)	Cu	1	Band (Trial)
Calcium	1					Mg				Mg	1			Mg		( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (
Sodium						Lime	0.0				0.0					
Org.Matter						Line	0.0			Lime	. 0.0			Lime	0.0	
Carbonate(CCE)	( <u> </u>					Soil p	н   В.,	ffer pH	Cation Exchang			% Base Sa	turatio	л (Турк	al Ran	ge)
	0.32 mmho/cm 0.25 mmho/cm	****	**			50.17		p. 1	Capacity		6 Ca	% Mg	%	к	% Na	% H
Sol. Salts						6.7	#	į								

Crop 1: 35 lbs of 0-0-60 = 16 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* No credits have been given for applied manure. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 35 ibs of 0-0-60 = 16 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* No credits have been given for applied manure. Crop Removal: P2O5 = 25 K2O = 15 AGVISE

Crop 2: 35 lbs of 0-00 = 10 lbs of chloride = Caution: Seed Placed Fertilizer Can Cause Injury \* No credits have been given for applied manure. Crop Removal: P205 = 18 K20 = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



SUBMITTED FOR: CORSON COUNTY **FEEDERS** 

MCLAUGHLIN, SD 57642

## SOIL TEST REPORT

FIELD 21 CNTY CORSON TWP

57642

SAMPLE 6

22-27 QTR

SECTION 19 **ACRES** 

PREV. CROP Corn-Grain

SUBMITTED BY:

SD WHT GROWERS-MCLAUGHLIN 109 ELEVATOR ROAD **BOX 640** MCLAUGHLIN, SD

SO0453

REF# 8162646 LAB# 2268

622

BOX#

Field Location

Date Sampled:

2/15/2010

Date Received

2/18/2010

Date Reported:

2/19/2010

NUTRIEN	IT IN THE SOIL		INT	ERP	RETA	TION		IST CR	OP CH	OICE		21	ID CRO	P CHOICI	E		RD CR	OP CHOICE
		ı	VLow	Lov	v Med	High		Whea	at-Sprir	19			Corn	ı-Grain			Sur	flower
0- 6-2	6" 10 lb/s			1	╫	1		YIEL	D GOA	L			YIELD	GOAL			YIEL	D GOAL
0-2			***		}	# .		4	0 BU			*********	100	) BU			200	0 LBS
				1			SUG	GESTE	D GUIC	ELINES		SUGG	ESTE	GUIDELI	NES	SUG	GESTE	D GUIDELINES
Nitrate			 					E	and				Bi	and			<del> </del>	and
							LB/	ACRE	APPL	ICATION		LB/A		APPLICA	TION	LB/	ACRE	APPLICATION
Olse Phosphorus	n 9 ppr	٦	****	****	**		N	80			ř	N	92		_	N	72	
Potassium	296 ppn	,	****	****	****	****	P <sub>2</sub> O <sub>5</sub>	22	Ва	and *		P <sub>2</sub> O <sub>5</sub>	32	Band	*	P <sub>2</sub> O,	20	Band *
0-24	" 28 fb/ac		***	***			K <sub>2</sub> O	10	Band(	Starter)*	ľ	κ <sub>2</sub> 0	10	Band (2x	2) *	К <sub>2</sub> 0	0	
Chloride							CI	12	В	and		CI	**	<u></u>		CI	**	
0-6 6-24		, 23 JA	1 11	***			s	7	Band	(Trial)	F	s	7	Band (Tr	ial)	s	7	Band (Trial)
Sulfur Boron		╢					В				ľ	В				В	Ť	
Zinc		╫					Zn				ľ	Zn				Zn	<b>-</b>	
Iron		╢					Fe				۲	Fe			一	Fe	1	
Manganese							Mn		<del></del>		╠					<u> </u>	╁──	
Copper	0.57 ppm		****	****	***						L	Mn		-2-2		Mn	<u> </u>	
Magnesium							Cu	1	Ba	nd	L	Cu	0			Cu	1	Band (Trial)
Calcium		$\prod_{i}$					Mg			l	ľ	Mg				Mg		
Sodium Org.Matter	<b></b>	<u></u> ∦L					Lime	0.0			ī	ime	0.0			Lime	0.0	
Carbonate(CCE)						_		يسيا		السيا	<u></u>	<u></u>			<u></u>	<u> </u>	JL	
0-6"	0.2 mmho/cm		**	_			Soil p	H ∦Bu:	fer pH	Cation Exchang				6 Base Sa	turatio	n (Typ	ical Rar	ge)
	0.28 mmho/cm	111	***				<u> </u>	_ _		Capacity		% C	a	% Mg	%	к	% Na	% Н
ol. Salts		İĹ					6.3	ļļ	ĺ		i							

Crop 1: 26 ibs of 0-0-60 = 12 ibs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P205 = 25 K20 = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years. Crop 2: 26 lbs of 0-0-60 = 12 ibs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the

medium range over many years. Crop 3: 26 lbs of 0-0-60 = 12 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P205 = 18 K20 = 22 AGVISE Band guidelines will build P & K test levels to the

medium range over many years.



Soil Analysis by: Agvise Laboratories Northwood: (701) 587-6010

Benson: (320) 843-4109

SUBMITTED FOR:

WOLF

0.6"

6-24

0.24 mmho/cm

1.08 mmho/cm

## SOIL TEST REPORT

FIELD 22. SAMPLE 6

CNTY CORSON TWP

22-27 30

QTR SE

ACRES 0

PREV. CROP Oats

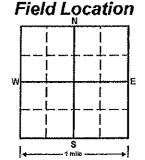
SUBMITTED BY:

SO0453

SD WHT GROWERS-MCLAUGHLIN **BOX 640** 

MCLAUGHLIN, SD 57642

REF# 8164774 LAB#



25619 BOX# 920

Date Sampled: 7/21/2011 Date Received: 7/25/2011 Date Reported; 7/26/2011

<u> </u>					i	L								
NUTRI	ENT IN SOIL	Visio	NTERF	RETAT	TON High			OP CHOICE			DP/CHOICE			DP: GHOICE
0-6" 6-24"	10 lb/ac 18 lb/ac	11116/06/06/06/06		20 98882400			Yle	ld Goal	1	Yiel	d Goal		Yiel	d Goal
0-24	28 lb/ac						4(	0 BU		40	BU		110	BU
Nitrate						şugg	ESTE	D GUIDELINES	SUGG	ESTE	GUIDELINES	SUGG	ESTEC	GUIDELINES.
100							Ban	d/Maint.		Band	l/Maint.		Band	I/Maint.
Olsen	19 ppm	*****				LB/A	CRE	APPLICATION	LB/A	CRE	APPLICATION	LB/A	CRE	APPLICATION
Phosphorus	ta bbiii					N	34		N.	80	Supplied to the supplied of th	N	104	
Potassium	347 ppm	*****	*****	******		P <sub>2</sub> O <sub>5</sub>	19	Band *	P <sub>2</sub> O <sub>5</sub>	25	Band *	P <sub>2</sub> O <sub>5</sub>	44	Band *
0-24" Chloride	20 lb/ac					K <sub>2</sub> 0	10	Band (Starter)*	κ₂0	10	Band (Starter)*	K,0	10	Band (2x2) *
0-6" 6-24" Sulfur	8 lb/ac 360 +ib/ac	*****				Ci S	20 0	Broadcast	CI S	20	Broadcast	CI S	0	Not Available
Baron	0.5 ppm		 			В	0		В	0		В	0	
Zinc	1.47 ppm	*****		*****		2n	0		Zn	0		Zn	0	
Iron	44.1 ppm	*****				Fé	0		Fe	0		Fe	0	
Manganese	9.0 ppm	*****		*****		Mn	0		Mn	0		Mn	0	
Copper	0.67 ppm		******	•••		Cu	1	Band (Trial)	Cu	1	Band (Trial)	i co	0	
Magnesium	704 ppm			******		Mg	0		Mg	0		Mg	0	
Calcium	2327 ppm	*****	*****	*****	*****	Lime	0		Lime			Lime	0	
Sodium	33 ppm	4					20 0	entraced survey				{ 2233	}	
Org. Matter	3.2 %	*****	*****			Soll.pH	Bu	Cation ffer pH Exchange			% Base Saturat	on(Typical	Range	1
Carbonate	0.0 %							Capacity		a l	%Mg	6.K	% Na	%н
0.6	0.24 mmbolom	<b>*************************************</b>	27 B 3 3 3 3	20 VARIABLE (1970)	HOWERS	1227.500	33 B33		21 EXCESS 6	\$50 as	190000000000000000000000000000000000000	SOURCE STATE	SCORE AS	CONTROL (CONTROL CONTROL CONTR

Crop 1: 44 lbs of 0-0-60 = 20 lbs of Chloride" Caution: Seed Placed Fertilizer Can Cause Injury Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 19 K20 = 20AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then

6.3

(65-75)

62.8

(15-20)

31,7

(1-7)

4.8

(0-5)

0.8

(0-5)

Crop 2: 44 lbs of 0-0-60 = 20 lbs of Chloride"\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: \*\* Chloride yield data is limited for this crop.\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 44 K2O = 30AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



SUBMITTED FOR:

WOLF

## SOIL TEST REPORT

FIELD 23
SAMPLE 5
CNTY COR

CNTY CORSON
TWP 22-27

31

QTR N1/2

ACRES 0

PREV. CROP Oats

SEC

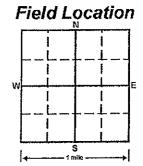
SUBMITTED BY:

SO0453

SD WHT GROWERS-MCLAUGHLIN

BOX 640 MCLAUGHLIN, SD 57642 REF# 8164773 LAB#

25618 BOX# 990



Date Sampled: 7/21/2011 Date Received: 7/25/2011 Date Reported: 7/26/2011

	и	<del></del>										<del> </del>				
NUTRIE	NT IN SOIL	Vi ov	VTERP Low	RETAT	ION:	1000000000	3521165	y-Maltir			X 19 (20)	OP CHOICE			6030162490	P CHOICE
0-6	9 lb/ac						V	ld Goal				d Goal				I Goal
6-24° 0-24°	15 lb/ac 24 lb/ac	wagen					rie	(a Goal			Y le	ia Goal			rien	I Gual
							4	BU			4(	) BU			110	BU
Nitrate						süggi	ESTÉ	D GUID	ELINES	sugg	ESTE	O GUIDELÍN	IES S	UGGE	STED	GUIDELINES
Mudie							Ban	d/Maint			Band	i/Maint. 🧀			Band	/Maint,
// Olsen	24 ppm	*****	1	******		LB/A	CRE	APPL	ICATION	LB/Å	CRE	APPLICA	ION	LB/AC	RE	APPLICATION
Phosphorus						N	38			N	84			Ŋ	108	
Potassium	332 ррт	******	•••••	*****	<b>3</b>	F <sub>2</sub> O <sub>5</sub>	19	Ва	and *	P <sub>2</sub> O <sub>5</sub>	25	Band	*	205	44	Band *
0-24"	20 fb/ac	******				K <sub>2</sub> 0	10	Band (	(Starter)*	K <sub>2</sub> 0	10	Band (Sta	rter)*	ŷ.	10	Band (2x2) *
Chloride						ci	20	Bro	adcast	c	20	Broadea	sst	o l	一	Not Available
0,6° 6-24°	6 lb/ac 24 lb/ac		*****	****		s	10	В	and	S	10	Band		s	10	Band
Sulfur		200				В	0			В	0			В	0	
Boron	0.5 ppm	******	•			Żn	0				0			zn	-	
Zińc	1.27 ppm	*****	*****	*****	*	275825	0			Zn	0			1 (ASSESSE)	0	
Iron	46.5 ppm	*****	****			Fe				Fe				e		
Manganese	8,2 ppm	*****	*****			Mn	0			Mn	0			Y0.	0	
Copper	0.64 ppm	*****	*****	***		Cu	1	Band	(Trial)	Cu	1	Band (Tr	ial)	30	0	
Magnesium	780 ppm		*****	******	****	Mo	0			Mg	0			Va.	0	
Calcium	2328 ppm	*****	*****	*****		Lime	0			Lime	o			me	0	
Sodium	40 ppm									a Kessa	<u>.</u>			VIUS S		
Org Matter	3.4 %					SollpH	Bu	ffer pH	Cation Exchange			% Base S	aturation(T	ypical	Range	
Carbonate	0.1 %	******	***			100			Capacity	% C	a 🏻	% Mg	% K		% Na	%.Н
0-6" 6-24" Sol, Salts	0.38 mmho/cm 0.33 mmho/cm	•••••	•			6,2			19.2 meq	(65-7 60.		(15-20) 33.9	(1-7) 4.4		(0-5) 0.9	(0-5)

Crop 1: 44 lbs of 0-0-60 = 20 lbs of Chloride"\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 19 K2O = 20AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 44 fbs of 0-0-60 = 20 lbs of Chloride"\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

maintain them.

Crop 3: \*\* Chloride yield data is limited for this crop.\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 44 K2O = 30AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



SOIL TEST REPORT

SAMPLE 2

Soil Analysis by Agvise Laboratories Northwood: (701) 587-6010 Benson: (320) 843-4109

SUBMITTED FOR: CORSON COUNTY **FEEDERS** 

MCLAUGHLIN, SD 57642

FIELD 24 CNTY CORSON TWP 22-27 SECTION 31 QTR **ACRES** 

SUBMITTED BY: SD WHT GROWERS-MCLAUGHLIN 109 ELEVATOR ROAD **BOX 640** 

Date Received

Oats

MCLAUGHLIN, SD 57642

PREV. CROP

SO0453

RFF# 8162642 LAB# 2264 BOX# 622

Field Location

Date Sampled:

2/15/2010

2/18/2010

Date Reported:

2/19/2010

					T) /************************************										
IN THE SOIL	INT	ERPF	RETAI	ION	1	STCR	ОР СН	OICE	2	ND CR	OP CHOIC	E	31	RD CRO	OP CHOICE
	VLov	Low	Med	High		Whea	t-Spri	ng		Cor	n-Grain			Sun	flower
						YIEL	D GOA	L		YIELI	D GOAL			YIEL	) GOAL
. N aa iniac		****	**			4	) BU			10	0 BU		<b> </b>	200	0 LBS
					SUG	GESTE	D GUII	DELINES	SUGO	SESTE	O GUIDELI	NES	SUGO	SESTE	GUIDELINES
						******	····			~~~					and
					LB/A	CRE	APPL	ICATION	LB/A		7	TION	LB/A		APPLICATION
1 38 ppm	****	****	****	****	N	25			N	35			N	15	
525 ppm	****	****	****	***	P <sub>2</sub> O <sub>5</sub>	15	Band(	Starter)*	P <sub>2</sub> O <sub>5</sub>	15	Band (2x	2) *	P <sub>2</sub> O <sub>5</sub>	10	Band(Starter)*
36 lb/ac	****	***	**		K <sub>2</sub> O	10	Band(	Starter)*	K <sub>2</sub> O	10	Band (2x	2) *	K <sub>2</sub> O	0	
					CI	4	В	and	Cl	**	kuus.		CI	**	
16 lb/ac 42 lb/ac	****	****	*		s	5	Band	l (Trial)	S	5	Band (Tr	ial)	S	5	Band (Trial)
					В				В				В		
					Zn				Zn				Zn		
				Ĩ	Fe				Fe				Fe		
					Mn				Mo						
0.87 ppm	****	****	***	***	<del>  </del>										
	<u>  </u>								Cu	0	teteri.		Cu	٥	
	┡═┼	<u> </u>			Mg				Mg				Mg		
<u> </u>	┝┈╠				Lime	0.0			Lime	0.0			Lime	0.0	-
		╬	╬	_		T		Cation	]	(	% Base Sa	turatio	n /Typic	al Rano	1e)
0.4 mmho/cm	i ii	- #			Soil ph	i Buf	fer pH	Exchange Capacity	% (		% Mg			% Na	<del></del>
o.o minio/citi					6.0										
	60 lb/ac 85 lb/ac 85 lb/ac 85 lb/ac 85 lb/ac 85 lb/ac 85 lb/ac 86 lb/ac 96	25 lb/ac 60 lb/ac 85	25 lb/ac	25 lb/ac 60 lb/ac 85 lb/ac **** **** **** **** **** **** **** *	VLow Low Med High	Suppose	Solid   Soli	VLow   Low   Med   High   Wheat-Spring   YIELD GOA   A0 BU   SUGGESTED GUIL   Band   LB/ACRE   APPL   A1 BU   Band   A2 BU   Band   Band	VLow   Low   Med   High   Wheat-Spring   YIELD GOAL   40 BU   SUGGESTED GUIDELINES   Band   LB/ACRE   APPLICATION   N   25   D   D   D   D   D   D   D   D   D	VLow   Low   Med   High   Wheat-Spring   YIELD GOAL   GOID/AC   S5 ib/ac   S5 ib/ac	VLow   Low   Med   High   Wheat-Spring   Corr   YIELD GOAL   YIELD G	NTHE SOIL	NTHE SOIL	NTHE SOIL	VLow   Low   Med   High   Wheat-Spring   Corn-Grain   Sun   YIELD GOAL   YIELD G

Crop 1: 8 lbs of 0-0-60 = 4 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Nitrogen Guidelines have been adjusted because most of the Nitrgen in this field is deep. Crop Removat. P205 = 25 K20 = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 8 lbs of 0-0-60 = 4 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P205 = 40 K20 = 27 AGVISE Band guidelines will build P & K test levels to the

Crop 3: 8 lbs of 0-0-60 = 4 lbs of Chloride \* Caution: Seed Placed Fertilizer Can Cause Injury \* Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



## SOUPRESTAREZORU

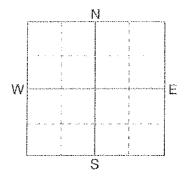
FIELD ID 15, 26 SAMPLE ID 1A 1B COUNTY CORSON

TWP 22-26

SECTION 34 QTR

ACRES 308

PREV. CROP Sunflower



REF #

11234893 BOX #

0

LAB # **NW3077** 

SUBMITTED FOR:

**WULF CATTLE COMPANY** 

ZONES ONLY-BRENT

MZB-SDWG-MCLAUGHLIN

BOX 640

MCLAUGHLIN, SD

57647

SUBMITTED BY: MZ1154

Date Sampled 01/19/2012

Date Received 01/23/2012

Date Reported 1/24/2012

Nutrient I	n The Soil	Interpretation	1	st C	rop Choice	2	nd C	rop Choice	3	3rd Crop Choice						
0-6	16 lb/ac		. Oa	Comments of	\$ (\$\dag{\pi}\$)	Ba	rley-M	alting 🗐 🗘	Co	rn-Gr	ain 🗘					
6-24'	21		79,315,201. 75,35,38,3	YIE	LD GOAL		YIE	LD GOAL		YIE	LD GOAL					
0-24"	28 lb/ac		[100	toping Plat and Orbit	BU	50		BU	100		BU					
Nitrate			sug	GEST	ED GUIDELINES	suc	GEST	ED GUIDELINES	SUG	ED GUIDELINES						
			В	and/M	aint.	В	and/M	aint: 🗘	8	and/M	aint, 🕏					
Olsen Phosphorus	7 ррт		LB/A	CRE	APPLICATION	LB/A	CRE	APPLICATION	LB/A	CRE	APPLICATION					
Potassium	395 ppm		N	72		N	50		N	92						
0-24''	16 lb/ac		P <sub>2</sub> O <sub>5</sub>	27	Band *	P <sub>2</sub> O <sub>5</sub>	24	Band *	P2O5	40	Band *					
Chloride	2010/110		K <sub>2</sub> O	10	Band (Starter)*	K <sub>2</sub> O	10	Band (Starter)*	K <sub>2</sub> O	10	Band (2x2) *					
0-6" 6-24"	8 lb/ac 90 lb/ac		CI	24	Broadcast	GI	24	Broadcast	CI.		Not Available					
Sulfur			5	0		s	0		S	0						
Boron Zinc			В			В		<u> </u>	В							
Iron			21			Zn			Żn.							
Manganese			Fe			Fe			Fe							
Соррег	0.65 ppm		Mn	··································		Mn			Mn							
Magnesium			Cu	1	Band (Trial)	Cu	1	Band (Trial)	Cu	0						
Calcium			Mg			Mg			Mg.							
Sødjum See Matter			time	0		Lime	0		Lime	0						
Org:Matter Carbonate(CCE)			Soll ni	i Buf	fer pH Cation E	vchann	e Can	% Base	Saturat	lon (	Typical Range)					
0-6"	0.25 mmho/cm		,		- yn cadon c	-county	- cap	% Ca	% Mg	% K	% Na % H					
6-24" Sol. Salts	0.6 mmho/cm		6.1	Ì												

Crop 1: 52 lbs of 0-0-60 = 24 lbs of Chloride" \* Caution: 5eed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 19 A GVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 52 ibs of 0-0-60 = 24 lbs of Chloride" \* Caution: 5eed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 24 K2O = 25 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: \*\* Chloride yield data is limited for this crop. \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 40 K20 = 27 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



SUBMITTED FOR:

WOLF

SOIL TEST REPORT

FIELD 27

SAMPLE CNTY

TWP

SEC

CORSON

22-27

34

QTR NW

ACRES 0

PREV. CROP Oats

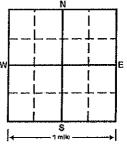
SUBMITTED BY:

SO0453

SD WHT GROWERS-MCLAUGHLIN

**BOX 640** MCLAUGHLIN, SD 57642

Field Location



Date Sampled:

7/21/2011

0.25 mmho/cm 0.24 mmho/cm

0.6

Date Received:

7/25/2011

Date Reported:

REF# 8164769 LAB#

7/26/2011

% H

(0-5)

25620 BOX# 959

0-6 13 ib/ac 6-24". 12 ib/ac 12 ib/ac 25 ib/ac 14 15 ib/ac 15 ib/a	
12 lb/ac   140 BU   40 BU   110   11	BU GUIDELINES
40 BU 40 BU 110  SUGGESTED QUIDELINES SUGGESTED SUGGEST	GUÍDELINES
Nitrate	
	Maint.
	4420 EN 355 TO SEC.
O(S90) 8 ppm	APPLICATION
Phosphorus N 37 N 83 N 107	
P <sub>2</sub> O <sub>5</sub> 19 Band* P <sub>2</sub> O <sub>5</sub> 25 Band* P <sub>2</sub> O <sub>5</sub> 44	Band *
0;24* 32 lb/ac #*****   #	Band (2x2) *
G. 8   Ci. 8	Not Available
Solfur 12 lb/ac 12 lb/ac 12 lb/ac 15 lb	Band (Trial)
Boyon   0.4 ppm   +++++	Broadcast
2.jnc   0.74 ppm   1.1112   1.1122	
33.0 ppm	
Conne	
Magnesium 504 ppm 32000 2000 2000 2000 2000 2000 2000 20	
Mg 0	
Sodium 19 ppm 19	
Cathonale   Cath	

Crop 1: 17 Ibs of 0-0-60 = 8 Ibs of Chloride" Caution: Seed Placed Fertilizer Can Cause Injury Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 19 K20 = 20AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

6.1

Capacity

14.0 mea

(65-75)

64.3

(15-20)

30.1

(1-7)

5.0

(0-5)

0.6

Crop 2: 17 lbs of 0-0-60 = 8 lbs of Chloride"\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then

Crop 3: \*\* Chloride yield data is limited for this crop.\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 44 K20 = 30AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



SUBMITTED FOR:

**CORSON COUNTY FEEDERS** 

MCLAUGHLIN, SD 57642

## SOIL TEST REPORT

FIELD TAYLOR HILL , 28

SAMPLE 4

CNTY CORSON

TWP SEC

22-27 34 QTR 254.65

ACRES 0

PREV, CROP Oats

SUBMITTED BY:

SO0453

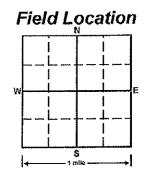
SD WHT GROWERS-MCLAUGHLIN

**BOX 640** MCLAUGHLIN, SD

57642

REF# 8163140 LAB#

42525 BOX# 2576



Date Sampled: 9/9/2011 Date Received: 9/8/2011 Date Reported:

NUTRIENT IN SOIL  INTERPRETATION: Ist CROP CHOICE 2. 2nd 0R0P CHOICE 2		CROP CHOICE
Months Sunflower Corn-Grain		
	<b> </b>	Wheat-Spring
0.6° 30 lb/ac 9 1 lb/ac 9		Yield Goal
0-24 51 lb/ac		40 BU
SUGGESTED GUIDELINES Nitrate	SUGGE	STED GÜIDELINE
Band/Maint. Band/Maint.		Band/Maint
Oisen 32 ppm (1997) September 1997 (1997) Constant of the cons	LB/AC	RE APPLICATION
Phosphorus N 49 N 69	N S	57
Potassium   572 ppm   ******   ************************	P <sub>2</sub> O <sub>5</sub>	25 Band *
K <sub>2</sub> O 0	K,0	10 Band (Starte
0.6" 26 lb/ac (******** ***************************	CI	
6;24' 36 lb/ac ****** ****** * 5 Band (Trial) \$ 5 Band (Trial)	S	5 Band (Tria
Borcon B	В	
Zing 1.41 ppm Harris America Services Zn 0 Zn 2 Band (Trial)	Zn	0
fron Fe Fe Fe	Fe	
Mengarese Min Min Min	Mn	
Copper Cu Cu Cu Magnesiùn	Cu	
Calcum	Mg	
Souluin Cima Co Lime C	Lime	0 ]
Org Matter 3.1% Firms Firms Cation % Base Saturation	ion(Typical)	Range)
Carbonate Soll PH Buffer PH Exchange Capacity % Ca % Mg 9	% K	%Na %H
0.65 0.36 mmho/cm		

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



## SOIL TEST REPORT

Field 29 FIELD ID 4-20-25 SAMPLE ID 44 COUNTY CORSON TWP 21-25 K SECTION 32 QTR

PREV. CROP Sunflower

ACRES 0

SUBMITTED FOR:

**CORSON COUNTY FEEDERS** 

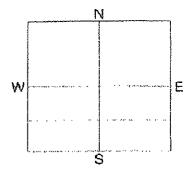
SUBMITTED BY: S00453

SD WHT GROWERS-MCLAUGHLIN

**109 ELEVATOR ROAD** 

**BOX 640** 

MCLAUGHLIN, SD 57642



REF # 11234743 BOX #

LAB # NW181635

Date Sampled

Date Received 12/14/2011

Date Reported 12/29/2011

Nutrient In The Soil	Interpretation	1st Cr	op Choice	2nd C	rop Choice		rop Choice
	yygy Low Med Han	Vinear Sa	rng s 🎏	Wheats		[Winat	acina (1.1.1.2.1
0.4 8 1b/n 12 1b/n		Deligeration of the second of the	D GOAL	Ya.	ELD GOAL		ELD GOAL
<b>10.84</b> 20 lb/a		30	Bushels	40	Bushels	50	Bushels
Morete		SUGGESTE	O GUIDELINES	SUGGES	red Guidelines	sugges	TED GUIDELINES
	<u> </u>	Langua .	Angele and Till	Beng		Land	•
Siller 12 ppm Profesional		LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LBYAGRE	· · · · · · · · · · · · · · · · · · ·
Pagess (IT) 280 ppm	identification	N 61		88		115	
. (1984) 12 lb/ac		75E 15	Band (Starter)*	260 18	Bend *	23	Band *
April 4 lb/ac	30 (8) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	f 0 10	Band (Starter)*	F30 10	Band (Starter)*	10 10	82nd (Starter)*
Fat 6 lb/ac		28	Broadcast	L! 28	Broadcast	C) 26	Broadcast
		\$ 10	Band	5 10	Band	10	Bend
Application of the state of the							****
Dippet 0.36 ppm							
lee resider 1972		2 2	Band	C4_ 2	Band	Cu 2	Band
elektri					<u> </u>	900	
eg maser		Time 0		The o			(my <del>per a</del> l kange)
a de la companya de l	(Internal Control	Sankgralburt	en ortiCationE	kahanya Ca	TOWN THE PARTY OF	1000	C 70 HS I F J
0.13 mmho/cm 6.24 0.25 mmho/cm		6.0					

Crop 1: 61 lbs of 0-0-60 = 28 lbs of Chloride" \* Caution: Seed Flaced Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 19 K20 = 11 A GVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 61 lbs of 0-0-60 = 28 lbs of Chloride" \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 15 A GVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 61 |bs of 0-0-60 = 28 |bs of Chibride" \* Caution: Seed Pisced Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 91 K20 = 19 A GVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by: Agvise Laboratories Northwood: (701) 587-6010

Benson: (320) 843-4109

SUBMITTED FOR:

WULF CATTLE CO.

MCLAUGHLIN, SD

Sol. Salts

## **SOIL TEST REPORT**

**FIELD** 3931 32

SAMPLE

SEC

CNTY CARSON

TWP 21-26

QTR

PREV. CROP Wheat-Spring

SUBMITTED BY:

SD WHT GROWERS-MCLAUGHLIN

**BOX 640** MCLAUGHLIN, SD

57642

SO0453

ACRES 0

Field Location

55763 BOX# 3925

REF# 8163510 LAB#

S

Date Sampled	:			Date F	Received:			9/	19/2011	1			Da	te Reported:			11/11/2011			
NUTRIE	NT IN SOIL		NTERP	RETAT	ION		1:	st CR	OP CH	DICE		2n	d CR	OP CHOICE		,	3rd (	CRO	CHOIC	Œ
		VLow	Low	Med	High				Oats				Cor	n-Grain			Sunflower			
0-6" 6-24"	17 lb/ac 15 lb/ac							Yie	ld Goai					Yield						
0-24"	32 lb/ac	*****						10	0 BU				2000			LBS				
Nitrate							sugg	ESTE	D GUID	ELINES		SUGGE	STE	D GUIDELIN	IES	SUG	3ES	TED	GUIDEI	INES
Tria dio								Ban	d/Maint	l				E	3and/	Maint.				
Olsen	7 ppm	*****	*****	<u> </u>		]]]	LB/A	CRE	APPL	ICATION		LB/AC	RE	APPLICAT	ΓΙΟΝ	LB/	٩CF	₹E	APPLIC	ATION
Phosphorus			<u> </u>		_		N	68				N	88			N		68		
Potassium	333 ppm	*****	*****	*****	******		P <sub>2</sub> O <sub>5</sub>	27	В	and *		P <sub>2</sub> O <sub>5</sub>	40	Band '	•	P20		22	Ваг	d *
0-24" Chloride	20 lb/ac	*****	**				к <sub>2</sub> 0	10	Band	(Starter)*		к <sub>2</sub> 0	10	Band (2x	2) *	к <sub>2</sub> 0		0		
0-6"	26 lb/ac	*****	*****	****	] <u> </u> 		CI	20	Bro	adcast		CI		Not Availa	able	CI			Not Av	allable
6-24" Sulfur	360 +lb/ac	*****	*****	*****	*****		s	0				s	0			S		0		
Boron				]			В					В				В				
Zinc							Zn		<u> </u>			Zn				Zn				
Iron							Fe					Fe				Fe				
Manganese							Mn				Ī	Mn				Mn	1			
Copper	0.58 ppm	*****	*****	*			Cu	1	Band	(Trial)	1	Cu	0			Cu		1	Band (	Trial)
Magnesium						lli	Mg		<del></del>		ľ	Mg	-	/ <u></u>		Mg	iF			
Calcium							Lime	0	[		ŀ	Lime	0		=	Lime		0	×	
Sodium									<u></u>		L					Larie		<u></u>		
Org. Matter										Cation				% Base Sa	aturatio	on(Typic	al R	ange)		
Carbonate							Soil pH	81	iffer pH	Exchange Capacity	e	% C	a ]	% Mg	9/	6 K	9	% Na	7	 % Н
0-6" 6-24"	0.38 mmho/cm 1.09 mmho/cm	*****	***	*****				뉴		<u></u>	=		_	9	F				_	

Crop 1: 44 lbs of 0-0-60 = 20 lbs of Chloride\*\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 19AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then

maintain them.
Crop 2: \*\* Chloride yield data is limited for this crop.\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and

Crop 3: \*\* Chloride yield data is limited for this crop.\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



SUBMITTED FOR:

**BACHMIER FARMS** 

## SOIL TEST REPORT

1 33,34

CORSON

QTR

SAMPLE

CNTY

TWP

SEC

21-26

PREV. CROP Wheat-Spring

ACRES 0

SUBMITTED BY: SO0453

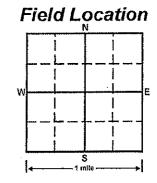
SD WHT GROWERS-MCLAUGHLIN

**BOX 640** 

MCLAUGHLIN, SD

57642

REF# 8164469 LAB#



2247 BOX# 0

Date Sampled: Date Received: 2/13/2009 Date Reported: 11/11/2011

Date Campies			Date Received.				2/13/2009					e Reported.	17/17/2011			
NUTRIE	NT IN SOIL		NTERPI	RETATI	ON	1	st CRC	ор сно	CE	2	nd CR	OP CHOICE		3	ord CRC	P CHOICE
		VLow	Low	Med	High		Whea	ıt-Sprin	g		Sur	flower				
0-6" 6-24"	22 lb/ac 63 lb/ac						Yield Goał				Yie	ld Goal		Yie	d Goal	
0-24"	85 lb/ac	*****	*****	*****			40	BU			2000	LBS				
Nitrate						SUGG	ESTE	) GUIDI	ELINES	sugg	ESTE	) GUIDELIN	1ES	SUGO	GUIDELINES	
							Band					land				1
Olsen	10 ppm	*****	*****	***	/ <u> </u>	LB/A	CRE	APPLI	CATION	L.B/A	CRE	APPLICA1	rion	LB/A	ACRE	APPLICATION
Phosphorus						N	28			N	15			N	<u> </u>	
Potassium	339 ppm	*****	*****	1****	******	P <sub>2</sub> O <sub>5</sub>	21	Ba	ınd *	P <sub>2</sub> O <sub>5</sub>	20	Band '	*	P <sub>2</sub> O <sub>5</sub>		
0-24"	28 lb/ac	****	****			К <sub>2</sub> О	10	Band (	Starter)*	κ <sub>2</sub> 0	0			к <sub>2</sub> 0		
Chloride 0-6"	20 % /	*****	*****	**		CI	12	Broa	adcast	CI		Not Avaita	able	CI		
6-24" Sulfur	20 fb/ac 24 lb/ac	*****	*****	****		s	5	Band	(Trial)	s	5	Band (Tr	ial)	s		
Boron		<u></u>				В				В				В	<u></u>	
Zinc						2n				Zn				Zn		
Iron						Fe				Fe				Fe	]	
Manganese						Mn				Mn				Mn		
Copper	0.55 ppm	*****	*****	*		Cu	1	Band	(Triai)	Cu	1	Band (Tri	ial)	Cu		
Magnesium						Mg				Mg				Mg		
Calcium						Lime	0			Lime	0			Lime		
Sodium						[]		L				<u> </u>		L.	<u> </u>	
Org. Matter						Soil ph	ı    Bu	ffer pH	Cation			% Base Sa	aturatio	on(Typic	ai Range	»)
Carbonate						""			Exchange Capacity	%	Са	% Mg	%	к	% Na	% н
0-6" 6-24" Sol. Salts	0.28 mmho/cm 0.29 mmho/cm	*****	*			6.0										

Crop 1: 26 lbs of 0-0-60 = 12 lbs of Chloride"\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: \*\* Chloride yield data is limited for this crop. \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 18 K2O = 22AGVISE Band guidelines will build P & K test levels to the medium range over many years.



SUBMITTED FOR:

**BACHMIER FARMS** 

## SOIL TEST REPORT

FIELD 35

SAMPLE

SEC

CORSON

TWP 21-25

10 QTR

ACRES 0

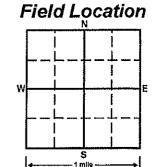
PREV. CROP Wheat-Spring

SUBMITTED BY:

SO0453

SD WHT GROWERS-MCLAUGHLIN

BOX 640 MCLAUGHLIN, SD 57642



REF# 8164472 LAB#

2250 BOX# 0

Date Sampled: Date Received: 2/13/2009 Date Reported: 11/11/2011

NUTRI	ENT IN SOIL		INTERF	RETAT	ION		1st	CRC	P CHC	DICE		2nd CF	OP CHOICE	Ē		3rd CR	OP CI	HOICE	
		VLov	v Low	Med	High		٧	Vhea	ıt-Sprin	ng .		Su	nflower						
0-6" 6-24" 0-24"	15 lb/ac 48 lb/ac							Yiel	d Goaf			Yii	eld Goal			Yle	id Go	al	
0-24	63 lb/ac		*****					40	BU			200	0 LBS						
Nitrate						suc	SUGGESTED GUIDELINES				sug	GESTE	D GUIDELII	NES	SUGGESTED GUIDEL			IDELINES	
							Band  LB/ACRE APPLICATION						Band				٦٢		
Olser Phosphorus	8 ppm	*****	1						APPL	CATION	<u></u>	ACRE	APPLICA	TION		ACRE	APF	PLICATION	
Potassium	424 ppm	*****	1*****	*****	*****	N	<u></u> ן∟	45 23		and *	N	37	Band		N	<u> </u>			
0-24"						P <sub>2</sub> O	국는		<u></u>	(Starter)*	P <sub>2</sub> O	<u></u>	] Banu		P <sub>2</sub> O	<b>⊣;===</b>			
Chloride	24 lb/ac	*****				K <sub>2</sub> C	┵┝┈	16		adcast	K <sub>2</sub> O		Not Avail	able	K <sub>2</sub> O CI	╬	╢_		
0-6" 6-24" Sulfer	,	*****	*****	*****	*****	s	jĖ	7		l (Trial)	s	7	Band (Ti		s				
Boron			<u> </u>			В					8				В				
Zinc						Zn					Zn	<u> </u>			Zn		<u> </u>		
ron						Fe		_			Fe		<u> </u>		Fe	<u> </u>	Ļ		
Manganese		*****				Mn	<u>JL</u>				Mn	<u> </u>	<u> </u>		Mn	<u> </u>			
opper lagnesium	0.63 ppm		*****	**		Cu		1	Band	(Trial)	Cu	1	Band (Tr	iai)	Cu	<u> </u>	<u> </u>		
alcium						Mg	ļĻ	_			Mg	<u>                                     </u>	<u> </u>		Mg	<u> </u>			
odium						Lime					Lime	<u> </u>	<u> </u>		Lime		<u>                                     </u>		
rg. Matter										Cation			% Base S	aturatio	on(Typic	al Rang	e)		
erbonate						Soil	ÞΗ	Buf	fer pH	Exchange Capacity	 	Ca	% Mg	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	ь к	% N	a	% H	
0-6" 6-24" I. Salts	0.38 mmho/cm 0.55 mmho/cm	*****	***	•		7.0													

Crop 1: 35 lbs of 0-0-60 = 16 lbs of Chloride<sup>114</sup> Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 15AGVISE Band guidelines will build P & K test levels to the medium range over many years. Crop 2: \*\* Chloride yield data is limited for this crop.\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P205 = 18 K20 = 22AGVISE Band guidelines will build P & K test levels to the medium range over many years.



SUBMITTED FOR:

## Soughesticepoin

FIELD IC 36
SAMPLE ID 4A 4B
COUNTY CORSON
TWP 21N-25E

SECTION 10 QTR

PREV. CROP Sunflower

SUBMITTED BY: MZ1154

MZB-SDWG-MCLAUGHLIN ZONES ONLY-BRENT

BOX 640

MCLAUGHLIN, SD

57647

ACRES 159

W S

0

REF # 11234896 BOX #

LAB # **NW3080** 

Date Sampled 01/19/2012

**WULF CATTLE COMPANY** 

Date Received 01/23/2012

Date Reported 1/24/2012

	Viitrient I	In The Soil Interpretation		31	si (e	rop Choice	2	ma <b>C</b>	rop Choice	Grd Crop Choice						
	0-6' 6-24'	8 lb/ac 6 lb/ac		) (Oa		<b>₽</b> } ELD GOAL	B a	(	laiting ♣	(Co	rn-Gra YJEL	in Ç				
	0-24	14 lb/ac		100	in jing	Ви	50		BU	100		BU				
Nitrate					****	ED GUIDELINES	-	and/M	eD GUIDELINES	1	GESTE and/Ma	D GUIDELINES				
Phosphori	Olsen us	23 ppm		LB/A	1	APPLICATION	10000000000	ACRE	APPLICATION	30.2250.00	ACRE	APPLICATION				
Potassium	1	576 ppm		N P <sub>2</sub> O <sub>5</sub>	86 25	Band *	N P2O5	64 24	Band *	P <sub>2</sub> O <sub>5</sub>	106 40	Band *				
Chloride	0-24"	8 lb/ac		620	10	Band (Starter)*	κ₂0	10	Band (Starter)*	K <sub>2</sub> O	10	Band (2x2) *				
Sulfur	0-6" - 6-24"	10 lb/ac 24 lb/ac		G	32	Broadcast	CJ.	32	Broadcast	CI .		Not Available				
Boron				S	7	Band (Trial)	S B	7	Band (Trial)	S B	7	Band (Trial)				
Zinc Iron	1902			Zn			Zn			Zn						
Manganese Copper	e i	0.5 ppm		Fe Mn			Fe Mn			Fe		e de de la compansa d				
Magnesium	ı			Cu	1	Band (Trial)	Cu	2	Band	Cu	0					
Calcium Sodium				_Mg Lime	0		Mg Ume	0		Mg Lime	0					
Org.Matter Carbonate(				Soll ni	l Buf	fer pH Cation E	vchape	e Can	% Base \$		on (T	ypical Range)				
ool. Salts	0-6" 6-24"	0.2 mmho/cm 0.32 mmho/cm		6.2		, s. p. Gadon E	-cnang	e cap	% Ca 19	% Mg	% K	% Na				

Crop 1: 70 lbs of 0-0-60 = 32 lbs of Chloride" \* Caution: Seed Placed Pertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests, Crop Removal: P205 = 25 K20 = 19 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 70 lbs of 0-0-60 = 32 lbs of Chloride" \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 24 K20 = 25 AGVISE Band/Maintenance guidelines will bulld P & K test levels to the medium range over many years and then maintain them.

Crop 3: \*\* Chloride yield data is limited for this crop. \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 40 K20 = 27 A GVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

## LABORATORIE

Soil Analysis by: Agvise Laboratories Northwood: (701) 587-6010 Benson: (320) 843-4109

SUBMITTED FOR:

**BACHMIER FARMS** 

## **SOIL TEST REPORT**

SAMPLE

FIELD

CNTY

CORSON

TWP 21-25

11 QTR

SEC PREV. CROP Wheat-Spring

ACRES 0

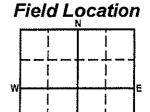
SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN

BOX 640 MCLAUGHLIN, SD 57642

REF# 8164471 LAB#

2249 BOX# 0



Date Sampled	i:			Date R	leceived:		2/13/2009						Dat	e Reported:		11/11/2011				
NUTRIE	NT IN SOIL		INTERP	RETATI	ION		1	st CRO	OP CH	OICE		2n	d CRO	OP CHOICE			3rd	CRO	P CH <b>O</b> l	CE
		VLo	w Low	Med	High		Wheat-Spring					·	Sur	iflower						
0-6" 6-24"	17 lb/ac 39 lb/ac							Yle	ld Goa	1			Yiel	d Goal	]			Yield	l Goal	
0-24"	56 lb/ac	*****	****					40	BU				2000	LBS						
Nitrate							SUGG	ESTE	GUIE	DELINES		SUGGE	STE	) GUIDELIN	ŧES	suc	GE	STED	GUIDE	LINES
   								B	and				В	and						
Olsen Phosphorus	13 ppm	*****	*****	*****			LB/A		APPL	ICATION		LB/AC		APPLICAT	rion	LE	/AC	RE	APPLI	CATION
Potassium	516 ppm	*****	*****	*****	*****		N	52 17		land *		N	44 18	Band '		N	۲,	_		
0-24"	28 lb/ac	*****				=	20 <sub>5</sub>	10		(Starter)*		P <sub>2</sub> O <sub>5</sub>	0	Daild	<u>}</u>	P <sub>2</sub> C	=,;			
Chloride		<u> </u>	_[			╠	cı	12	Bro	adcast	7	Ci		Not Availa	able	CI	ᆕ			
0-6" 6-24" Sulfur	16 lb/ac 30 lb/ac	*****	*****	*****			s	5	Ben	d (Trial)		s	5	Band (Tr	iai)	s				
Boron		<u> </u>					В					В				В				
Zinc							Zn	]				Zn				Zn				
Iron							Fe				Ĺ	Fe				Fe				
Manganese		<u></u>					<b>M</b> n					Mn				Mn				]
Copper	0.65 ppm	*****	*****	***		Ľ	Cu	1	Banc	t (Triai)	Ĺ	Си	1	Band (Tri	al)	Cu				
Calcium		L		[] [		Ľ	Vig				L	Mg				Mg				
Godium						Li	me	0			l	Lime	0			Lim	)			
Org. Matter						Γ		7		Cotion				% Base Sa	aturatio	on(Typ	ical I	Range)	,	
Carbonate						5	Soil pH	8ut	fer pH	Cation Exchange Capacity		% C	<u> </u>	% Mg		K K	<u> </u>	% Na	11	% н
0-6* 6-24* ol. Salts	0.38 mmho/cm 0.38 mmho/cm	*****	***			F	6.7					7, 0,		77 Mig		- 13				,,,

Crop 1: 26 lbs of 0-0-60 = 12 lbs of Chloride\*\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: \*\* Chloride yield data is limited for this crop. \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 18 K2O = 22AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by: Agvise Laboratories Northwood: (701) 587-6010 Benson: (320) 843-4109

SUBMITTED FOR:

**BACHMIER FARMS** 

### SOIL TEST REPORT

FIELD 38 SAMPLE 4

TWP

CNTY CARSON

21-25

SEC 12 QTR PREV. CROP Wheat-Spring ACRES 0

g

SUBMITTED BY:

SO0453

SD WHT GROWERS-MCLAUGHLIN BOX 640

MCLAUGHLIN, SD 57642

REF# 8162968 LAB# 127096 BOX# 3973

Field Location

Date Sampled: 10/21/2010 Date Received: 10/25/2010 Date Reported: 11/11/2011

						L							·		<u> </u>			
NUTRIE	NT IN SOIL		NTERPI	RETATI	ON		1:	st CR	OP CHO	DICE		2nd CR	OP CHOICE		3	rd CRC	P CHOIC	CE
		VLow	Low	Med	High			Whea	at-Sprir	ng		Barle	y-Malting			Sur	flower	
0-6" 6-24"	6 lb/ac 6 lb/ac							Yie	ld Goal			Yie	ild Goal			Yie	d Goal	
0-24"	12 lb/ac	**						40	) BU			8	0 BU			2000	LBS	
Nitrate							suggi	ESTE	D GUID	ELINES	sug	GESTE	D GUIDELIN	1ES	sugo	ESTE	GUIDE	Lines
									d/Maint			Ban	d/Maint.				i/Maint.	
Olsen	8 ppm	*****	*****		<u> </u>		LB/A		APPL	ICATION	LB	ACRE	APPLICAT	TION	LB/A	CRE	APPLIC	ATION
Phosphorus		<u> </u>	<u> </u>			$\parallel \parallel$	N	96	<u> </u>		N	112			N	88	<u> </u>	
Potassium	334 ррм	*****	*****	*****	*****		P <sub>2</sub> O <sub>5</sub>	25	В	and *	P <sub>2</sub> 0	38	Band	*	P <sub>2</sub> O <sub>5</sub>	22	Bar	1 <b>d</b> *
0-24" Chloride	20 lb/ac	*****	**				κ <sub>2</sub> 0	10	Band	(Starter)*	K <sub>2</sub> 0	10	Band (Sta	rter)*	K <sub>2</sub> O	0		
0-6"	4 lb/ac	****					CI	20	Bro	adcast	CI	20	Broadca	ast	CI	]	Not Av	allable
6-24"	36 lb/ac	****	*****	****	**		s	10	В	and	s	10	Band		s	10	Ва	nd
Boron		ļ —					В				В				В	<u> </u>		
Zinc							Zn				Zπ	<u> </u>	]		Zn			
Iron							Fe				Fe				Fe		][	
Manganese							Mn				Mn				Mn			
Copper	0.43 ppm	*****	****				Cu	2	8	and	Cu	2	Band		Cu	1	Band	(Triai)
Magnesium							Mg		<u></u>		Mg				Mg			
Calcium							.ime		<del> </del>		Lime	0	]		Lime	0		===
Sodium													<u> </u>			<u> </u>		
Org. Matter							Soil pH		-ffor =11	Cation			% Base S	aturati	оп(Туріс	al Rang	e)	
Carbonate							oui pH		affer pH	Exchange Capacity	·	Ca	% Mg	9	6 K	% N:	a	% н
0-6" 6-24" Sol. Salts	0.18 mmho/cm 0.33 mmho/cm	461R 441444	**				6.4											

Crop 1: 44 lbs of 0-0-60 = 20 lbs of Chloride<sup>118</sup> Caution: Seed Placed Fertilizer Can Cause injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 44 lbs of 0-0-60 = 20 lbs of Chloride"\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 38 K2O = 40AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

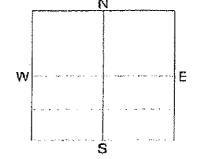
Crop 3: \*\* Chloride yield data is limited for this crop.\* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.



Soil Analysis by <u>Agylse Laboratories</u> Northwood: (701) 587-6010 Benson: (320) 843-4109

### **SOIL TEST REPORT**

FIELD ID 39 73-21-25
SAMPLE ID 36 73-21-25
COUNTY CORSON
TWP 21-25
SECTION 14 QTR ACRES 0
PREV. CROP Com-Grain



SUBMITTED FOR: CORSON COUNTY FEEDERS SUBMITTED BY: S00453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD 57642

REF # 11234727 BOX # 0 LAB # NW180930

Date Sampled

Date Received 12/12/2011

Date Reported 12/29/2011

Nutrient In The Soil	Interpretation		op Choice	2nd	Crop Choice	3rd	Crop Choice
	toll- beld worlwed			[Wiest	Spring		yyer († ‡)
7 ib/a: 5-24 9 lb/a:		**************************************	D GOAL	2 50 10 1	JELD GOAL	بر بستستال	VIELD GOAL
16 lb/ac		2000	Pounds	40	Bushels	1800	Pounds
in the second se		SUGGESTE	o cotoerines	SUGGE	TED GUIDELINES	SUGGE	STED GUIDELINES
		Bend		(E)		(Bare	
д жи <b>Ове</b> п 13 ррп		LB/ACRE	tive the constitution of t	LB/ACR		LB/ACR	
376 ppm	Control of the contro	61 84		92	" 1,1 p. 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	7	
9 (84) 20 lb/ac		Pr.Os. 18	Band *	Page 17	Band *	1	6 Band +
Distance in the second		84.70° 0		10	Band (Starter)*	4 00 C	
6 6 14 lb/ac 36 lb/ac	I TOTAL STEEL STEE		Not Available	60 20	<del></del>		Not Available
	27 (14) 77 (14)	7	Band (Trial)	7	Band (Trial)	5 7	Band (Trial)
	Marie	9				E.	
		26		21		26	
parties of the second s							
рде 0.58 ppm graes lurg		2 1	Band (Trial)	21 1	Band (Trial)	60, 1	Band (Trial)
		e e				119	
No.	OTE WEE	ing a		4 10 0		Laran o	
					Vo Dasa	Serie and the	Yapicai tongo
# 6 0.22 mmho/cm		SOU PELEVO	era jaj Cadron S	conange C		acent Pe	F 36 MH 36
		6.7		··			

Crop 1: \*\* Chloride yield data is Emited for this crop. \* Caution: Seed Placed Fertilizer Can Cause Injury \* Nany crops may respond to a starter application of P & K even on high soli tests. Crop Removal: P2OS = 18 K2O = 22 AGVISE Band guideEnes will build P & K test levels to the medium range over many years.

Crop 2: 44 lbs of 0-0-60 = 20 lbs of Chloride" \* Caution: Seed Placed Fortilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: \*\* Chloride yield data is limited for this crop. \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2Q5 = 16 K2O = 20 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

E



Soil Analysis by <u>Agvise Laboratories</u> Northwood: (701) 587-6010 Benson: (320) 843-4109

**SOIL TEST REPORT** 

FIELD ID 40 SAMPLE ID 36 COUNTY CORSON TWP 21-25

SUBMITTED BY: \$00453

SECTION 14 QTR ACRES 0

57642

PREV. CROP Com-Grain

**109 ELEVATOR ROAD** 

MCLAUGHLIN, SD

**BOX 640** 

11234727 BOX #

REF # NW180930 LAB #

SUBMITTED FOR:

CORSON COUNTY FEEDERS

Date Sampled

Date Received 12/12/2011

SD WHT GROWERS-MCLAUGHLIN

Date Reported 12/29/2011

Nutrient In The Soil	Interpretation	1st C	rop Choice	2nd C	rop Choice	3rd C	rop Choice
7 lb/ac	Visov Low Ned High	5.00sm		(Wigati	ellis (* j		
9 lb/ac		, VIE	LD GDAL	Y Y	LD GOAL		ELD GOAL
15 (b/ac		2000	Pounds	40	Bushels	1800	Pounds
		300	ed competines	SUGGEST	ed Guidelines	SOGGES	TED GUIDELINES
		Rect		1000		LEAST.	
Property of the second		LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LE/ACRE	APPLICATION
36 ppm 376 ppm	ensign No. 10	94 84 Pars 18	Band *	92 1334 17	Band *	74	Band *
9/88 20 lb/ac	1022) 1740)	0 O		10	Band		
14 lb/ac 14 lb/ac 36 lb/ac			Not Available	60 20	(Starter)* Broadcast	je i	Not Available
		7	Band (Trial)	7	Band (Trial)	7	Band (Trial)
	New York						
	and the second				ļ		
0,68 ppm							
ancestres - July		1	Band (Trial)	1	Band (Trial)	1	Band (Trial)
			***************************************	79			
e Rum		inne o	A STATE OF THE STA	0		D .	
Suprode Research		on per par	fer parament	earrege Ca			Canthal Carge Season Seas
	y.≮e: 31():	6.7					

Crop 1: \*\* Chloride yield data is Emited for this crop. \* Caution: Seed Placed Fertilizer Can Cause Injury \* Nany crops may respond to a starter application of P & K even on high soli tests. Crop Removal: P205 = 18 K20 = 22 AGVISE Band guidefines will build P & K test levels to the medium range over many years.

Crop 2: 44 ibs of 0-0-50 = 20 ibs of Chieride" \* Caution: Seed Placed Fertilizer Can Cauce Ynjury \* Many crops may respond to a starter application of P & K even on high solitests. Crop Removal: P205 = 25 K20 = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: \*\* Chloride yield data is imited for this crop. \* Caution: Seed Placed Fortilizer Can Cause Injury \* Many crops may respond to a starter application of P & K aven on high soil tests. Crop Removal: P205 = 16 K20 × 20 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by: Agvise Laboratories Northwood: (701) 587-6010 Benson: (320) 843-4109

SUBMITTED FOR:

CORSON COUNTY FEEDERS

MCLAUGHLIN, SD 57642

Date Sampled:

SOIL TEST REPORT

KAPASTINSKI SOU/41 4 42 FIELD

SAMPLE

CNTY CORSON TWP 21-26

SEC 24 QTR 158.52

PREV. CROP Wheat-Spring

SUBMITTED BY:

SD WHT GROWERS-MCLAUGHLIN

**BOX 640** MCLAUGHLIN, SD 57642

Date Received:

SO0453

9/8/2011

ACRES 0

REF# 8163139 LAB#

Field Location

42519 BOX# 2576

9/9/2011 Date Reported:

1900 St. 1800 St. 180		EZ				BERGERSON								OPERATOR OF THE PERSON NAMED IN COLUMN NAMED I
NUTRI	ENT IN SOIL		NTERP	RETAT			ica	P, CHOICE		hd Cr	OP CHOICE		d CRO	P CHOICE
		N Veov	Law	Ueu	High		Con	ı-Grain		Con	1∙Grain		Sun	flower
0-6"   6-24"	15 lb/ad 24 lb/ad						Yiel	d Goal		Yiel	d Goal		Yiel	d Goal
0-24"	39 lb/ad	*****	*			100	100	BU		120	BU		2000	LBS
Nitrate					152	SUGG	ESTEC	GUIDELINES	SUGG	SESTEI	) GUIDELINES	sugg	ESTEC	) GUIDELINES
							Band	l/Maint.		Band	I/Maint,		Band	I/Maint.
Olsen	17 ppm	111111111111111111111111111111111111111	******	1	*****	LB/A	CRE	APPLICATION	LB//	ÄČRE	APPLICATION	LB/A	CRE	APPLICATION
Phosphorus						N	81		N	105		N	61	
Potassium	257 ррт	******		1-111		P <sub>2</sub> O <sub>5</sub>	40	Band *	P <sub>2</sub> O <sub>5</sub>	48	Band *	P <sub>2</sub> O <sub>5</sub>	18	Band *
Chloride						к <sub>2</sub> о	10	Band (2x2) *	K <sub>2</sub> 0	10	Band (2x2) *	K <sub>2</sub> O	0	
0.6"	10 lb/ac	*****				CI			Cl			ci		
6-24° Sülfur		*14***		1		S	9	Band (Trial)	S	9	Band (Trial)	\$	9	8and (Trial)
Boron						В			В			8		
Zinc	0.47 ppm	*****				Żn	2	Band	Zn	2	Band	Zn	2	Band (Trail)
Iron						Fe			Fe			Fe		
Manganese						Mn			Mn			Mn		
Copper						Cu			Cü			Cu		
Magneslum			1			Mg			Mg			Mg		
Calcium						Lime			Lime			Lime		
Sodium						ESCENDIL	الــــا	Overpred legisteration		Wavester.	V	][[[]		
Org Matter Carbonate	2.7 %					Soil pH	Bui	Cation fer pH Exchang			% Base Satura	ation(Typical	Range	) · · · · ·
0-6"	0.18 mmho/cm	4446						Capacity	10010000	Ca	% Mg	% K	% Ña	%н
6-24" Sol. Salts	0.18 mmho/cm	<b>.</b>				5.6								
rop 1: * Caution:	Seed Placed Fertilia	rer Can Ca	ause Iniur	v *Manv c	rone may	reepond	10.00	artar application		<u> </u>	an high soil f	orio Cron	Domo	wal: 0205 = 3

Crop 1: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soit tests. Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 48 K2O = 32AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: \* Caution: Seed Placed Fertilizer Can Cause Injury \*Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

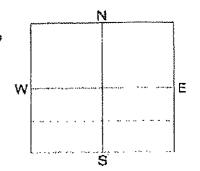
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Soil Analysis by Agvise Laboratories Northwood: (701) 587-6010 Benson: (320) 843-4109

### SOIL TEST REPORT

FIELD ID 5 43
SAMPLE ID 43
COUNTY CORSON 7
TWP 21-25
SECTION 26 QTR ACRES 0



11234742 BOX #

SUBMITTED FOR:

CORSON COUNTY FEEDERS

SUBMITTED BY: \$00453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD

57642

BOX 640

MCLAUGHLIN, SD

PREV. CROP Sunflower

NW181634

REF #

LAB #

Date Sampled

Date Received 12/14/2011

Date Reported 12/29/2011

Nutrient In T	he Soif	Interpretation	15	t Cro	op Choice	·		ap Choice			op Choice
	4	yow Low Med Friah	N.	91.50	100		-35 -306-42-1				ing in the
4 6 6	9 lb/ac 9 lb/ac			YYEL	D GOAL		YIE	O GUAL		YJEL	D GOAL
234	18 lb/ac		30		Bushels	40		Bushels	50		Bushels
e e			127 28 4 1 1		D GUIDELINES	suc	(GEST	O GUIDELINES		715.	D GUIDELINES
		NEWSTIN AND ADDRESS OF THE PARTY OF THE PART					918.		سيستينا ا		
e de la companya de l	12 ppm		LB/AC	RE	APPLICATION	1.87	CRE	APPLICATION	The second second	CRE.	APPLICATION
esement in	275 ppm	(4) (4) (4) (4) (4) (4) (4) (4) (4) (4)		63	Band		80			117	
4.4	16 lb/ac			15	(\$tarter)*		18	Band *		23	Band *
toniae Cara	8 lb/ac			10	Band (Startor)*	1.5	10	Band (Starter)*	1.0	10	Band (Starter)*
<b>6.3</b> 1	8 lb/ac 12 lb/ac			24	Broadcast	Ĉ.	24	Broadcast		24	Broadcast
			1.5	7	Band (Trial)		7	Band (Trial)		7	Band (Trial
				$\dashv$		4					
		en e		一十					7e.		
	0.56 ppm	1000 1200					72		No		
currence			200.00	1	Bund (Triel)	C.	1	Band (Trial)	366	1	Band (Trial)
				D		1	0		100	0	
4			1934353					. W. Hase			Appeal Range
pale trace (SE)		and S	Som per	-	er ala Cation B	ector		8.14	e no	%) K	a in se
	,23 mmho/cm ,38 mmho/cm		5.3	T TOTAL	Access of the Association of the	NAME OF TAXABLE PARTY.	* ARGONIA	Moreowall and and on sold in			

Crop 1: 52 lbe of 0-0-60 = 24 lbs of Chloride" \* Czution: Seed Placed Pertilizer Can Cause Injury \* Many crops may respond to a starter application of P & Keven on high soil tests. Crop Removal: P205 = 19 K20 = 11 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 52 lbs of 0-0-60 = 24 lbs of Chloride" \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & Keven on high soil tests. Crop Removal: P205 = 15 K20 = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 52 lbs of 0-0-60 = 24 lbs of Chloride" \* Caution: Seed Placed Pertilizor Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 31 K20 = 19 Agvise Band guidalines will build P & K test levels to the medium range over many years.

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Soil Analysis by Agvise Laboratories Northwood: (701) 587-6010 Benson: (320) 843-4109

### **SOIL TEST REPORT**

44 FIELD ID Y. SAMPLE ID 44 COUNTY CORSON TWP 21-25 K SECTION 32 **QTR** 

PREV. CROP Sunflower

W ACRES 0

> REF # 11234743 BOX # LAB # NW181635

SUBMITTED FOR:

CORSON COUNTY FEEDERS

SUBMITTED BY: S00453 **5D WHT GROWERS-MCLAUGHLIN 109 ELEVATOR ROAD BOX 640** MCLAUGHLIN, SD 57642

Date Sampled

Date Received 12/14/2011

Date Reported 12/29/2011

Nutrient In	The Soil	Interpretation	15	it Cro	op Choice	2r	nd Cr	op Choice	3r	d Cro	op Choice
		ygow law Mod Hich	Cone	an Sa	mazi ili		entesp		100	116.50	
100	8 lb/ac 12 lb/ac			<del>\$ 1.00</del>	D GOAL			D GOAL	3.3		Ď GOÁL
			30		Bushels	- 40		Bushels	50	**********	Bushels
And the second	ZQ lb/ac		SUGO	BESTEI	GUIDELINES	SUG	ĢESTE	D GUIDELINES	sực	GESTE	D GVIDELINES
				ha 2 %			370		(a)	vie i	
Sires	12 ppm			A41	APPLICATION		CRE	APPLICATION	Contraction of	4	APPLICATION
Property Commence			3012503.83	61			98			115	No. Of Ch.
	280 ppm	allara (s. 15.		15	Bend		18	Band *	2.0	23	Band *
1,000	12 lb/ac				(Starter)*			Band			Band
344	4 lb/ac			10	Sand (Starter)*		10	(Starter)*		10	(Starter)*
<b>6.24</b>	6 lb/ac			28	Broadcast		28	Broadcast	10	26	Broadcast
				10	Band		10	Band	30	10	Band
žeri (	******	* (P. 1)						·			
	0.36 ppm										
				2	Band	E.	2	Band	.00	2	Bend
er i		7000	4.0								
	· ·			Ó			¢			ø	
					ori Cattorie			25 (27 ) 22 (27 )	111	0 E 5 O 1 A 1 A 1	(pece trange)
Ges c									100		Notes 16 H
A Selle	).25 mmho/cm		6,0								

Crop 1: 61 ibs of C-0-60 = 28 ibs of Chieride" \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil lests. Crop Removal: P205 = 19 K20 = 11 A GVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 61 lbs of 0-0-50 = 28 lbs of Chloride\* \* Caution: Seed Piaced Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 15 A GVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 61 lbs of 0-0-60 = 25 lbs of Chierles" \* Caution: Seed Piaced Pertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 31 K20 = 19 A GVISE Band guidelines will build P & K test levels to the medium range over many years.

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Soil Analysis by Agvise Laboratories Northwood: (701) 587-6010 Benson: (320) 843-4109

### **SOIL TEST REPORT**

SUBMITTED BY: 500453

45 FIELD ID SAMPLE ID 1 COUNTY CORSON

TWP 22-26

SECTION QTR

**109 ELEVATOR ROAD** 

MCLAUGHLIN, SD

**BOX 640** 

ACRES 0

57642

PREV. CROP Grass/Alfalfa

SD WHT GROWERS-MCLAUGHLIN

N E

REF # LAB #

11234817 BOX #

NW183228

SUBMITTED FOR:

WOLF CATTLE CO.

Date Sampled

Date Received 12/27/2011

Date Reported 12/29/2011

Nutrient In The	e Soil	Interpretation	1.5	t Cro	p Choice	21	าย์ Cr	op Choice			p Choice
	B lb/ac	alow Mod High		es/Alfa	iez zak	E G	egirs a		Con	-Sizh	
	6 lb/ac			YIEL	D GOAL	222	Ytel	DGOAL		Alert	GOAL
Ours.	14 lb/ac		2	e e e e e e e e e e e e e e e e e e e	Tons	40	-1111 - EE	Bushels	100	in the second	Bushels
			Sug	SESTE	SUIDELINES	10.27		g Guideuines	suga	ESTEC	GÜIDELİNES
			(a)	id i		13	idos .	Le Line Line		na 💮	
Calebra Processor	2 ppm		LB/A	CRE	APPLICATION		CRE	APPLICATION	, цвух	CR#	APPLICATION
regular de la companya de la company	214 ppm			16			94			106	
				25	Broadcast		31	Band *		51	Bend *
				0			10	Band (Starter)*		10	Band (2x2) *
9.4	6 lb/ac	100 A					······				
Sulfucily		626	36	12	Band		12	Band	ø	12	Band
ere e	0.30 ppm	20040 063057   7232	C.						<b>.</b>		
				2	Band		0			3	Band
Management of the sour											
			100								
Magnesi (n									4.8		
		AV O				2					
	2,7 %			0			0	Vites San Oldonosominosom	Juli 9	0	
Orginate≡ (£ 1). Cangrages (Clark)	27, 70		501164		s phication E	x (1) 2 11	3476	College Asia Institution	77 12 21	O LAND DE	(pical Pange)
9.60 0.2	1 mmhe/cm										** ** ** ** ** ** ** ** ** ** ** ** **
<b>6-26</b> 0.3	5 mmho/cm		6.8								

Crop 1; \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 20 K20 = 96 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2; F Caution: Seed Placed Pertificer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 25 K20 = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: \* Caution: Seed Placed Pertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high spil tests. Crop Removal: P205 = 40 K20 = 27 A GVISE Band guidelines will build P & K test levels to the medium range over many years.

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Soil Analysis by Agvise Laboratories Northwood: (701) 587-6010 Banson: (320) 843-4109

### SOIL TEST REPORT

35-21-25 Field 46 FIELD ID + 35 SAMPLE ID 43 COUNTY CORSON TWP 21-25 26 QTR SECTION

PREV. CROP Sunflower

ACRES 0

57642

SUBMITTED FOR: SUBMITTED BY: \$00453 CORSON COUNTY FEEDERS SD WHT GROWERS-MCLAUGHLIN

> 109 ELEVATOR ROAD **BOX 640**

MCLAUGHLIN, SD

E W

11234742 BOX # REF # LAB # NW181634

Date Sampled

Date Received 12/14/2011

Date Reported 12/29/2011

Date Sampled		Date receive			~~~			e responde 12			
Nutrient In	The Soil	Interpretation	1.5	t Cro	p Choice	2:	nd Çr	op Choice			p Choice
		Yaw buw Med Fian	Wne	al-Sor	eg ÷	m	ealb-Sp	(no (in)			(ng ,
100	9 lb/ac 9 lb/ac				GØAL.	ä	بسبيسن	D GOAL		YIEL	D GOAL
0034	18 lb/ac		30		Bushels	40	*******	Bushels	50		Bushels
Nere	10 10/20		succ	ESTEC	GUIDELINES	SUG	ĞESTE	D GUIDELINES	SUG	GESTE	D GUIDELINES
			1				76			ne l	<b>.</b>
elen.	12 ppm		LB/AC	DESCRIPTION OF THE	APPLICATION	1 37.57	CRE	APPLICATION	LB/A	CRE	APPLICATION
	275 ppm	60 (12) C. S.		63			90			117	
	,			15	Band (Starter)*		18	Band *	Pytos	23	Band *
crioree	18 lb/ac			10	Hand		10	Band	100	10	Band
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Crop 1: 52 lbs of 0-0-50 = 24 lbs of Chloride" \* Caution; Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removel: P205 = 19 K20 = 11 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2; 52 lbs of 0-0-60 = 24 lbs of Chloride" \* Caution: Seed Placed Fertilizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 15 K20 = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 52 lbs of 0-0-60 = 24 lbs of Chloride" \* Caution: Seed Placed Fertifizer Can Cause Injury \* Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P205 = 31 K20 = 19 AGVISE Band guidalines will build P & K test levels to the medium range over many years.



P.O. BOX 510, NORTHWOOD, NO 58247 (701) 587-6010

1 Zem Andor

WULF CATTLE DEPOT

47A & 47B FIELD SAMPLE 1

CORSON COUNTY

21-27 TWP

SECTION 9

QTR.

ACRES

SUNFLOKER PREV CROP

### SUBMITTED BY:

HZ1154

HZB-SDWG-ACLAUGHLIN ZONES ONLY-BRENT

BOX 640

NCLAUGHLIN, SD

57642

W Ξ S 13408649

REF#

11336 LAB#

BOX# 5047

DATE SAMPLED

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0- 65	18 lb/ac	vooracovagosta kasiigise	1	<del></del>	WHEAT		, <u></u> .	DATS			DATS
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V-24*	30 16/ac		SUC		TED GUIDEUNES K Haintenance			TED GUIDELINES MAINTENANCE	SU		ED GUIDELINES ( Haintenance
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			N	78	].	N.	50		l N	70	7
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ron			Fe	160	#46-0-0	Fe	/oo <sup>‡</sup>	46-0-0	Fe	140	446-0-0
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52 LBS OF	0-0-60 = 24 LBS	S OF CALORIDE			····		,				

\* CAUTION: SEED PLACED FERTILIZER CAN CAUSE INJURY \$

Crop Removal: Crop 1: P205= 25 K20= 15 Crop 2: P205= 20 K20= 15 Crop 3: P205= 25 K20= 19 GVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and them maintain them.



P.O. BOX 510, NORTHWOOD, ND 58267 (701) 587-6010

SUBMITTED FOR:

**WULF CATTLE DEPOT** 

### SOIL TEST REPORT

Field 48 FIELD.

CORSON COUNTY

21-27

SECTION 16

SAMPLE Z

ACRES SUNFLOWER PREV CROP

SUBMITTED BY:

MZ1154

6058234440

MZB-SDWG-MCLAUGHLIN ZONES ONLY-BRENT

BOX 640

MCLAUGHLIN, SD 57642

4/ 2/13

COX# 5064

Ν W Ε

p.1

DATE SAMPLED

DATE RECEIVED

TWP

QTR

4/ 1/13

DATE REPORTED

LAB#

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11339

INTERPRETATION 1ST CROP CHOICE 2ND CROP CHOICE 3RD CROP CHOICE **NUTRIENT IN THE SOIL** V LOW LOW MED HIGH WHEAT DATS DATS 0- 6" 18 lb/ac YIELD YIELD YIELD 5-24" 27 lb/ac 40 BU 80 BR 100 BU GOAL GOAL GOAL 0-24" 45 lb/ac 31111111 SUGGESTED GUIDELINES SUGGESTED GUIDELINES SUGGESTED GUIDELINES P & K NAINTENANCE P & X MAINTENANCE P & K MAINTENANCE LB/ACRE APPLICATION LB/ACRE APPLICATION LB/ACRE APPLICATION Nitrate N M Ν 55 Phosphorus 6 ppm \*\*\*\*\*\* 26 Band # P<sub>2</sub>O<sub>5</sub> P2O6 22 Band # 28 Band # P<sub>2</sub>O<sub>4</sub> 358 ppæ \*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Potassium K<sub>2</sub>O 10 Band(Starter): K<sub>2</sub>O Band(Starter): KO 10 Band(Starter)# Chlorine 0-24\* \*\*\*\*\* 12 lb/ac CI 28 Broadcast Ci 28 Broadcast CI 28 **Eroadcast** 10 lb/ac 0- 6' \*\*\*\*\*\*\*\* Sultur S ? Band (Trial) S Band (Trial) S Band (Trial) 6-24" \*\*\*\*\* 24 lb/ac Boron В 4/0-50-0 50 10-50-0 10.50-0 Zino 25-0-0-65 25-0-0-65 25-0-0-45 Fe fron. Manganese Mn Mn 21-0-0-24 21-0-0-24 21-0-0-24 0.54 pp# \*\*\*\*\*\*\*\*\*\*\*\* Copper Cu Band Cu Band (Trial) Cυ Band (Trial) Magnesium Mg Mg Mg Calcium Sodium Lime 0.0 Limei 0.0 Lime 0.0 Organic Matter Cation % Base Saturation (Typical Range) Butter Exchange Capacity

0.30 anho/cm 61 LBS OF 0-0-60 = 28 LBS OF CHLORIDE

0.25 asho/cm

11111

11221512

Carbonate (CCE)

Soluble 0- 6"

Salts 6-24\*

# CAUTION: SEED PLACED FERTILIZER CAN CAUSE INJURY #

% Ca

% Mg

% K

% Na

% H

Crop Removel: Crop 1: P205= 25 K20= 15 Crop 2: P205= 20 K20= 15 Crop 3: P205= 25 K20= 19 SVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and them maintain them.

0~ 6"

6~24"

6.5

Section K: Livestock Feed Management





August 2001

COLLEGE OF AGRICULTURE & BIOLOGICAL SCIENCES / SOUTH DAKOTA STATE UNIVERSITY / USDA

# **Managing Feedlot Cattle** to Reduce Nutrient Waste

by Julie Walker, area beef Extension specialist, and Brad Johnson, 1 Extension ruminant nutrition and beef feedlot specialist, SDSU Animal & Range Sciences Department

inagement opportunities can reduce feed costs and the cost excess nutrient waste outputs. The key to controlling excess nutrient output is controlling nutrient intakes. The question becomes whether nutrient excretion can be reduced without negatively impacting animal performance?

### **Balanced Rations**

Nitrogen and phosphorus are the primary nutrients considered in nutrient waste management systems. Excess nutrient excretion can be controlled by properly balancing diets according to nutrient requirements for production.

The maintenance recommendations for phosphorus (NRC 1996) have been reduced by approximately 43% from 1984 NRC recommendations. The new recommendation is 0.22% P  $\,$ to meet nutrient needs for maintenance and gain of an 800 lb. steer on a finishing diet. Erickson et al. (1998) conducted an experiment to evaluate animal performance across various levels (0.14-0.34%) of P intake. Steer performance was measured as average daily gain (ADG), dry matter intake (DMI), and feed efficiency. These variables were not affected by P level in the diet. This suggests that when steer diets are balanced, producers can lower the P levels in the diet to the 1996 NRC commendations without negatively affecting performance.

Most corn-based diets average 0.28 - 0.32 % P, exceeding the requirement for an 800 lb steer. The challenge then becomes lowering the phosphorus concentration of a corn-based diet.

Typically feedstuffs other than corn are needed to lower the phosphorus concentration of the diet. Comparing phosphorous book values of whole grains (barley, oats, sorghum, and wheat), corn has the lowest phosphorus level. Therefore, the best possible management alternative is to minimize additional supplementation of phosphorus.

Forages are typically lower in phosphorus than concentrates. However, lowering the ration P concentration by increasing levels of forage has the disadvantage of decreasing gains.

Protein (nitrogen) requirements can be divided into two segments, protein needed by the microbial population in the rumen and protein needed by the animal. Degradable intake protein (DIP) is the protein used to meet the microbial requirement and the animal requirement can be met by microbial protein leaving the rumen and by undegradable intake protein (UIP). Excess DIP is converted to ammonia and excreted in the urine.

Protein requirements change as the animal grows. There is an opportunity to reduce crude protein level of the diet. When a ration is balanced using DIP and UIP, usually the crude protein of the ration is lower than when balanced with crude. protein levels.

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Feedstuffs vary in the amount of protein degraded in the rumen (DIP) versus small intestine (UIP). For example, dry-rolled orn is 40% DIP and high-moisture corn is 60% DIP with the me amount of crude protein (8-10%).

Protein sources also vary in DIP percentages, such as soybean meal 65%, cottonseed meal 57%, feathermeal 30% and fishmeal 40%. By using a variety of feedstuffs, UIP, and DIP requirements can be met at lower crude protein levels in the diet, thus reducing nitrogen excretion.

### **Phase Feeding**

Phase feeding is a systematic method for adjusting the animal's diet during the feeding period to meet its nutrient requirements. Since nutrient requirements change as cattle grow, protein and phosphorus requirements can be reduced as an animal matures. This suggests the opportunity to reduce nitrogen and phosphorus intakes and excretion.

An experiment was conducted by the University of Nebraska to evaluate phase feeding with yearlings and calves. The concentrate portion of the diets was comprised of dry rolled corn, high moisture corn, or corn bran. Control (CON) steers consumed a diet of 13.6% CP, 4.48% UIP, and .34% P compared to a balanced (BAL) yearling diet that was systematically reduced 'uring the feeding period from 11.9 -11.2 % CP, 3.67% UIP,

d.24-.22 % P. Yearlings fed the balanced diet consumed tess dry matter than the control steers (Table 1). However, no differences in ADG, feed efficiency, or carcass characteristics (data not shown) were found.

The second experiment involved calves. The control diet was 13.4% CP, 5.16% UIP, .35% P compared to the balanced diet (12.7-10.8% CP, 5.51-3.02% UIP, and .26-.20% P), which was phase-fed in 8 finishing diets. Calves fed the balanced diet had similar DMI, ADG, and feed efficiency as control calves (Table 1).

Table 1. Feedlot performance for yearlings and calves fed control or balanced rations.

	YEAF	RLING	CALVES			
ITEM	CON	BAL	CON	BAL		
Initial Wt., Ib	652	660	539	542		
Final Wt, Ib	1249	1249	1245	1247		
DMI, Ib	26.2	25.0*	20.6	20.5		
ADG, Ib	4.06	4.01	3.66	3.65		
'G	6.45	6.21	5.72	5.64		

Erickson et al., 1998

Phase feeding yearling steers reduced N and P excretion by 16 and 44% respectively (Table 2). This indicates improved nutrient output (i.e. lower N and P excretion) can be achieved without compromising animal performance.

Table 2. Nitrogen and Phosphorus Balance for yearlings.

1	NITR	OGEN	PHOSP	HORUS
	CON	BAL	CON	BAL
	Lbs/	hd/d	Lb:	s/hd
Intake	.56	.47*	12.52	7.90*
Retention	.06	.06	2.05	2.03
Excreted	.50	42*	10.47	5.87*

Erickson et al., 1998

Phase feeding allows nutritionists to more effectively optimize performance without overfeeding. This improvement was demonstrated by reducing intake thus reducing potential feed costs. Additional cost savings could be realized by reducing the amount of nutrients excreted in animal waste.

A practical disadvantage of phase feeding is constantly changing diets. Phase feeding increases management requirements to ensure proper delivery of the correct diet. The risk of metabolic disorders that could occur with improper diet changes is increased in these systems.

### **Implants**

Anabolic growth-promoting agents, commonly referred to as implants, are approved for use in steers and heifers targeted for harvesting. Characteristics of implanted cattle are enhanced growth rate, feed efficiency, and lean tissue accretion. Implanting steers on finishing diets has improved gains by 8-20% and feed efficiency by 5-15%. With implanted heifers, gains were increased 10-20% and feed conversion improved by 7-12%.

The increased tissue accretion suggests the possibility of reduced nutrient excretions. An example from Johnson et al. (1996) showed that the animals implanted with trenbolone acetate (TBA) + estradiol (E2) increased ADG by 18% (Table 3) during the 40 day period, suggesting that nitrogen and phosphorus retention would be higher in the implanted animals. Table 4 shows that the amount of nitrogen retained in the carcass was increased by 82% during the first 40 days for implanted animals. Similar intakes were observed in this study; therefore, the amount of nitrogen excreted would be less from implanted animals compared to control animals. Table 5 illustrates calculated estimates for reducing phosphorus excretion by implanting during the first 40 days. Phosphorus is needed for both maintenance

<sup>\*</sup> P < .05

<sup>\*</sup> P < .01

(Pm) and gain (Pg). Since the maintenance requirement is calculated from body weight, implanted animals have a slightly bigher requirement. Phosphorus for gain is calculated as 3.9 g per 100 g of protein gain or 5.54 g P/d and 10.10 g P/d for atrol and implanted animals, respectively.

Since true absorption of phosphorus is 68%, 18.3 g P/d and 25.1 g P/d were needed by the control and implanted steers to meet their phosphorus requirements for maintenance and gain. The phosphorus balance calculations indicate potential for reduced phosphorus excretion.

Table 3. Feedlot Performance for initial 40 days of finishing period

ITEM	CONTROL	IMPLANTED
Initial Wt., Ib	869	869
Days 0-40		
ADG, Ib	3.89	4.58*
F/G	5.47	4.83*
DMI, Ib	21.3	22.2
P Intake, g/d	26.14	27.19

anson et al., 1996

P < .05

Table 4. Effect of TBA + E2 on Carcass Nitrogen

ITEM	CTL	IMP	CTL	IMP	%Response
		take, /d		ass N ı, g/d	
Days 0-40	186	193	18.2	33.1	82 <del>* *</del>
Days 0-115			18.9 25.3		34*
Days 0-143			18.2	22.7	25 <b>*</b>
Days 41-115	192	210	19.5	20.3	4
Days 116-143	179	201	11.5	18.2	58

Johnson et al., 1996

Table 5. Phosphorus Balance for first 40 days

ITEM	CONTROL	IMPLANTED
P Intake, g/d	26.14	27.19
Pm, g/d	6.89	6.99
Whole Body Protein Gain, g/d	142	259
Pg, g/d	5.54	10.10
P Excreted, g/d	20.6	17.09
Estimated requirement, g/d	18.3	25.1
P Excess, g/d	7.8	2.09

Calculated from Johnson et al. 1996 data.

### Summary

Ration balancing allows producers to manage the nutrient intake for optimum performance and minimizing nutrient output. Adjusting rations throughout the feeding period reduces potential of overfeeding of nutrient such as nitrogen and phosphorus. Use of implant and other growth enhancers permits for improvements nutrient retention, thus reducing nutrient output.

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<sup>\*\*</sup> P < .01

<sup>\*</sup>P<.10

Section L: Odor and Insect Pest Control

# RECOMMENDED STRATEGIES FOR ODOR CONTROL IN CONFINEMENT BEEF CATTLE OPERATIONS

Kent Tjardes<sup>1</sup>, Alvaro Garcia<sup>2</sup>, Hans Stein<sup>1</sup>, Charles Ullery<sup>3</sup>, Stephen Pohl<sup>3</sup>, and Christopher Schmit<sup>4</sup>

<sup>1</sup>Animal and Range Sciences Department, <sup>2</sup>Dairy Science Department, <sup>3</sup>Agriculture and Biosystems Engineering Department, and <sup>4</sup>Civil and Environmental Engineering Department, South Dakota State University, Brookings, S.D.

Odors coming off a beef feeding operation are generated from three different sources: the feedlot facility, waste storage, and the land where the manure is applied. In some operations, the feedlot facility may also serve as the primary waste storage area. To reduce the total amount of odor generated from a beef feeding operation, odor generation and emission by each of these three sources needs to be reduced.

Several options for odor reduction are available in each area. Only practices that are proven to be effective and that can be immediately implemented in new and existing facilities are listed in Table 1. Other options are currently being developed or tested; continued research will reveal whether they can be successfully implemented in the future.

The table is organized in four sections covering practices to reduce odor generation, reduce odor emission from facilities and storage units, increase odor dispersion, and reduce odor emission from manure application. For each practice, advantages and disadvantages are listed. The effectiveness and the cost of implementing each practice are indicated using odor generation from a standard beef feeding operation as a base line. The base line operation is assumed to be dirt-lot with no slope, no additional manure storage structure, and no dietary modifications to reduce odor generation.

The effectiveness of each practice is indicated as "low," "moderate," or "high." A low effectiveness is assumed to reduce odor generation by less than 20%; moderate, 20 to 50%; and high, more than 50% relative to the base line operation. These values relate only to the specific area in which the practices are used.

Some practices in the table are listed as best management practices (BMP). These are practices with a well-documented beneficial effect on the sustainability of a production system. Their implementation should be encouraged even without considering their potential for reduction of odor emission.

The cost of each practice is indicated. A "low" cost is assumed to be less than \$0.50 per head marketed (steer or heifer), "moderate" adds \$0.50-\$1.50 per head, and "high" adds more than \$1.50 per head to total production costs as compared to the base line unit.

Ag/Biosystems Engineering Department • Cooperative Extension Service • South Dakota State University

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### Final Recommendations

The most common beef cattle feeding facilities in South Dakota are dirt lots. Simply modifying management practices, such as balancing diets properly, keeping the lots dry by providing adequate slope and manure removal, and incorporating manure as quickly as possible following application, can reduce odors emissions from these types of facilities. Other practices listed also should be considered for greater levels of odor control.

For cattle confined in a building, a biofilter may be considered. This is an inexpensive, environmentally friendly system producers can construct. It is made from a compost-woodchip mixture that, when moistened, captures and contains many common odors. It is attached to an exhaust fan, and when air is directed through the compost mixture, it traps up to 96% odor-free air.

Research in the area of odor reduction is ongoing and many new technologies are being developed. As independent research using these technologies become available, some of them may prove to be even more effective than the once listed above.

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Table 1. Odor reduction practices for beef feedlots

		nts		ion offset	nsidered a	on offset	nsidered a			·· <u>···</u>	Jo,	offsets
		Comments		Returns in production offset	RMP	Returns in production offset	costs. Should be considered a	BMP.			Improved efficiency of	nutrient utilization offsets
	Cost			row -		Low		Low			Low	
	Effectiveness		Low to moderate			Low to moderate		Low			Low	
	Disadvantages	Generation	None		Possibly more labor	יייין יייין אייין איין אייין איין א		It requirements are underfed,	depressed		Dependent on weather and timely availability of	harvesting equipment
	Advantages		Decreased N excretion with	requirements.	Overfeeding crude protein	(CP) avoided. Efficient	Stiffur everetion against	reduced production of	hydrogen sulfide and other	Reduced spoilson Increased	efficiency of feed utilization.	
	Lescription	Honding of	requirements (phase feeding).	Dolones II. o	demide alers for protein	crude protein.	Avoid overfeeding sulfur			Avoid ensiling forages with	excess moisture. Adjust feed-out face to minimize serohic	exposure,
Practice		a. Diet manipulation	TOTAL TANK							b. Feed preservation		

Table 1. Odor reduction practices for beef feedlots (cont.)

Description			•			
*140,100	Description	Advantage				
		, vavadages	Disadvantages	Effectiveness	130	
a. Animal housing			Emission		Cost	Comments
1. Earthen lots						
(with or without sheds)	4. Adequate stope	Keeps lots dry to reduce microbial activity	Need collection for nmoff	Moderate	Low	Waste management issues
	b. Oil treatment	Prevents dust and may prevent respiratory irribations in cattle	Increased cost of product and application	Low	Low to	may need to be addressed Some of the cost may be
2. Concrete lots with sheds	a. Scrape manure often	Reduces volatilization	Increases labor	Modera	moderate	offset by improved performance
	b. Bedding	May reduce volatilization of	Increased cost of bedding,	Moderate Low to moderate	Low	Should be considered a BMP
3. Solid floor building	a. Deep pack	May reduce volatilization of nitrogen and sulfin	Increased cost of bedding,	Low to moderate	Moderate	More recessorit with these
4. Slatted floor building	a. Biofilters. Air is exhausted	Very effective	Cost and building and labor		<del> </del>	building types need to be
	through a biofilter. Materials:  Mixtures with 30% to 50% of		prevent use	Moderate	Moderate	Lameness and reduced
	compost (by weight) and 70% to 50% of wood chins					performance may be a problem with long days on
<ul> <li>b. Manure storage</li> </ul>						Dagi
1. Earthen basins (single or	Covers:	High nutrient retention	Difficult to cover evenly Com			
oracio can)	Natural crust	-	must be taken during agitation	reduction of the High	Ľow W	Odor potential if slurry is not
	Bio-covers (straw)		and pumping (particularly with increasing covers) With	Bio-covers: High	Low	may limit design options.
	morganic (geo-textie, clay balls, plastic cover)		plastic covers air can exhaust through a bio-filter	vers:	Moderate to	Effectiveness highly dependent on proper management
2. Steel or concrete tanks above or below ground:	Covers:				high	
1	<ul> <li>a. Impermeable (PVC, wood, concrete)</li> </ul>	Duration (10-15 years)	Cost	a. Impermeable: High	Moderate to	Impermeable cover; A bio-
	b. Permeable (straw)	Cost	Duration, Sometimes difficult to maintain afloat		nigh	filter needs to be added at the end of the vents to treat
3. Solids separation	Solids separated from liquids through sedimentation basins or	May reduce odor/ammonia. Easier agitation and pumping.	Capital/operational costs;	Moderate	Moderate	exhaust gases Adds another "waste" source
4 Aeration	mechanical separators					to oe managed by the producer
r retainen	An is forced into frict manure storage system. Aerobic bacteria oxidize odorous compounds to carbon dioxide and water	Keduces methane, hydrogen sulfide, ammonia and volatile fatty acids.	Added utility costs, Requires power to aerate the materials	Moderate	Moderate	
5. Methane digesters	Treats waste with 3-10% solids. Biogas methane produced to maintain digester temperature	Generation of electricity.	Currently suitable for dairies with 1,000 animal units or more. Likely requires slatted	High	High	Limited data
			floor building			

Table 1. Odor reduction practices for beef feedlots (cont.)

Draction						
LYACHCE	Description	A distant		,		
		Auvaniages	Disadvantages	Effectiveness		
a Ottolia f. f.		ritio.	Sitting/Dienorgion	20000	Cost	Comments
4. Shellerbelts	Creates barrier of vegetation for	Holy d	B Dispersion			
	dust and odor compounds.	odors. Cost. Environment.	Planning and time required for effective barrier to grow,	Low	Low	The most cost effective adve
b. Windbreak walls	Solid or porous wall 10 to 15 feet	Aesthetics	4019 O 101			dispersion method.
	from the exhaust fans causes dust	Napid implementation, Help disperse and dilute odors,	Cost. Aesthetics. Need for Defiodic cleaning of dust from	Low	Low to	Recent and on-going receased
c. Setback distances	Optimize distance between order	Trap dust particles	porous walls		moderate.	but needs more
	emission sources and urban areas	Complaints less likely	Not applicable for dairies	High	Variable.	Recent and on-oning recent
			Certainty in Operation			but needs more
		Lang T	A			
a. Manure incorporation	Manue is rapidly incorporated in	Reduces odor and	Land Application			
*	the soil after spreading with	emissions	Requires some degree of management by the producer	Moderate	Moderate	Most research has been done
h Manure injection	Moming is injusted in the					in Europe. More research on
O TOTAL MACEUM	(Shallow and deen)	Reduces odor and ammonia	Cost	High	Low	odor emission needed
	(4	critisalons			3	in Europe More research on
c. Band spreading	Manure is discharged at ground	Reduces odor and arrimonia	Manue must be residi.	1		odor emission needed
	level through a series of trailing	emissions	incorporated	Tow	Low	Most research has been done
	pipes					in Europe. More research on
						odor emission needed
						-

# Identifying and Controlling Flies

On dairy, beef, other livestock and pets

W.L. Gojmerac

Among the more common flies associated with livestock are the house, face, stable, horn, deer and horsefly. Before starting control procedures, it is important to accurately identify them since their behavior, life cycle, and sites where larvae develop are different. For example, horn and face fly larvae develop only in fresh cow manure in the pasture, deer and horsefly larvae in swamps, and house and stable fly larvae in decaying organic matter. The following descriptions will enable you to identify the type of fly which is causing problems.

### Identification

### House Fly

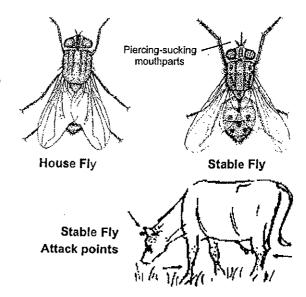
Description: The house fly is well known because it is generally near human and animal habitations. The fly is gray in color with four dark stripes down its back and the face is slightly straw colored. It feeds with a swabbing type mouth rather than a blood-sucking type. The house fly is about 1/4 inch long. While most important as a disease carrier, house flies also disturb cattle. They are most active on hot, sunny days.

Life History: Adult flies become active in April and May and lay eggs in batches of 100–150 in manure and garbage. Up to four layings have been noted. Eggs hatch in about 24 hours. Maggots have fully grown in about 7–10 days and then pupate. At the end of the pupation period, flies emerge and in several days lay eggs. In hot weather, populations increase rapidly because the life cycle requires only 10–14 days; but during cooler periods, the life cycle may be as long as 2–3 months. Normally the maggots or pupae overwinter, but often adults survive in heated buildings or barns.

### Stable Fly

Description: The stable fly is similar in appearance and size to the house fly except that it has well-developed black, piercing-sucking mouth parts. The back and abdomen have several large spots on them. When not on cattle, the stable fly likes to rest in the shade on wooden posts, trees, and buildings. The stable fly prefers to attack active animals rather than those at rest. Ears and legs of cattle are the parts most often fed upon, and without control, numbers of flies are particularly noticeable on the legs of cattle. The stable fly generally feeds upwards, and attacks cattle only during the day.

Life History: Stable flies lay their eggs in manure and decaying vegetation. Egg laying is started only after the female has consumed three blood meals which may be as soon as 9 days after the fly emerges. The cycle from egg to adult takes about a month and there may be several



generations per year. Maggots and pupae overwinter in strawy manure.

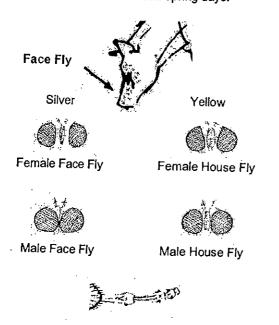
### Face Fly

Description: In size and appearance the face fly is nearly identical to the house fly and it takes an expert to distinguish between them; however, the face fly can usually be identified by its location on the cow. Face flies congregate in large numbers around the heads of cattle, particularly those moist areas caused by tears and saliva. This is very annoying to a cow and can cause reductions in weight gains or milk production. Pink eye and blindness in cattle are believed to be spread by this fly as it swabs up mucus and moisture about the eyes. In summer the face fly often rests in the sunlight on wooden posts and feed bunkers where cattle are kept,

There is a positive method for distinguishing between face flies and house flies, but it is necessary to catch the fly. The female face fly has a silvery face; the female house fly has a yellowish face. Females can be distinguished by squeezing their abdomen. This causes the ovipositor or egg laying structure to extend from the tip of the abdomen. No similar structure is present in males. The eyes of male face flies almost meet in the center of the head but the eyes of the male house fly are well separated. With a little practice, it becomes unnecessary to capture the fly to make such distinctions.

Life History: The life cycle of the face fly is nearly identical with that of the house fly, except that a face fly can lay as many as 1500 eggs in its life span. Eggs are laid and

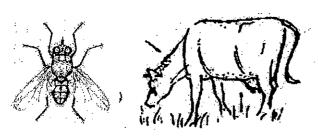
larvae develop in fresh cow manure in pastures. The fly often overwinters in houses and when numerous become a household pest on warm winter and spring days.



## Ovipositor Extended Horn Fly

Description: The horn fly is about half the size of a house fly (slightly more than 1/8 inch), dark gray in color, and has piercing-sucking mouth parts. The horn fly remains on cattle day and night, leaving only to lay eggs in freshly dropped cow manure. Horn flies feed primarily on withers, around the horns, and along the back. They generally feed facing downwards. During hot weather or rains, the flies may move to the belly and on cool nights may cluster around the udder. The adults live about 3 weeks and feed exclusively on cattle blood. The annoyance caused by horn flies causes milk production and weight gains to be reduced.

Life History: Horn flies lay their eggs in fresh cow manure where the maggots can feed. The eggs hatch in about 20 hours and maggots develop for about 5 days before pupating. At the end of a 5-day pupation period, the flies emerge and within 3 hours begin feeding on a cow. By the third day the females can begin laying eggs. Only about 20 eggs are produced per batch, but a female may lay up to 400 eggs in her lifetime. Maggots and pupae overwinter in manure.

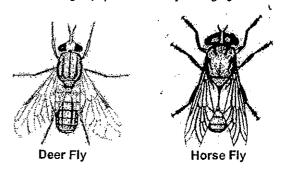


Horn Fly

### Deer Fly

Description: Deer flies are a little larger than house flies and the body is yellow with brown stripes. The wings have conspicuous brown bands and the mouth parts are the piercing-sucking type. Deer flies are heavy feeders, and wounds they make by feeding may bleed after an attack. They are daytime feeders and most active on hot days.

Life History: Eggs are usually attached to vegetation above water or moist ground. Upon hatching, the larvae drop into the soil and spend one to several winters here, before maturing in pupae and finally emerging as adults.



### **Horse Fly**

Description: Horse flies are the largest and most easily recognized cattle pests in Wisconsin. There are several species of horse flies in Wisconsin; however, all can be recognized as horse flies by their large size, their large rounded eyes, and the loud buzzing they make while in flight. The females have large, piercing-sucking mouth parts which inflict painful wounds. The males are harmless flower feeders. Biting is usually confined to the back with only a few flies on a cow at one time. They attack cattle only during the day and are most active on hot days.

Life History: See deer fly.

### Control

### **Livestock Operations**

Good sanitation is required if house and stable fly population are to be kept at a minimum. Weekly cleanout of calf pens, hutches and box stalls is a must. Don't forget the accumulated feed, especially under drinking cups.

Flies can and will breed in manure that accumulates in exercise yards around feed bunks, fence lines and any place not trampled by cattle. If cattle are kept in the exercise yard during the summer, you will have more fly problems than if cattle are pastured away from farm buildings—manure handling and feed storage facilities will require special attention.

Health and milk quality control officials specify how often gutters should be cleaned. But remember, flies also breed in decaying feed, in manure that accumulates around sprockets of the bam cleaner and in recesses, corners and crevices where manure has accumulated longer than one week.

### **Dairy Cattle**

The selection of fly sprays for use on dairy cattle is important. Using the wrong product could not only injure the animal, but might contaminate its milk with an illegal residue. Products approved for use on dairy cattle by state and federal authorities are safe and will not contaminate milk when used properly. Be sure the label states this approval and follow directions exactly.

Several coumaphos (CO-RAL), dichlorvos (Vapona), permethrin (Ectiban, Atroban), pyrethrins and tetrachlorvinphos (Rabon) products are available and registered for use on dairy cattle. They can be purchased as a ready-to-use mixture or as a concentrate to be mixed with water. Naled (Dibrom) can be used in the dairy barn but not in the milk room or milk house. Coumaphos (CO-RAL), malathion, methoxychior, permethrin (Ectiban, Atroban) and tetrachlorvinphos (Rabon) dusts are also registered.

Although dusts are available and registered for use on dairy cattle, some milk-marketing organizations object to their use. Check with your local fieldmen before using them. Dusts applied directly to cattle have been effective only on horn flies.

Cattle can be self-treated as they enter or leave the barn, hand sprayed, or the barn can be mist- or fog-treated while the cattle are inside. Do not individually treat cattle and mist/fog barn at the same time. Follow directions on the container exactly. Observe all safety precautions. If face flies are a problem, give special attention to spraying head and shoulders.

Back rubbers are an effective way to treat cattle not regularly coming into the barn. Use only those products approved for backrubber use on dairy cattle, such as permethrin or coumaphos (CO-RAL). Follow mixing directions on the label.

DO NOT MAKE YOUR OWN COMBINATION PRODUCTS BY MIXING INSECTICIDES.

### Milkhouse and Egg Handling Room

Hand spray or fog with dichlorvos (Vapona) or pyrethrins when necessary. Use the same dosage listed for dairy cattle. Do not contaminate food handling utensils. The dichlorvos (Vapona) strip can be used. But do not use it in kitchens or in food handling and processing establishments where there is exposed food. Sticky fly strips or papers can also be used where appropriate.

Electronic ultrasonic repellers are supposed to "drive away" pests and not harm the good animals. These devices simply don't work.

Electrocutors and light traps will kill insects when employed properly. Some are designed to intercept night-flying insects entering a food plant that are attracted to light. Others are designed to monitor insect populations. This is far different than trying to control insects, such as flies, which are not hightly attracted to light. There is no question that some flies will be electrocuted when they contact the exposed wires, but the number killed is a very low percentage of flies in the area. So for practical purposes, electrocutors and light traps are of no value.

Buying and releasing beneficial, parasitic or predator insects is an excellent way to control pests, but this technique works only in a very limited number of situations, and managing this process is a highly complex operation. The U.S.D.A. studied fly populations on feedlots and dairies. Researchers reported no differences in adult populations of flies on those farms releasing parasites when compared to the other farms.

### **Livestock Barns**

Diazinon (WP), dimethoate, fenthion (Baytex), malathion, naled (Dibrom) permethrin (Ectiban, Atroban) and tetrachlorvinphos (Rabon) can be used in livestock housing.

As a routine precaution, remove all livestock from the building being sprayed. Spray the walls and ceilings with insecticide. Repeat when flies no longer drop from the surface because insecticide has lost its toxicity. Insecticides are generally non-toxic or useless if applied to a concrete or brick surface—improved performance is obtained by painting or whitewashing before spraying. Some insecticides can be mixed and applied with whitewash. Do not spray exposed Styrofoam insulation with the insecticide mixture.

### Feed Additives to Control Flies

Several products are approved for use as a feed or mineral additive or in a bolus to control flies. They are diflubenzuron, phenothiazine, methroprene (Altosid) and tetrachlorvinphos (Rabon). These chemicals pass through the digestive tract without harm to the animal and leave no illegal residues in the meat and/or milk when mixed and fed according to manufacturer's directions. Enough insecticide remains in the manure to kill or prevent flies from completing their development.

Tetrachlorvinphos (Rabon) is registered for use in dairy as well as beef animals, while phenothiazene is approved only for beef animals.

The insecticide must be mixed with either the feed concentrate or mineral mixture. The animal must consume a specific amount of feed-insecticide or mineral-insecticide mixture daily. For example, tetrachlorvinphos is registered to be fed at 70 milligrams per 100 lbs. of body weight per day. You need to know the weight of the animal being fed and the amount of feed consumed each day by this animal. Based on this information your feed dealer and/or chemical supplier can determine the quantity of stirofos to be mixed into your feed.

### Bolus

To control developing flies (maggots) in manure, uniform quantities of insecticide must be present at all times. A bolus containing diflubenzuron (Vigilante), when placed in the animal's stomach, will constantly release insecticide all season, at concentrations adequate to kill developing flies. The bolus can be administered with a standard balling gun. Small animals require 1/2 bolus; medium animals, 1 bolus; and large animals, 1 1/2 boluses. This product is approved for beef as well as dairy animals.

### Ear Tags

Insecticide-impregnated ear tags have been approved for use on dairy and beef animals. Be sure tags are attached correctly. They are very effective in controlling horn flies, only moderately effective in reducing numbers of face flies, and are much less effective against house and stable flies.

### **Beef Cattle**

Primary pests on beef cattle are horn, face, deer and horse flies; and mosquitoes. Currently there is no practical control for deer and horse flies or mosquitoes. Face flies are also difficult to control. However, the horn fly is easy to control, and the farmer has a choice of insecticides. Use the proper dosage; follow all safety precautions; and if cattle are to be sold for slaughter, observe the proper withdrawal periods. These products can be applied by spray, backrubber or self-treating dust bags.

### Other Animals

While flies generally do not bother hogs, chickens, and rabbits, and horses and dogs are not involved in human food production, fly control is still important. Flies are considered a public health nuisance and health authorities can force you to take action.

If you are involved with these animals, recognize your responsibilities. Decaying organic matter such as manure, unconsumed food, spilled food, or wet bedding can help produce large quantities of flies. Do not rely on insecticides. Sanitation can replace insecticides, but insecticides will not replace sanitation. Generally the most practical solution is a compromise.

When using insecticides near and around animals:

- a. Read and follow label directions exactly.
- b. Do not apply any insecticide directly on an animal unless the label specifically states the animal can be safely treated.
- c. When using any insecticide near the animals, be aware of the animals' normal or natural behavior. Horses can be frightened by a spray; cats, by their normal grooming, might ingest chemicals applied to their fur; and birds might pick up fly or roach bait, or they may try to alight on a suspended dichlorvos (Vapona) strip.

### Recent Changes

Under current federal regulations, insecticides are not permanently registered. The Environmental Protection Agency reviews the current research data base, and if it is incomplete, the EPA can require the manufacturer to provide additional data to support the registration claims. If there is evidence that the insecticide causes an unreasonable adverse effect on the applicator, animal, food product or environment, the EPA can require modified directions on the label.

The manufacturer has several options: 1) provide the required data to support registration; 2) withdraw certain uses; or 3) withdraw the registration and stop making and selling the product.

Unless there are questions of safety and/or serious illegal residues, existing supplies of the product may be used.

Several popular insecticides are now being phased out or having uses withdrawn because the manufacturers believe the cost of supplying the data won't be recovered from product sales. You may find that your favorite product is no longer available, or that you may no longer use it to control a specific pest.

Therefore, it's important to 1) buy only reasonable quantities of any insecticide at one time, and 2) deal with responsible suppliers handling only currently registered products.

### Resistance

In some parts of the United States, flies have developed a high degree of resistance to the pyrethroid insecticides such as cyfluthrin, cypermethrin, cyhalothrin, fenvalerate and permethrin. If you have fly-control failures with pyrethroid insecticides, consider using phosphate products (a different class) such as coumaphos, diazinon, dichlorvos or tetrachlorvinphos.

### Buying an Insecticide

Consult a knowledgeable person when buying insecticides-mistakes can be costly. When in doubt, contact the State Department of Agriculture, Trade and Consumer Protection. It is responsible for administering and enforcing Wisconsin insecticide laws.

See publication A1991, Controlling Mosquitoes for recommendations for mosquito control; and publication A1235, Spider Control in Homes and Barns, for spider control.

University of Wisconsin-Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914 Acts of Congress; and provides equal opportunities in employment and programming including Title IX requirements.

W.L. Golmerac is professor of entomology, College of Agricultural and Life Sciences, University of Wisconsin–Madison and University of Wisconsin–Extension, Cooperative Extension. We extend appreciation to O.L. Lovett and Wisconsin State Department of Agriculture, Trade and Consumer Protection for the illustrations and descriptions of flies.

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Section M: Operation & Maintenance, Holding Pond Pumping and Emergency Plan

### **M.OPERATION & MAINTENANCE GUIDELINE**

The owner acknowledges responsibility for the proper operation and maintenance of the animal waste management system. Although the design is based on the best available technical knowledge, it must be recognized that any system creates some risks, and therefore needs to be properly operated and maintained, including periodic inspection. In addition, maximum efficiency cannot be obtained unless the system is properly operated and maintained so that it will function safely in its intended manner.

Recognizing this, this Manual has been prepared as a general guideline for operating and maintaining the system. This Manual is not inclusive of all of the provisions of the General Water Pollution Control Permit for Concentrated Animal Feeding Operations, therefore the owner should review the permit in its entirety.

It is recommended that the following list be reviewed and be used as a checklist to ensure major elements of operation and maintenance are consistently being observed.

### I. General Considerations

- A. Any discharge from the waste management system or land application sites must be reported as soon as possible, but no later than twenty-four hours after the discharge was discovered. The discharge must be reported to the EPA at (303) 293-1788.
- B. All inspections should be documented on the forms included with this manual or other suitable forms. Documentation must be maintained on site and be made available to the EPA when requested.
- C. Travel of vehicles and livestock should be confined to designated areas to prevent erosion and enhance vegetation.
- D. Maintain grades around containment structures to assure positive surface drainage away from the structures in all directions. Fill any settled areas which may collect water.
- E. Any discovered damage to any facility component must be repaired as soon as possible to original specifications.
- F. Do not allow trees to grow adjacent to holding ponds, to avoid root damage to the structures.
- G. Manage vegetation growth on and near facility components so that adequate component inspection is possible.

Revised: September, 2020

Wulf Cattle Depot Corson County, SD

- H. Control vegetation growth on the holding pond interior below the maximum operating elevation to prevent liner damage from roots.
- I. Maintain the overall system (i.e. pens, building covers, diversion channels, stacking pads settling basins and risers) to ensure that all contaminated runoff enters the containment structures.
- J. The entire feed storage area must be managed to minimize both seepage from any high moisture feed and runoff from the area. Silage piles shall be covered as soon as possible after the feed is harvested and uncovered as the silage is fed.

### II. Waste Application Considerations

- A. Routinely monitor the level of the pond to assure there's enough storage remaining (plus freeboard) to hold the designed volume of a 25 year 24 hour storm event. This maximum operating level is marked on the staff gage in Holding Pond 4. Land application must be planned and carried out to prevent holding pond levels from rising above the maximum operating elevation. In the event that this level is exceeded, the producer has 14 days of possible land application days to restore the pond to a level at or below the maximum operating elevation.
- B. Plan ahead and use the "Plan for Pumping feedlot Runoff Holding Ponds" following this section for additional information.
- C. Whenever possible, apply downwind from any residences. Avoid applying on calm, humid days, since these conditions restrict the dispersion and dilution of odors. Application on weekends or holidays, when people in the area are more likely to be outdoors, should also be avoided.
- D. Do not apply waste on snow or frozen ground unless unavoidable. Consult the General Permit for conditions that must be followed in these circumstances
- E. Do not apply waste material immediately after rain or within twelve hours of forecasted rain unless it can be immediately incorporated into the soil.

### III. Inspection and Documentation

- A. Items to be Performed Daily
  - 1. Year Round
    - a. Record any measurable precipitation.
    - b. Record the date that livestock are brought in to and removed from the facility.

- 2. During Periods of Land Application
  - a. Record the days each field is applied to, as well as weather conditions including; temperature and wind speed and direction.
  - b. Inspect and record the condition of the land application fields being used.
  - c. Inspect and record the condition of all land application equipment being used.
  - d. Inspect and record the condition of the holding pond liner and embankment near the pump intake if pumping is taking place.

### B. Items to be Performed Weekly

The entire Waste Management System must be inspected weekly. This includes but is not limited to the following.

- 1. Record the depth of water in all evaporative ponds.
- 2. Inspect risers and pipe to ensure they are not plugged or damaged. Clean any significant sediment build up as soon as possible.
- 3. Inspect evaporative ponds for signs of leaking or seepage, excessive settling, excessive vegetation growth or damage due to vehicles or equipment, rodents or erosion. Report any leakage as detailed above and make plans to rectify any problems as soon as possible.
- 4. Inspect fences and safety signs around facility, if applicable, to ensure they are present and in good condition. If necessary repair immediately.
- 5. Record any livestock mortalities and how the carcasses were properly disposed of.(i.e. rendering service receipt, location of burial, etc.)

### C. Items to be Performed Annually

- 1. Conduct soil and manure nutrient testing as required by the Nutrient Management Plan.
- 2. Prepare an annual Planned Manure Recommendations based on current
- 3. Prepare and submit an annual report to the EPA.

### IV. Items pertaining to the control of odors, flies and other nuisances

- A. As much as is reasonable, standing water and wet pen conditions shall be prevented or eliminated by routine pen maintenance.
- B. Mortalities shall be promptly disposed of in an appropriate manner (incineration, burial, etc.).
- C. Feed storage and bunk areas will be managed to as much as possible prevent

disposed of properly (i.e. field applied, dried and stockpiled, buried, etc.).

D. If insects become problematic, a pesticide program will be undertaken for control.

### V. Record Keeping

- A. The following items should be kept on site at all times.
  - 1. Copy of the approved <u>EPA Permit</u> Application.
  - 2. Copy of current nutrient management plan.
- B. The following items should be kept on site for a period of 5 years from the date they are created.
  - 1. Inspection reports from all inspections listed above.
  - 2. Soil and manure nutrient test results.
  - 3. Calculations of allowable manure application rates and actual rates applied.
  - 4. Documentation of any action taken to correct deficiencies.
  - 5. Documentation of any discharge, steps taken to minimize it and the estimated volume discharged.

I have reviewed the above Operation and Maintenance Manual for my Waste Management System and agree to provide the necessary resources to properly implement its provisions.

down of drafter	09/28/2020
Operator	Date

### **Plan For Pumping Holding Ponds**

Operat	tor Name Wulf Cattle Depot			
Date _	09/25/2020			
County	y Corson Pond I	D or Legal Des	cription <u>Hold</u>	ling Pond 4
•	<b>Method Selected for Land Application of</b>	Wastewater		
	X Pipeline/Sprinkler System (I		aste Storage Poi	nd 2
	Big Gun Sprinkler (Tempo	•		
	Drag Hose System			
	Tank Wagon: Waste Storage	Pond 1		
	Other (Explain)			
•	<b>Pre-Arranged Source of Application Equ</b>	ipment (List a	ll necessary equ	ipment and
	access to it).			
	<u>Type Equip.</u>	<u>Obtai</u>	<u>n Where</u>	
	Pump	Floating Pu	ımp on Pond 4	
	Pipe	To Existing	Pivot on Field 3	, 12B, 47B
	Center Pivot			
	Center Pivot		Field 12B & 471	3
•	Fields Available for Land Application of	Wastewater in	an Emergency	
	<b>Legal Description</b>	<b>Landuse</b>	Acres	<u>Available</u>
<b>Predor</b>	n. Soil			
SW 1/	/4, Section 4, T 21 N, R 27 E Grass & Cr	opland	103.0	ShB
N 1/2, 3	Section 9, T 21 N, R 27 E Grass & Crop	land 12	0.0	ShB
•	<b>Holding Capacity of Ponds at Maximum</b>	<b>Operating Lev</b>	rel 11,218,5	11 gallons
	Bottom of 25-year, 24-hour storage	level. Pond is to	o be pumped with	hin 10 days
	below level.			•
•	Holding Capacity of Ponds at High Water I	Line <b>22,7</b>	63,595	gallons
	Top of 25-year, 24-hour storage level (botto	om of freeboard	<i>(</i> ).	
•	<b>Holding Capacity of Ponds between Free</b>	board and Ma	ximum Operati	ng Elevation
	<u>11,545,084</u> gallons			
	Bottom of freeboard- Maximum Ope	erating Elevatio	n.	
	A. P. C. D. A.			

• Application Rates

The fertilizer value of wastewater in Holding Ponds is variable. Prior to land application, it is recommended to collect a representative sample from the pond and sent to a testing laboratory for analysis. If time does not permit waiting for test results, estimates of the nutrient content can be made from data previously collected.

The land application rate should be calculated based on (1) the nutrient content of the wastewater, (2) current soil tests, (3) crop needs and (4) the water intake capacity (inches/hour) of the soil if an irrigation system is used.

For more information and/or assistance in calculating application rates, refer to SD-CPA-63.

Section N: Record Keeping Guidelines

# Recordkeeping

Keeping records plays a critical role in a manure management system. Records are essential to determine appropriate rates of manure to apply to the land while protecting surface and groundwater resources. It enables operators to make good annual and long-term decisions concerning efficient use of manure. Additionally, records serve to document compliance with regulations or voluntary adoption of best management practices.

Records should be maintained for five years or as otherwise instructed by specific federal and state laws, local county ordinances and/or program requirements.

At a minimum, track manure applications by collecting and keeping records of the following information:

- Soil test results and recommendations for all fields receiving manure (sampled and tested prior to hauling manure).
- Manure test results.
- Identity of the fields hauled to (including acres spread on and where in the field).
- Calculated "planned" manure application rate per field.
- Calculated "actual" manure application rate per field.
- Method of manure application.
- Date(s) and time(s) of manure application.

The following additional records are recommended if the goal is to implement a whole farm nutrient budget program:

- Soil test results and recommendations for the remaining fields receiving nutrients from other sources (i.e. commercial fertilizer).
- Form/rates of other nutrient sources applied per field.
- Crop planting and harvest dates and yields per field.

Soil testing ou a whole farm basis provides fertility level information on all fields allowing operators to make decisions as to where manure nutrients can best be utilized.

The Manure Nitrogen and Phosphorus Application Worksheets provided with this plan serve as excellent recordkeeping tools to document test results and manure applications.

Section O: Manure Application Planning

Return to Main Menu

# South Dakota

# N & P Manure Application Determination

the current level of phosphorus in the soil, (2) the potential soil loss, and (3) the presence or absence of a 100 foot vegetated buffer Three factors are considered when recommending a nitrogen-based or phosphorus-based manure application. They include (1) in fields having certain soil phosphorus test levels. See table below.

		Nitrogen need/Pho	Nitrogen need/Phosphorus Crop Removal Manure Application Determination	Manure Application D	etermination	
Soil Test	Soil Test Phosphorus		Predicted Soil Loss - Sheet and Rill Erosion (tons per acre per vear)	וeet and Rill Erosion (t	ons per acre per year)1	
)	(maa)	Less	ess than 4	4 tc	4 to 6	Greater than 6
	,					
		Min. 100 Foot \	Min. 100 Foot Vegetated Buffer <sup>2</sup>	Min. 100 Foot Vegetated Buffer <sup>2</sup>	egetated Buffer <sup>2</sup>	
Olsen	Bray-1	Yes	No	Yes	No	
0-25	0-35	Nitrogen Need	Nitrogen Need	Nitrogen Need	Nitrogen Need	No application
					Phosphorus crop	
26-50	36-75	Nitrogen Need	Nitrogen Need	Nitrogen Need	removal <sup>3</sup>	No application
			Phosphorus crop	Phosphorus crop	Phosphorus crop	
51-75	76-110	Nitrogen Need	removal	removal		No application
		Phosphorus crop	Phosphorus crop	Phosphorus crop	Phosphorus crop	
76-100	111-150	removal	removal	removal		No application
Greater	Greater than					Topoldo or
than 100	150	No application	No application	No application	No application	No application
, , ,						المراجعة الم

Refers to a calculated soil loss estimate using the Revised Universal Soil Loss Equation (RUSLE)

application for the entire crop rotation or multiple years in the crop sequence. When such applications are made, however, the Note: A single application of phosphorus applied as manure may be made at a rate equal to the recommended phosphorus application rate should not exceed the recommended nitrogen application rate for the planned crop.

Refers to the vegetated area width between manure or wastewater land application and a natural/manmade drainage, tile inlet or other conduit.  $^3$  Crop removal is the amount of phosphorus a planned crop removes in one crop year.



# Recommended Soil Sampling Methods for South Dakota

Photo courtesy of USDA-NRCS

R. Gelderman, manager, SDSU Soil Testing Laboratory J. Gerwing, SDSU Extension soils specialist K. Reitsma, South Dakota Department of Agriculture

Soil testing is your best way to evaluate the fertility status of a field or of areas within a field. When you send a sample off to the laboratory for plant-available nutrient analysis, a good soil sample that adequately represents your field or area gives you good results. A poor sample will only lead to an analysis of limited value and be a waste of your time and money.

The volume of the soil sample you will send in shrinks at each step from field to laboratory (Fig 1). Thus, it is imperative to start with a representative sample from the field. Depth of sampling, timing of sampling, equipment, sample handling, and sampling procedures all have an effect on a good representative soil sample.

### When and how often to sample?

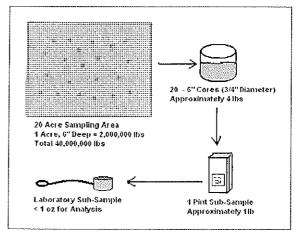
About 70% of soil sampling in South Dakota fields is done in the fall with the remainder done in winter and early spring. Phosphorus (P), potassium (K), pH, soluble salt content, and micro- and most secondary nutrient soil tests are not affected by sampling time; therefore, soil samples for these tests can be taken any time during the year.

Soil biological activity affects nitrogen ( $NO_3^--N$ ) and sulfur ( $SO_4^{-2-}$ ) soil test levels. Therefore, if you sample in the fall, it is recommended to wait until after soil

temperatures are below 50° F. Above this temperature, nitrogen and sulfur are released from organic matter and crop residue; and below this temperature, nutrient releases normally become negligible.

Warmer than normal winters with an early spring sometimes lead to higher NO<sub>3</sub><sup>-</sup>-N levels in spring compared to fall, particularly after a soybean crop. Sampling small grain stubble with excessive regrowth can

Fig 1. Relative sample size to sampling area.



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lead to lower soil test NO<sub>3</sub>"-N levels because of nitrogen uptake by the regrowth. Winter sampling is dependent on the amount of snow cover, an issue in some years.

Whatever season you choose, sampling fields at approximately the same time each year will lead to more consistent results when comparing soil tests from year to year.

In general, soil tests for P, K, pH, soluble salts, calcium (Ca), magnesium (Mg), and micronutrients will change very little from year to year and need to be analyzed only every 2 to 3 years. In contrast, levels of NO<sub>3</sub><sup>-</sup>-N can change dramatically from year to year and should be analyzed every year prior to planting non-legume crops.

However, many producers and crop advisors prefer to test each nutrient every season to quickly develop a nutrient history for each field or area sampled. An erratic analysis due to sampling or laboratory error can easily be found by using this approach.

In summary, a soil sample for most soil tests can be taken anytime during the year. For most mobile nutrients, in particular  $NO_3^-$ -N, samples should be taken in late fall (when soil temperatures are below 50° F), in winter, or in early spring.

### Is sample depth important?

Many plant nutrients are concentrated near the soil surface and decrease with depth. Depth of sampling should be consistent between fields and over years to obtain comparable nutrient values.

Most soil tests were originally related to crop response using a specific soil sampling depth. It is important to keep using this sampling depth to obtain proper plant nutrient recommendations. Depth of sampling will depend on nutrient sampled, crop, and perhaps tillage.

### Nutrients

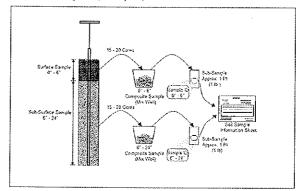
A 0-6 inch sample is recommended for P, K, pH, organic matter, soluble salts, zinc (Zn), iron (Fe), manganese (Mn), copper (Cu), and boron (B). A deep sample (24-inch) is recommended for mobile nutrients such as NO<sub>3</sub><sup>-</sup>-N, chloride (Cl), and sulfur ( $SO_4^{2^-}$ -S). It is recommended to separate deep samples (0-24 inch) into two separate samples; one representing the 0-6 inch depth and the other a 6-24 inch depth (Fig 2).

If an even deeper (0-48 inch) sample is desired or required to determine deep NO<sub>3</sub><sup>-</sup>-N, separate this sample into 0-6, 6-24, and 24-48 inch depths.

### Crop

A deep sample (6-24 inch along with the 0-6 inch depth) should be taken for all proposed non-legume crops and some legumes such as edible beans that have been shown to respond to additional nitrogen. For other pro-

Fig 2. Dividing samples by depth increment.



posed legume crops and permanent grass, a 0-6 inch depth is sufficient. However, cropping plans often change and a deep sample may be advised for these situations as well.

A deep sample must be taken if the field is part of a Concentrated Animal Feeding Operation (CAFO) manure plan.

### Tillage

With limited tillage, nutrients can become stratified or concentrated near the soil surface to a greater degree than with tillage. Soil pH can be lower at the soil surface with less tillage and increase with depth. If these conditions appear to be a problem for plant growth, it is recommended that samples be taken at 0-2, 2-4, and 4-6 inch depths to determine any pH or nutrient stratification.

If possible, it is recommended to soil sample before any tillage is completed. It is difficult to maintain the correct sample depth (especially of the surface soil) after tillage is done and surface conditions are very soft. Sampling the surface (0-6 inches) by hand may be the only option in such cases because of compaction of the loose surface soil in the sampling tube.

### Sampling "holes"

Samples for multiple depth increments can be taken from a single core if equipment allows. Taking continuous cores is preferred but if equipment does not allow this; a surface sample may be taken, removed, and the sampling equipment placed in the same "hole" to obtain a deeper depth. Be sure to remove any topsoil contamination from subsequent cores when using the same hole. This procedure can be repeated until the desired depth is sampled.

### Special sampling situations

Banding fertilizer with no-till, strip-till, ridge till, or seeding operations with little tillage can cause very high nutrient levels within these band areas. This can lead to

high levels of soil test variability from year to year in these fields. Research from Colorado State University suggests the following sampling procedure for these fields when the location of the band is known:

S = 8(BS)/12

Where:

S = Cores taken between bands

BS = Band spacing (inches)

The number of cores taken between the bands is related to the fertilizer band width. For example, if band spacing is 30 inches, 20 cores should be taken between the bands to be mixed with one core taken from within the band area. The mixture will be the composite sample for the area sampled and should provide a reasonable average for the sampling area.

An alternative is to sample only the area outside of the fertilizer band(s). This will provide a representation of soil test levels of non-banded soil areas.

If the location of the band is unknown, it is recommended to sample the area randomly or use a paired sample method. Paired sampling is used with a random sample pattern, taking an initial core and then a second core half the distance of the band spacing and perpendicular to the direction of the band. For example, if band spacing is 30 inches, randomly select a location for sampling; take the core; measure 15 inches in the direction perpendicular to the band; take a second core. Continue sampling in this manner until 15 to 20 locations have been sampled. A composite of these cores is then subsampled and submitted for analysis.

## Sampling equipment

The right tools can make sampling easier and provide better cores and a better sample. Consider the sampling operation step by step and the tools you will need to take the sample, hold and mix the composite sample, contain the subsample, and record information about the sample.

Having alternate equipment to anticipate varied soils and sampling conditions can also help with sampling.

# Sampling probe

A sample (core) probe is the best tool for taking a soil sample. These may be hand or hydraulic probes. Hydraulic probes can be truck (in-cab, side, or rear mount), or ATV or tractor mount. In-cab mount probes have become popular, as samples can be taken without leaving the cab of the pickup (Fig 3). ATV mounted probes can sometimes be used to sample under more adverse field conditions and will do minimal crop damage.

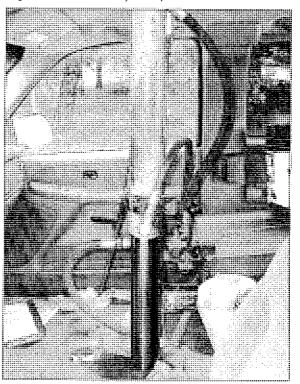
## Sampling equipment considerations.

- Extra probe and tips
- Field information (i.e. maps, aerial photos, soils information)
- · Sampling tool(s) to clean probe
- Tape measure or ruler
- Knife or sample divider
- Lubricant (i.e. WD-40)
- · Clean plastic containers (at least 1 1/2 gallon)
- Sample bags/boxes
- · Box or container to hold sample bags/boxes
- · Permanent marker and/or pencil

Many types of probes are available, each with different characteristics and price ranges. Regardless of what type is used, a probe should provide a uniform soil core to the depth of insertion without compacting inside the probe. In practice this depends on many factors, including tillage practice, soil texture, soil moisture, and lubrication and characteristics of the probe.

Some probes work better in some situations than others. Experience is the best teacher. Always ask the vendor for references in your area to obtain their experiences with the product or equipment.

Fig 3. In-cab truck mount hydraulic probe.



## Lubricants

Lubricants can be helpful in some soil conditions by preventing soil from plugging in the tube, especially when soils are wet. Water repellent petroleum-based lubricants such as WD-40<sup>TM</sup> can be used. In research studies this lubricant did not influence most soil tests.

Avoid or limit use of lubricants for samples where testing for soil carbon (organic matter) or micronutrients. Cooking sprays or crop oils may influence NO<sub>3</sub><sup>-</sup>-N mineralization on some soils, affecting analysis.

It is best to take the sample without a lubricant if possible. However, use one if necessary to get a good sample.

## Other tools

Containers that can hold the cores from which you will make a composite sample are recommended to be made of plastic and hold a volume of 1 1/2 gallons or more. This allows for additional room for mixing and a reduced chance of sample contamination. Mark each container with a permanent marker to indicate depth intervals.

Avoid using containers that previously held materials such as hydraulic fluid, motor oil, fertilizer, feed, or other materials that may contain residues. Tools or containers that are galvanized or rusted should be avoided, as these could influence micronutrient analysis.

## Sample handling and shipping

Soil NO<sub>3</sub><sup>-</sup>-N levels can increase substantially if samples are left moist and warm. Samples intended for NO<sub>3</sub><sup>-</sup>-N analysis should be air dried or frozen within 12 hours of collection. If possible, keep these samples cool while in the field. To dry, spread the sample out on clean paper in a dust-free heated room. Samples will usually air dry within 6 to 12 hours by directing a household fan on them. If frozen, pack the frozen samples into a shipping container. During cooler weather the samples should be fine if arriving at the laboratory within 2 days.

Use latex/rubber gloves to mix and handle samples for chloride analysis to limit chloride contamination from perspiration.

For some high clay content soils or soils that are very moist, the cores will not break up easily to obtain a mixed, composite, pint sample. In these cases it may be necessary to take the entire sample out of the field for drying and/or grinding so an adequate subsample can be obtained.

Mail soil sample information under separate cover or, if mailing in the soil shipping container, seal the information in a plastic bag, especially if the samples are frozen or moist.

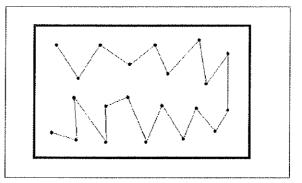
## Field sampling methods

Fields may be divided into smaller parcels or "zones" or sampled as a whole field. The strategy used to sample a field will often dictate the number of samples submitted for analysis.

## Whole field composite method

Traditionally this is the method that many consultants, dealers, and producers in South Dakota follow to obtain a soil sample. The procedure consists of taking at least 15 random cores from the field and compositing (mixing) by depth increment (Fig 4). The advantage of this system is that it is quick, relatively inexpensive, and fairly reproducible.

Fig 4. Random, whole field composite sampling.



With this method it is advised to avoid unusual areas or sample these areas separately. Identifying these outlier areas is sometimes difficult. The whole field method also does not determine what nutrient variability exists in the field.

If substantial nutrient variability does exist, use of the whole field composite method can result in over- or under-fertilization on large areas of the field. This can be expensive, either from costs from applying unneeded nutrients or from yield loss due to under-fertilization.

Other field soil sampling methods do a better job of measuring the nutrient variability within a field, and they provide a better picture of available plant nutrients. The following is a brief summary of methods currently recommended in South Dakota.

## Sampling for within-field variability

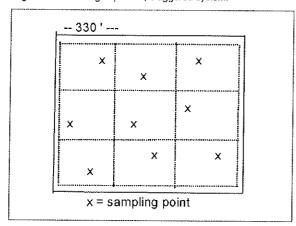
The goal for within-field sampling is to determine the nutrient, salt, or pH variability within a field. Once this is determined, the nutrients are mapped and fertilizer and/or lime is variably applied.

## Grid sampling

The field is divided into rectangular grids and a sample is taken from each grid. Each grid sample is usually a composite of 6 to 8 cores.

In some procedures the cores may be taken in a "point," usually from a circle of 6 to 8 feet around the point located in the grid of interest. If this system is used the points should be staggered in the grid as one goes from one grid to the next (Fig 5). Because of past management practices "streaks" of higher nutrient concentrations can often be found from one end of the field to the other. Staggering the point samples can avoid bias in the soil tests.

Fig 5. A 2 1/2-acre grid pattern, staggered system.



A number of studies have determined that the largest grid size that will adequately measure nutrient variability for a field should be no more than 2.5 acres in size. In fact, many studies have shown the size should be less than one acre. This is cost prohibitive in most situations, and many workers have found that the nutrient variability within a grid may be as high as that within the whole field.

Consider using a grid system where the field history is unknown, the non-mobile nutrients (P, K, Zn) are of primary importance and are high either from past fertilization or manure applications, where small fields have been merged into one or more large fields, or where year to year variability in non-mobile nutrient tests are high.

## Directed sampling

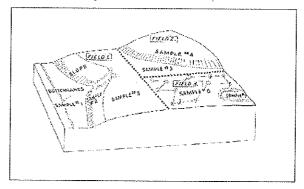
A more direct approach to sampling can be done by assuming there is a logical reason to nutrient variability in the field. Directed sampling is also called "zone sampling," "management zone sampling," or "smart sampling."

Detailed information about a field, such as yield monitor maps, remote sensing imagery, digital soil survey or topographic maps, and/or electrical conductivity data, can all help define nutrient management zones.

## Sampling by landscape/topography

One of the oldest procedures used to divide fields into variable nutrient zones is sampling by visual land-scape differences (Fig 6). Perhaps uplands are one sample, slopes another, and low ground another.

Fig 6. Soil sampling method based on landscape.



Logically this make sense in that you would expect the sloped, eroded areas would have less nutrients than the low ground where soil and nutrients tend to accumulate. The higher (less sloping) landscape areas usually would be in between.

Sampling zones by landscape can be done visually, with aerial or satellite photos, or by using elevational data from GPS units. A study in North Dakota on a 40-acre field required only four to seven samples (zones), compared to 36 for a grid sampling approach. A field with four landscape zones would have four separate samples, each with a minimum of 15 cores.

## Other methods of directed sampling

There are other logical reasons to use directed soil sampling. One of the most common forms of directed sampling is to use yield zones within the field. Reasons to use this method include: 1) soil areas with high yields may lead to lower soil nutrient levels, because more nutrients were removed as more grain was produced, and 2) areas with lower yields may be limited by nutrients.

In other cases, yield variability is not because of nutrient limitations but due to other growth factors such as soils, water limitations, drainage, etc.

Other directed sampling methods include using aerial or satellite imagery that shows soil color differences or crop growth patterns or color.

Measuring soil conductivity with an on-the-go sensor also may help define management or sampling zones. If the measured conductivity relates to plant nutrient levels, then such a system is useful. Knowledge of the field and other layers of information can also be useful when establishing management zones.

Recent or older field maps such as from the Farm Service Agency (FSA) will provide a reasonable aerial photograph of the field. County soil surveys provide aerial photographs with soil phase mapping units imposed over an aerial photograph. These maps can be useful for deciding if the field should be divided into sampling zones. Older aerial photographs may be useful in identifying areas to avoid such as old farm yards, fencelines, or other

features that may no longer exist but can influence a soil test.

Combinations of the various directed sampling methods listed above are also sometimes used. For example, combining yield zones, conductivity areas, and landscapes with a computer program or "black box" approach could be used in designing management zones. Whatever the approach, check the system with ground truth information. Use of a program alone is no substitute for field knowledge.

It is important to remember how these different sampling methods fit with your fertilization program. In the whole field approach, it is assumed that the whole field is somewhat uniform and the field is fertilized the same. With the grid sampling method, the analysis from each grid is used to create a variable map (using various statistical techniques) to determine the amount of fertilizer to use. With directed soil sampling, some identification (i.e., yields, landscapes, aerial photos or some combination) is

used to make the management zone maps. These areas are then sampled, analyzed, mapped, and fertilized according to area soil test results.

With any of these sampling methods—whole field composite, grid, or directed—locating the core point with GPS may lead to more consistent results when resampling these fields or areas.

## Review

Any good soil fertility program begins with a good soil test, which begins with a good soil sample. For any field sampling method, the basics of good sampling remain the same and should be followed. For many producers a whole field randomized composite sampling method is a good first step. However, for those wishing to obtain more knowledge about nutrient variability within a field and to possibly increase productivity, a more intensive sampling program should be used.

## For more information, contact:

Soil Testing Laboratory Box 2207A South Dakota State University Brookings, SD 57007-1096 Telephone: (605) 688-4766

Fax: (605) 688-4667

Web: http://plantsci.sdstate.edu/soiltest/Index.html

E-Mail: SDSU\_Soillab@sdstate.edu

South Dakota State University Cooperative Extension Service Box 2207A Brookings SD 57007 Telephone: (605) 688-4772

FAX; (605) 688-4667

Web: http://sdces.sdstate.edu/index.cfm

Available online: http://agbiopubs.sdstate.edu/articles/FS935

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MANURE AS A RESOURCE SERBIS

# For information or assistance with management options, contact your local:

- Conservation District,
   Cooperative Extension Service or
- Natural Resources Conservation Service.

and Biosystems Engineering Box 2120, SDSU Department of Plant Science Department of Agricultural South Dakota Association, South Dakota Cooperative charles\_ullery@sdstate.edu Extension Service/South Dakota State University Brookings, SD 57007 Box 2207A, SDSU Brookings, SD 57007 Fax;1605) 688-5764 200 Fourth Street SW Huron, SD: 57501 of Conservation Districts USDA Natural Resources www.sdconservation.org info@sdconservation.org Pierre, SD 57501-0275 Conservation Service Fax: (605) 895-9424 Federal Building (605) 352-1200

Foss Building, 523 E. Capitol, Pierre, SD, 57501 (800) 228-5254 - (605) 773-3375 - Fax. (605) 773-4003 South Dakota Department of Agriculture Office of the Secretary www.state.sd.us/doa

iames, gerwing@sdstate.edu

outlicaffairs@sciusda.gov

MYN.Sd.nrcs.usda.gov

Fax: 605-352-1270

Fax. (505) 688-4667

For information or assistance with regulatory requirements: 800) GET-DEMR -(605) 773-3351 -Fax: (605) 773-5286 South Dakota Department of Environment and Foss Building, 523 E., Capitol Avenue Pierre, SD 57501-3182 Surface Water Quality Program VaturalResources

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a nondiscriminatory basis.

SD-NRCS-FS-36 · Nov. 2002

# Manure for **Autrient**

Photo courtesy USD4 NRG5 SD

# Sampling Wanure for Nutrient Management

Autrients needed for crop production can be supplied by manure, commerical fertilizer, or a combination of the two.

Regardless of the source, nutrients must be production needs and prevent surface and applied in the right amount to meet erop ground water pollution.

amount of commercial fertilizer needed to manure applied, producers can adjust the By knowing the nutrient content of the meet crop requirements.

Producers have two options for determining

the nutrient content of manure produced on their farm:

1. Estimate using published values (see table below) or

samples tested over a period of several years. An analysis estimates the nutrients in manure 2. Use the results of a laboratory analysis. from a specific operation. Nutrient values listed in publications are averages from

most accurate of the two methods. All permited facilities are required to use a lab analysis. A laboratory analysis is the preferred and

of Selected Types of Manure'

Estimated Nutrient Content	ypc, Nitrogen Content	Solid Manure (Las/ton)	Beef or Dairy Caldle 5
The nutrient content of	manure varies with the type,	ege, and weight of divestors feed program; and manure	handling system.

Liquid Manure (Lb/1,000 gallons) nutrients provides the information needed to develop a be tested for total nitrogen, phosphorus and total potassium, An analysis for these nutrient management plan. inorganic nitrogen, total

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Broilers or Turkeys

test results, refer to "Using Results from a Manure Analysis" (SD-NRCS-FS-38), For information about land application, refer to information about how to interpret manure This publication describes how to collect, handle, and ship manure samples. For

available online at SD DENR's website, Visit; "Calibrating Manure Spreader Application Rates" (SD-NRCS-FS-43). Brochures are http://www.state.sd.us/denr/DFTA/ WatershedProtection/WQInfo.htm.

# Tok to wanted

on the quality of the manure sample received. A important, however, to allow the laboratory time time of land application as possible provides the The accuracy of a laboratory analysis depends best information about its fertilizer value. It is solid manure sample collected as close to the

must be agitated before sampling and is usually

land applied after the sample is taken. Therefore, it is suggested that producers handling

to complete the analysis and return the results.

liquid manure use the average of several years

of nutrient test results to estimate the nutrient commonly found in liquid manure. Usually three weeks is sufficient. Liquid manure

level in the manure. When information from past years is not available, cooperative extension and publications that list the estimated nutrient levels conservation district professionals can provide

# SOLID MANURE Sampling

47



Photo countery USDA NRUS

# accurate lab analysis of solid manure hinges on collecting a representative sample.

- lcakage. Collect manure from at least 10 different locations in the barnyard or feedlot. The locations selected should be similar in moisture, feed, hay and bedding content. Avoid areas near waterers, drains, and feedbunks where materials other than manure often accumulate. If sampling stockpiled manure, collect manure from several deptins. Avoid the exposed outer layer of the pile.
- Dump the manure collected on a hard, flat surface. Use a shovel or pitchfork to mix the manure until the pile looks uniform  $\sim$ i
- Take several small samples from the mixture until about a gallon has been collected ~
- Place the mixture in a heavy weight plastic freezer bag. Squeeze the bag to remove the air. Place the bag in a second freezer bag to prevent
- ready to ship. See information at right for sample Freeze or store the sumple in a cool place until identification and shipping instructions. ς,

# SAMPLE IDENTIFICATION AND SHIPPING

- Attach a label to the bag or bottle of manure.
- Name
- Mailing address
- Telephone number
- · Sample site (feedlot, pit, pond)
- Type of manure (beef, dairy, swine, chicken, turkey)
  - Date the sample was collected,
- Complete a laboratory information sheet, If possible, use an information sheet from the lab that will complete the test. Visit the county Cooperative Extension or conservation district office for assistance in obtaining forms,\* C.1
- Place the frozen or refrigerated sample and laboratory information sheet in a styrofoam or similar insulated container. Add cold packs and packing materials to protect the sample during shipment. 3
- that it arrives at the lab by Thursday. Samples Deliver the sample to the lab or ship by overnight mail or courier. If using regular mail, ship the sample early in the week so that arrive on the weekend may warm up and start to decompose. The nitrogen test for these samples will be inaccurate. त्तं

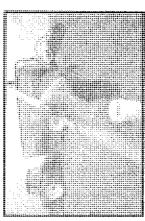
Ship samples to:

Olson Biochemistry Labs, ASC 133 South Dakota State University

Brookings, SD 57007-1217 Phone: (605) 688-6171 Fax: (605) 688-5295 \*A form for submitting manure samples to the lab at SDSU is available online. Visit: h<u>ito:ilanserv.sdstate.edu/</u>and click on "Submission Form" to

download the file. Fees are listed

# LIQUID MANURE SAMPLING



courtes; USDA NRCS SD Chesto

Sampling from a loading pipe or tank spreader is the preferred method of collecting a liquid manure sample.

- oughly before loading the tank spreader. If this Agitate the manure in the storage facility thorstep is omitted, the sample will not accurately estimate the nutrient value of the manure in the storage pit.
- Collect one quart samples from at least five different tank spreader loads using a clean plastic container ςį
- Pour the samples into a clean, large plastic pail. ó
- Thoroughly stir the contents of the pail. Use a long handled dipper to transfer several cups of 4

bottle until the liquid is about two inches from the top of the bottle. DO NOT FILL TO THE the swirling mixture to a clean, one quart plastic TÓP!

- Place the bottle in a heavy weight rescalable plastic freezer bag to prevent leakage. vi
- Freeze or store the sample in a cool place until ready to ship. See information at right for sample identification and shipping instructions. 6

# LIVESTOCK MANURE SAMPLE SUBMISSION FORM

Analytical Services, Olson Biochemistry Labs, ASC 133 South Dakota State University, Box 2170, Brookings, SD 57007-1217 Phone: 605-688-6172 FAX: 605-688-6295

Web address: http://anserv.sdstate.edu

Use one sheet for each sample.	
Bill:	Сору:
Name:	Name:
Address:	Address:
City, State, Zip:	
Phone: FAX:	Phone:FAX:
Email:	
Sample Identification	
Sample Information (check <b>only one</b> of each Species:BeefDairySwine	group)
Report as:lb/ton (solid)lb/1000 g	
Storage System/Solid: Daily scrape. Manure	e pack,Open lot,Deep pit(poultry),Litter(poultry),Manure stacking. ve ground tank,Earthen storage (pond),Lagoon
Payment Enclosed: \$ All fees subject Charges for out of state residents are 1.5 time Make Checks Payable to: Olson Biochemistry	s those listed below
For information on collecting samples refer to (11/2002) available from your local Conservati	SD-NRSC-FS-36, "Sampling Manure for Nutrient Management" on District /NRCS or Cooperative Extension Service office.
\$10.00 Sample handling and preparation\$40.00 N, P, K and NH₄-N (required for D\$28.00 N, P, K analysis.	
\$19.00 P and K analysis.	
individual Tests \$ 9.00 Total nitrogen (N) \$15.00 Nitrate-nitrogen (NO <sub>3</sub> -N) \$12.00 Ammonium Nitrogen (NH <sub>4</sub> -N) \$24.00 Urea-nitrogen, includes Ammonium \$12.00 Selenium (Se)	\$14.50 Sulfur (S)\$ 4.50 Moisture\$ 4.00 Density N\$ 5.00 pH
Phosphorus (P) Ir Potassium (K) Z	\$14.50 and \$4.50 for each additional element.  fon (Fe)Cobalt (Co) inc (Zn)Magnesium (Mg) calcium (Ca)Manganese (Mn
Check desired element(s). First element isArsenic (As)Lead (Pb)	\$27.00 and \$14.50 for each additional element. Cadmium (Cd) Molybdenum (Mo)
lement profile by ICP. Inquire.	
ote: All elements are "total" unless otherwise i	ndicated. P is reported as P₂O₅ and K is reported as K₂0.

Using Manure Analysis Results

# For information or assistance with management options,

# confact your local;

- · Conservation District, · Cooperative Extension Service, or
- · Natural Resources Conservation Service.

South Dakota Association South Dakota Cooperative of Conservation Districts Extension Service/South Dakota State University

Pierre, SD 57501-0275 Fax: (605) 895-9424 (800) 729-4099

Department of Agricultural Engineering Box 2120, SDSU Brookings, SD 57007 (605) 688-5144 and Biosystems info@sdconservation.org www.sdconservation.org

charles ullery@sdstate.edu Fax: (605) 688-6764 SDA Natural Resources Conservation Service 200 Fourth Street SW Fax: 605-352-1270 Huron, SD 57501 Federal Building (605) 352-1200

Department of Plant Science ames genwing@sdstate.edu Brookings, SD 57007 (605) 688-4772 Fax: (605) 688-4667 Box 2207A, SDSU oublicaffairs@sd.usda.gov www.sd.nrcs.usda.gov

South Dakota Department of Agriculture Office of the Secretary

Foss Building, 523 E, Capitol, Pierre, SD 57501 (800) 228-5254 - (605) 773-3375 - Fax: (605) 773-4003 www.state.sd.us/doa

# For information or assistance with regulatory requirements:

South Dakota Department of Environment and

Vatural Resources

Surface Water Quality Program

Foss Building, 523 E., Capitol Avenue Pierre, SD 57501-3182

Phosphate (P.0.) equivalent, Ibiton Potash (K.0) equivalent, Ibiton

Reviewed By:

nic Nitrogen, Ibilion

(800) GET-DENR -(605) 773-3351 · Fax: (605) 773-5286 www.state.sd.us/denr/DES/surfacewater/feedlot.htm

by Section 319 NPS and Pollution Prevention Incentives to This publication is part of a cooperative educational Printing of this publication was made possible States Grants from the U.S. EPA - Region VIII. project by the above entities.

SD-NRCS-FS-38 · March 2003 a nondiscriminatory basis.

Programs and services are available to everyone on

# Livestock manure is a valuable resource. When applied to cropland, manure:

provides nutrients for crop production,

· improves soil structure and water

holding capacity, and

fertilizer needed to reach yield goals.

· reduces the amount of commercial

To fully realize the fertilizer value of manure and protect the environment, a nutrient manthat will receive manure. The plan is a plant agement plan is recommended for each field prevents nutrient buildup and helps prevent food budget for the field. Balancing the nutrients added with uptake by the crop surface and ground water pollution,

# Nutrient management plans include:

- plant nutrients needed to reach the goals, · yield goals for the crops to be grown,
  - · soil test results for each field,

100% 004 Matter Basis

As Received Basis

John or Jane Doe 12345 678th Ave. Rural, SD 57XXX

SOLID MANURE Total Moisture, percent Total Dry Matter, percent

005-0001

Reported: 7/22/02 Received: 7/14/02

Report of Analysis

- an estimate, based on a lab analysis, of the nutrients that will be supplied by manure
- eredits for nutrients supplied from other sources such as legumes,
  - required to meet the remaining crop the amount of commercial fertilizer production needs, and

Total Nitrogen, lbiton Nirale-Nitrogen, Inlon

hasphorus, percent

Vigate Narogen, percen Total Nitrogen, percent

identification of areas where manure should not be applied. For information about sampling manure and calibrating application equipment see:

NRCS-FS-43). Brochures are available on SD ment" (SD-NRCS-FS-36) and "Calibrating Manure Spreader Application Rates" (SD. "Sampling Manure for Nutrient Manage-DENR's website. Visit:

http://www.state.sd.us/denr/DFTA/ WatershedProtection/WOInfo.htm

# available from manure is influenced by how: An accurate estimate of the nutrients

- the manure sample was collected. prepared, and shipped; and
  - the manure will be applied.

manure. Making either mistake can be costly: in the manure, Improperly calibrated equipaccurate estimate of the nutrients contained Poorly handled samples do not provide an ment will result in over or under applying

- expected nutrients from manure may be insufficient to reach yield goals,
- · more, or less, commercial fertilizer than needed could be applied, and
- nutrient build up in the soil may affect future manure applications to the field.

ment plan are available at Cooperative Extension Service, Natural Resources Conservation Worksheets for preparing a nutrient manage-Service, and conservation district offices, or by visiting:

Surfaccwater/ManureMgt/Tools.htm http://www.state.sd.us/denr/DES/

# nutrient avallability

The nitrogen, phosphorus and potassium in manure are present in two forms:

by a process called mineralization. The rate of pounds are available for use by plants the year decay process, bacteria and fungi convert the moisture, soil chemistry and time. Therefore, Nutrients become available for plant growth when organic compounds decay. During the organic compounds to inorganic compounds not all of the nutrients in the organic commineralization is affected by temperature, organic compounds and · inorganic compounds. manure is applied.

Mineralization occurs most rapidly in warm, moist, neutral to slightly alkaline soils. For South Dakota, a common rule of thumb for nitrogen mineralization is: About one-third of the organic nitrogen becomes available each year for three years following a manure application.

available for erop production during the year the The South Dakota Experiment Station found the following amounts of the nutrients are usually manure is applied:

- Inorganic Nitrogen 100 percent
  - 35 регсепt Organic Nitrogen
- 80 percent Phosphorus
  - 00 percent Potassium



- Fertilizer recommendations are based on the: · moganic (N) nitrogen and
- phosphorus (P<sub>2</sub>O<sub>5</sub>) and potash (K<sub>2</sub>O) oxide equivalents

If the analysis report does not provide phosphorus and potash equivalents, the values can be Each formula is accompanied by an example determined using the formulas shown below. using numbers from the sample lab report shown on the cover:

lbs. P<sub>2</sub>O<sub>5</sub> = Lbs. Phosphorus x 2.29  $22.4 = 9.76 \times 2.29$ 

lbs. K<sub>2</sub>O ≈ Lbs. Potassium x 1.20 26.4 = 22.0 x 1.20

# CALCULATING THE NUTRIENT

The fertilizer value of manure is calculated using Using the report shown on the brochure cover as value of manure as fertilizer information provided by the laboratory report. an example, the fertilizer value is:

# Fertilizer Values (lbs./ton)

7.7	9.3	17.0	17.9	26.4
Inorganic Nitrogen	+ Organic Nitrogen (26.6 x 0.35)	Total Nitrogen	P <sub>2</sub> O <sub>5</sub> equivalent (22.4 x 0.80)	Potash (K,O) equivalent
Nitrogen:			Phosphorus:	Potassium:

available for crop production during the year the manure was applied. It does not account for nutrients lost during application. The nutrients from manure applied during the

previous two years must also be considered in a

nutrient management plan (see Nutrient Avail-

ability section).

The example shows only the estimated nutrients

The method used to apply manure and the length kniffing application. After four days, the nitrogen reduces the nutrients available for plant growth. decrease by as much as 30 – 40 percent through irrigation systems is commonly lost to the atmonitrogen loss with same day incorporation or a of time between application and incorporation content of manure left on the soil surface may content of manure applied through sprinkler volatilization. Thirty percent of the nitrogen Producers can expect a one to five percent

potential for phosphorus to pollute streams and Delays in incorporating manure increase the lakes if run off occurs.

To reduce nutrient losses and prevent pollution:

- incorporate surface applied manure within 24 do not spread manure on frozen or snow hours, and
  - covered ground.

# USING THE ANALYSIS REPORT

content of the manure sample submitted. The Most laboratory reports provide information of manure submitted, the analysis requested, format of the report may vary with the type about the moisture, dry matter and nutrient and the laboratory completing the analysis. The test results are usually reported:

- · as a percent by weight per ton or 1,000 gallons, or
  - on both an "As Received" and "Dry Matter" basis.

The cover of this publication shows a report format used by many laboratories.

"As Received" values are not provided by the lab, Manure is normally applied in the form it was sampled. Therefore, the "As Received" results must be used to plan a manure application. If

"Dry Matter" values can be converted to "As Received" using the following formula:

Matter" to "As Received" "NN X MON X " DM

Formula for the Conversion Of "Dry

Where:

 $N_{AR} = \%$  Nutrient As Received  $N_{DM} = \%$  Nutrient Dry Matter Basis DM = % Dry Matter

matter nitrogen to "As Received" for the sample For example, using the formula to convert dry analysis shown on the cover:

 $%N_{AR} = 34.2$ %N<sub>AR</sub> = 142 x 24.1 100

# MANURE AS A RESOURCE SERIES

# For information or assistance with management options, contact your local:

- · Conservation District,
- Cooperative Extension Service or
- Natural Resources Conservation Service.

South Dakota Cooperative Department of Agricultura Extension Service/South Dakota State University Brookings, SD 57007 (605) 688-5144 Engineering Box 2120, SDSU and Biosystems Conservation Districts info@sdconservation.org www.sdconservation.org Pierre, SD 57501-0275 Fax: (605) 895-9424 Association of South Dakota (800) 729-4099 P.O. Box 275

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# with regulatory requirements: For information or assistance Pierre, SD, 57501-3182 (800) GET-DENR -(605) 773-3351 · Fax; (605) 773-5286 South Dakota Department of Environment and Foss Building, 523 E., Capitol Avenue Surface Water Quality Program Natural Resources

Printing of this publication was made possible www.state.sd.us/denr/DES/surfacewater/feedlot.htm

by a Section 319 Nonpoint Source grant to SD DENR from Programs and services are available to everyone on the U.S. Environmental Protection Agency - Region VIII. a nondiscriminatory basis.

SD-NRCS-FS-43 · June 2002

# Calibrating

Calibrating Manure Spreader

MANURE AS A RESOURCE SERIES

**Application Rates** 

ment plan that includes animal manure is the application rate. Calibration of

producers use the nutrients contained

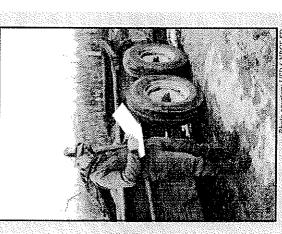
in manure more efficiently.

a manure spreader helps livestock

of a comprehensive nutrient manage-

One of the most critical components

# Application Spreader Nation Rates



courtesy USDA NRCS SD

# in manure according to crop and protects water resources. Applying the nutrients

dollars in fertilizer costs. This publication describes two calibration methods

two hours but can save hundreds of Calibrating a spreader takes one or

that effectively estimate the amount

of nutrients applied to a field.

needs reduces production costs

# One of the keys to successful nutrient management is a sound manure application plan. This includes:

- Setting realistic yield goals.
- Knowing the nutrients available through regular soil and manure tests.
- Crediting nutrient contributions from other sources, such as legumes.
- Kceping records of the rate, method and date of past manure and commercial fertilizer applications.
  - Using best management practices to reduce runoff and the leaching of nutrients.

# Calibrating Manure Spreader Application Rates

The two best approaches for calibrating a manure spreader are the LOAD-AREA and WEIGHT-AREA methods. The load-area method is the most accurate and can be used for both liquid and solid manure. The weight-area method works only with solid or semi-solid manure.

# LOAD AREA METHOD

The load arca method is a three step process.



Photo courtesy Davison County Conservation District

- Determine the amount of manure in the spreader. The most accurate way to determine the amount of manure in a spreader is weighing the spreader when it is empty and again when it is fuil. For a reliable estimate of spreader capac-(recommend five) to determine the average gross Subtract the empty spreader weight. ity, weigh several representative spreader loads Then, calculate the average net loaded weight. weight. **;**
- spread" is determined by measuring the length of the spread pattern should be avoided because Determine the area of spread. The "area of and width of the ground covered by the manure. Width measurements near the beginning and end the spreader may not be operating at full capacity. Allow for the overlap of adjacent passes.
- Calculate the application rate. The application rate is calculated using the formula for either liquid or solid manure.

# Formula for Solid Manure:

Distance Traveled (ft.) x Width of Spread (ft.) Average Loaded Weight (Ibs.) x 21,8 1 fons per acre ≍

# Formula for Liquid Manure;

Distance Traveled (ft.) x Width of Spread (ft.) Tank Volume (gal.) x 43,560 per acre Gallons

# DETERMINING THE AREA OF SPREAD

The "area of spread" is the length and width of nure at varying rates depending on travel and PTO speed, gear box settings, and discharge so the spread pattern is uniform. Accurately measuring the length and width of this area is The area of spread is affected by speed and equipment settings. Spreaders discharge maopenings. It is important to adjust the spreader the ground covered with one load of manure essential

To determine width, measure two adjacent spreads and divide by two to find the "effecping which is often required to make a more tive" spread width. This accounts for overlapuniform application,

The length of spread is determined using the following three values:

- (based on soil and manure tests), 1. desired manure application rate
  - 2. width of the manure spread, and
- 3. manure spreader holding capacity (weight and/or volume)

distance or length of spread using one of the following With these values, calculate the formulas:

Drive over the three tarps at a normal speed to

4,

collect representative manure samples.

Fold and place the first tarp in the empty bucket

Š

without spilling the manure.

Weigh the bucket, tarp and manure. Subtract the weight of the clean tarp and bucket recorded in

Ġ.

# The Travel Distance (feet) per Load Equals: Formula for Solid Manure:

Average Load Weight (lbs.) x 21.8

Width of Spread (ft.) x Appl. Rate (tons per acre)

# The Travel Distance (feet) per Load Equals: Formula for Liquid Manure:

Repeat the process for each of the two remaining

Step 2.

7.

Tank Volume (gallons) x 43,560 😢

Width of Spread (ft.) x desired Appl. Rate (gallons/acre)

Spread a load. If the distance traveled does not equal the calculated distance, adjust speed or equipment settings.

# WEIGHT AREA METHOD

collecting manure on a tarp or piece of heavy When a scale is not available, the application rate of a box spreader can be estimated by material



Photo courtesy USDA NRCS SD

The weight area method is less accurate than the load area method. This method consists of eight

- Prepare/cut three 56 inch x 56 inch tarps or pieces of heavy material (This size equals 1/2000 of an acre). The pounds of manure collected on a 56 inch square equals tons applied per acre.
- Weigh one of the clean tarps and a large bucket on a platform scale. Record the weight. 4
- In a field, anchor the three tarps ahead of the spreader near the beginning, middle and end of the area that will be spread with one load. m
- Calculate the average weight (pounds) of the manure collected. This value equals the tons of manure applied per acre. ∞:

11 Factor for converting pounds to tons and square feet to acres. (21.8 = 43,560 sq. ft. per acre divided by 2000 lbs./fon)
21 The factor for converting square feet to acres = 43,560.

# Manure Spreader Calibration Worksheet

Spreade	r Calibration for:	W	/ulf Cattle Depot		County:	7774074 7774000 and all Constitution (1984)	Corson
Date of C	Calibration:		Applicatio	n Type:	O Liquid	0	Solid
Manure A	Analysis	N		P <sub>2</sub> O <sub>5</sub>		K₂0	
Solid N	lanure Calibra	ation:					
Type of S	Spreader:	·	·		_ Size of Sp	reader (Bu.):	
Moisture	Content:	) Wet	Moist 🔘 [	Ory Be	edding Amount:		
	Spreader Empty		Spreader Fu Load	ıll Weigh I Numbe			
Scale #	Weight (lbs.)	1	2	3	4	5	
1							
2				········		<u> </u>	1000
3							
4	***		: : : : :				
5							Average load Weight (lbs. and
6	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						tons)
Totals =	-						lbs.
	Tons/Load	· · · · · · · · · · · · · · · · · · ·					Tons
Actual an	plication rate:						
Dista	•		Spread	3			
Trave		ft,	x Width		ft. =		Acres <sup>1</sup>
				Actual Ma	nure Applied:		
	Nive	rianta Annlia	d (lbs per ac):		, ,		
Acres = D	istance x Width / 4.		a (los per ac).	N [	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Unloading	g travel distance						
Desir			Spread		Requ	uired	
Applicatio			× Width	3 8 46 %		nce	Ft.
		Nutrients Applie	ed (lbs per ac):	V	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Desir Applicatio			Spread x Width		Requ		TFt.
Аррисацо	<del></del>	lutrients Applie			ft. Dista		
Desir		attients Applie			P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O[]	
Application			Spread x Width	0	ft. Requ	- 1	Ft.
		lutrients Applie			P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
lote: Adjust	t travel speed and/	or spreader disc	harge rate if the cal	culated trav		L	eved.
Comments	:	·		<u> </u>			
1		-			A Property of		
		4	11 158		and the engineering		

Section P: Instruction to Calculate Manure Application Rates

# Nutrient Management Planning Tool Spreadsheet Instructions

# Introduction

This "Nutrient Management Plan" consists of multiple spreadsheets designed to determine and document the necessary land base (acres) required to safely land SD-CPA-63A apply manure generated by a livestock operation. The spreadsheets are made up of the following pages: Total Nitrogen and Phosphorus Produced from Livestock Feeding Operation(s)

SD-CPA-63B - Part 1 --

Field Information; Part 2 - Estimated Nutrient Requirement; Part 3 - Planned Nutrient Requirements; Part 4 - Nutrient Application

Summaries to document manure application can be printed from the main menu or from the heading in column 37. There is a summary for DENR permitted facilities or an agonomic summary for non-permitted facilities. There are pop-up windows available to assist in calibrating equipment (main menu and in heading of column 37), and calculating commercial fertilizer blends (heading of column 38).

# Where to Start

outline the fields that are suitable to safely land apply manure. This is an important step to an orderly assembly of field information needed to make entries on the spreadsheets. For instructions on how to develop plan maps and other documents needed in the nutrient management plan, refer to Begin the nutrient planning process by first collecting a set of aerial plan maps of land available for manure application. On these maps, the "Supporting Documents" section found on page 5 below.

# Spreadsheet Capacity

SD-CPA-63B is designed with a capacity to enter land base information for up to 126 fields. Initially, 27 lines will appear on the spreadsheet to enter field information. If more lines are needed, the spreadsheet capacity can be increased in 33 line increments by pressing the "Add Fields" button located at the bottom of worksheet.

# Instructions

Complete the following in the main menu screen:

- Operator: Enter the facility or land operator name.
- County: Enter the county where the feeding operation is located.
- Prepared By: Enter the name of the person completing the nutrient management plan spreadsheets.
  - Date: Enter the date the plan was prepared.
- Crop Year: Enter the year of the 1st growing season.

Click on the grey box to go to the corresponding section within this plan.

# SD-CPA-63A - Total Nitrogen and Phosphorus Produced from Operation (Columns 5-16)

Note: This spreadsheet must be filled out to allow proper functioning of Spreadsheet 63B.

- No. of animals: Enter number of animals confined at the facility (those confined for a total of 45 days or more in a 12 month period). 5. **Type of Animals:** Enter the type of animal confined at the facility. 6. No. of animals: Enter number of animals confined at the facility (4)

- 7. Avg. weight: Enter the average weight of the animals.
- Days of Confinement: Enter the maximum number of days that the animals will be confined per year. ∞i
- confinement has been entered. Both the organic and inorganic forms of nitrogen are considered in arriving at the initial pounds of nitrogen. N and P<sub>2</sub>O<sub>5</sub> Total: An estimated total pounds of nitrogen and phosphorus will be automatically calculated after the number of days of 6
- Percent N retained during handling / storage: Select from the drop down list the type of manure handling that best represents the facility. The % Nitrogen (N) retained will be automatically calculated and appear to the right of the entry. Press the "System Description" tab at the bottom of screen for a description of handling/storage systems.
  - Total N available for application: The total pounds of nitrogen available for application will be calculated after the manure storage option has been entered.
- Time of application: Choose the time of application from the drop down list that represents your manure application practices.
- N Retained Application method and % retained after application: Select from the drop down list the appropriate application option. The % Nitrogen (N) retained will be calculated after the manure application option has been entered.
  - 14. Total N retained in field: This value will be automatically calculated.
- represents the handling method that is or will be used. The estimated % inorganic Nitrogen (N) available over a 3 year mineralization period 3-Yr. Mineralization Rate: The rate is based on type of manure handling. Choose from the drop down list the option that most closely will appear to the right of the entry.
- calculated. Cumulative totals will be shown on the lower right corner of this spreadsheet, and also carried over to the bottom of Spreadsheet N and  $P_2O_5$  Available for the Crop: The total pounds of Nitrogen (N) and Phosphorus ( $P_2O_5$ ) available for crops will be automatically 16.

# SD-CPA-63B (Part 1) - Field Information (Columns 17-28):

- 17. Field ID: Enter the field identification number or name (from plan map).
- Date Entered in Plan: Enter the date that the field was added to the Nutrient Management Plan.
- 19. Beginning acres in field: Enter the total number of acres within the boundaries of the field, including all setback and/or exclusion areas.
  - 20. County: Enter the county where the field is located.
- Soil Map Unit: Enter the most predominant soil map unit symbol for the field (from plan map).
- Field Location: Enter the legal description of each field to the nearest quarter/half section of land.
- Predicted Soil Loss using RUSLE: Enter the calculated estimated water erosion (soil loss) figure, which is expressed in tons/ac/yr. This number is derived from an erosion prediction program called the Revised Universal Soil Loss Equation (RUSLE2). Use NRCS Form SD-CPA-29 to document calculations. Information about this computer program is available at the local Natural Resources Conservation Service (NRCS) office.
- Control of Land: If the field is owned or leased by the livestock Operator, check the box. If the field is neither owned or leased, leave

- 25. Acres Excluded from Manure Application: These 2 columns address the acres that will be excluded from manure application to minimize foot vegetated "buffer" or "setback" is needed along all drainage ways or other water bodies in the field. Record the number of acres to be excluded, also consider all of the following "Drainages", "Wetlands", "Slope" or any "Other" exclusions. (Determine and measure the risk of potential nutrients or pollutants from leaving the fields and reaching surface waters. From a field assessment, indicate if a 100 acres from the plan map).
- 26. Irrigated: Place a check in the box if the field is irrigated.
- 27. No-till: Check this box if the tillage/planting system that the land operator plans to use is a no-till, ridge-till or strip-till planting system.
- Current Soil Test: Enter the appropriate N, P and K test results from the land operator's current soil test report from the lab. The value for (Refer to the SDSU EC 750 "Fertilizer Recommendations Guide" (Page 4) for additional information). Reminder: Sampling and testing for Next, select the type of phosphorus extraction method used at the testing lab (shown on the lab report). Enter the potassium from the lab worksheet column labeled as "2-4 foot". The nitrate nitrogen in the 2-4 foot sample is automatically adjusted based on the test results. N is reported in Ibs/ac for a normal 0-2 foot sample. If a deeper 2-4 foot sample was collected and tested, enter the test results in the N and P is required prior to manure application but only P is required for initial planning purposes.

This spreadsheet can be sorted by clicking on the heading in columns 17 through 23.

results. Enter the date that the soil sample was collected.

# SD-CPA-63B (Part 2) - Estimated Nutrient Requirement (Columns 29-31):

- Crops and Average Yield in Rotation: Enter crops from the drop down lists. First, enter the crop grown the year prior to writing the NMP Yield Goal" you can manually enter a yield for each crop. Enter actual or expected yields if either of the previous methods do not accurately eflect field conditions. Proof of field-by-field or farm-by-farm yields shall be based on an average of actual crop receipts from a minimum of three consecutive years. If there is no yield information available for a crop listed in the nutrient management plan, documentation from These yields can be over-ridden by entering a number in the yellow box to the right (Actual Yield column). (3) By choosing "Actual or or manure application. Then enter the projected crops to be grown in the next two years. Using the 3 buttons in the top header of these Statistics Service publication current five-year county average yields. Note: Both these yields are already increased by 10 percent. columns crop yields can automatically be calculated based on one of three methods: (1) South Dakota Agricultural Statistics Service (SDASS) county five-year average yield indexed by the predominant soil type productivity index (PI), (2) South Dakota Agricultural
- ields identified as "Phosphorus Crop Removal" may be used for manure application, however, they are not used on the spreadsheet to meet 30. Initial Nutrient Mgt. Plan - N based field Acres: This column automatically calculates acres, but for nitrogen based fields only. Any and base requirements. Fields with "No Application" acres will not be used to meet land based requirements.
- 31. Nutrient Recommendations: The computer program automatically makes plant nutrient recommendations (lbs/ac) based on the SDSU EC 750 "Fertilizer Recommendations Guide"

and P2O5 required by fields". There is also a statment in red indicating if there is adequate acres available based on the Nitrogen analysis and if there is At the bottom of column 31 is a summary of "Total Ibs of N and P2O5 available for the crops" (nutrients in manure - from CPA-63A), and "Total Ibs of N available acres are at 50 ppm olson or 75 ppm bray1, this is usually when the field is in the phosphorus based catagory. see N-P table in main menu a phophorus increase anticipated in the fields. If there is a phosphorus buildup expected, an approxímate number of years will be given until all the This is the end of what is considered the Initial Plan and can be printed by clicking the Print button at the top of the spreadsheet, (remember to print CPA-63A). Complete the remaining part of the spreadsheet when manure application in taking place.

# SD-CPA-63B (Part 3) - Planned Nutrient Application (Columns 32-36):

- Manure application based on: A field is generally considered Nitrogen based when the P soil test level is below 50 ppm Olsen or 75 ppm crop or future crops in the rotation before more phosphorus is applied. See column 40 to know how many years until the P2O5 is used and Removal, manure may still be applied according to nitrogen crop needs; however, the amount of phosphorus applied must be used by the Bray; generally Phosphorus Crop Removal (phosphorus based) if above these levels. When a field is designated as Phosphorus Crop the field is available for more manure applications. A "No Application" appears in this column when the P soil test level for a field is greater than 100 ppm Olsen or 150 ppm Bray (which exceeds the limits set in South Dakota), or if the Predicted Soil Loss (column 23) exceeds 6 tons/ac/yr. See N-P table in main menu.
- Manure Application and Incorporation: Select the type of manure planned (Liquid or Solid) and the method of manure application. This will determine a nitrogen mineralization rate. 33.
- Manure Test: Using the lbs/ton or lbs/1000 gal. enter the total nitrogen, inorganic nitrogen (ammonium N), total P2O5 and total K2O test results from the manure analysis report. A number must be entered in all four columns. Reminder: Check and ensure that the P2O5 and K20 test results are used, not elemental P and K. 34.
- Available N (first crop year): The computer program automatically makes a determination of available nitrogen. Includes Inorganic Nitrogen Retained and Organic Nitrogen. 35.
- nitrogen recommendation for the planned crop. At that rate the amount of manure required to evenly apply to all the available acres in the Maximum Manure Application: The computer program automatically makes a manure application rate determination that reflects the field will be given in the "Quantity of Manure" column.

# SD-CPA-63B (Part 4) - Nutrient Application (Columns 36-35):

37. Acres of Actual Manure Application: Enter the actual amount of acres that manure was applied.

- At the top of this column are three buttons: "DENR Summary" and "Agronomic Summary" summarizes nutrient application by field, print Manure Application: Enter the actual amount of manure that the operator applied (tons/ac or gallons/ac), date of application and time of these out on an annual basis to document manure application (rather than the entire form); "Manure Ratc Calculator" is a pop-up day (This is a matter of record to help support the timeframe of the manure haul - required for State Permitted Facilities) worksheet that is designed to assist in calculating actual manure application rates, speeds, and distances. 38.
- Summary" worksheet. The amount of available nutrients applied from manure will be calculated and displayed in the middle 3 columns and applied, press the "Commercial Application" for a pop-up form. To calculate an estimated value of manure applied, press the "Commercial Prices" button to update current commercial fertilizer prices. The estimated value of manure applied is calculated on the "Agronomic Nutrients Applied: Enter the amount of nutrients applied using commercial fertilizer. To assist in the calculation of actual nutrient the total of manure plus commercial fertilizer will display in the end 3 columns.
- Estimated time to raise P soil test level to 50 ppm Olsen or 75 ppm Bray: This is the estimated time for the crop or future crops in the rotation to use up the phosphorus applied during a nitrogen based application.

# List of summary statements that may appear to reflect adequacy of acres:

# Nitrogen based statements –

- "Adequate acres are available based on Nitrogen analysis". This means the plan meets the Nitrogen based requirements.
- "Inadequate acres are available based on Nitrogen analysis". This means that additional land mus t be added to the plan to utilize the manure nitrogen produced by the livestock operation.

# Phosphorus Crop Removal (phosphorus based) statements --

- "Phosphorus (P<sub>2</sub>O<sub>5</sub>) removal exceeds or is in balance with crop needs". This means the plan meets the Phosphorus based requirements.
- years to build all listed fields up to 50 ppm P (Olsen)". This means the plan meets the Phosphorus based requirements. Note: A low single digit number is evidence that the operation has adequate " $P_2O_5$  is in excess of removal. At this rate, it will take approximately\_
  - acres only for the short term adding and using more land for manure application now is recommended as a means to slow phosphorus
- "Inadequate acres are available based on Phosphorus analysis". This means that additional land must be added to the plan to utilize the manure phosphorus produced by the livestock operation.

# Supporting Documents -

# The following documents must be included with the Initial Nutrient Management Plan spreadsheets:

Copies of aerial photo plan maps that identify fields selected for manure application. Outline each field with a bold line boundary and label each with the following: (if possible, use ArcGIS or similar software to develop maps) ä

Field ID Acres

(Example: Field 1) (Example: 80 acres)

(Example: Cropland) - Land use

(Example: Soil CaB) - Predominant soil map unit symbol (from soil survey map) The field ID may be a simple sequential numbering system, favorite field name or FSA Tract and field number.

The top of each map should be labeled "Water Quality Risk Assessment Map" along with the legal description (Section, Township,

where manure will not be applied. If specific state and local compliance requirements are not known, contact the South Dakota DENR or Locate and clearly outline (preferably cross-hatch) exclusion areas, setbacks or buffer areas around sensitive areas in fields or landscapes local NRCS/Conservation District office for information.

Identify and mark the location of the headquarters, feedlots and water wells.

Make field risk assessments by analyzing surface water and aquifer resource information. Label fields that have a high vulnerability for nitrate leaching to an aquifer and/or phosphorus loss to surface waters. (Example: L = High leaching risk; R = High runoff risk). For guidance on how to make assessments, contact the South Dakota DENR or local NRCS/Conservation District office.

- NRCS soil survey maps of all the fields in the plan, along with a soil map unit legend. Mark each map with a legal description. ن
- ivestock operator. The written agreements will include, at a minimum, the legal description of individual fields, acres available for manure If applicable, include a copy of signed manure application lease agreements executed with the land owner for fields not owned by the application, and time period (length in years) of the agreement. Agreements must be for at least one year. ڼ
  - Copies of current soil test reports (showing phosphorus test results) for all fields in the plan. (Reminder: the proper sampling depth for a phosphorus test is the top 0-6 inches of soil). ö
- Document the calculations on NRCS Form SD-CPA-29. For information on how to do RUSLE2 calculations, contact the Natural Resources Copies of calculations showing the predicted water erosion (soil loss) using the Revised Universal Soil Loss Equation (RUSLE2) Conservation Service (NRCS) ď

# Additional Information –

For additional information on Manure and Nutrient Management or links to other websites, visit the South Dakota NRCS website at: offer Henrie of arm with an Habinial Mithigant Managaman bimi Section Q: Manure Test Records



Dairyland Laboratories, Inc.

217 E. Main St Arcadia, WI 54612

Telephone: 608-323-2123 Fax: 608-323-2184

Email: info@dairylandlabs.com

To: Wulf Cattle Depot 26583 109th Street McLaughlin, SD 57642

Account No .:

1002 (18)

Report Date:

Sample No.:

Sampled By:

Wulf Cattle Depot

Sampled For:

WULF CATTLE DEPOT

9/16/2020

001-2009-003365

Product:

MATERIAL:

#1

## MANURE ANALYSIS REPORT

ANALYSIS RESULTS

SAMPLE ID SAMPLE NAME:

#1

Beef STORAGE SYSTEM: Solid

ACTUAL ANALYSIS

MOISTURE: 26.15% SOLIDS: 73.85% NITROGEN: 0.93% AMMONIA NITROGEN: 0.06% PHOSPHORUS: 0.58%

POTASSIUM: 1.20%

Total Nutrients Estimated 1st year Available Nutrients

----- Time to incorporation ------

>72 hours or not | | <1 hour or incorporated | 1 to 72 hours | injected

lbs/ton 18.60

lbs/ton 5.58

6.51

NITROGEN PHOSPHATE 26.60 POTASH 28.80

21.28 23.04

21.28 23.04

AMMONIA NITROGEN 1.20

> TOTAL VALUE \$16.99

\$17.32

\$17.64

## COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.

4.65

21.28

23.04

Availability of N changes depending on application technique. Injection or incorporation within 3 days of application results in higher N availability.

Value based on commercial fertilizer costs as of 7/27/2020.

0.35/lb

P205 (Triple Superphosphate)

5 (Elemental Sulfur)

0.43/lb

K20 (Potash)

0.27/lb 0.40/lb

Billing Information

Sampled By: Sampled For: Wulf Cattle Depot

WULF CATTLE DEPOT

Product: #1 Reference:

0757012

Date:

9/16/2020

Sample No.:

001-2009-003365





Dairyland Laboratories, Inc.

217 E. Main St. Arcadia, WI 54612

Email: info@dairylandlabs.com

Telephone: 608-323-2123 Fax: 608-323-2184

> Account No.: 1002 (18)

Sampled By: Wulf Cattle Depot

Sampled For: WULF CATTLE DEPOT

26583 109th Street McLaughlin, SD 57642

To: Wulf Cattle Depot

Product:

#2

## MANURE ANALYSIS REPORT

ANALYSIS RESULTS

SAMPLE ID

SAMPLE NAME: MOISTURE: MATERIAL: Beef SOLIDS: 84.10% STORAGE SYSTEM: Solid NITROGEN: 1.11%

AMMONIA NITROGEN: 0.10% PHOSPHORUS: 0.66% POTASSIUM: 1.59%

ACTUAL ANALYSIS

Estimated 1st year Total Available Nutrients Nutrients

> ----- Time to incorporation ------>72 hours or not | | <1 hour or

incorporated | 1 to 72 hours | injected

lbs/ton lbs/ton 22.20 5.55 6.66 7.77 NITROGEN 24.16 24.16 PHOSPHATE 30.20 24.16 30.56 30.56 30.56 POTASH 38.20

AMMONIA NITROGEN 2.00 TOTAL VALUE \$20.57 \$20.96 \$21.34

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.

Availability of N changes depending on application technique. Injection or incorporation within 3 days of application results in higher N availability.

Value based on commercial fertilizer costs as of 7/27/2020.

N (Urea) 0.35/lb

P205 (Triple Superphosphate) 0.43/lb K20 (Potash) 0.27/lb

S (Elemental Sulfur) 0.40/lb

Billing Information

Sampled By: Wulf Cattle Depot

WULF CATTLE DEPOT Sampled For:

001-2009-003366 Sample No.: Product: #2

> DAIRYLAND Laboratories, Inc.

Report Date:

Sample No.:

001-2009-003366

9/16/2020

0757013 9/16/2020

Date:

Reference:



Dairyland Laboratories, Inc.

217 E. Main St. Arcadia, WI 54612

Email:

Telephone: 608-323-2123 Fax: 608-323-2184

info@dairylandlabs.com

Report Date: 9/16/2020

Wulf Cattle Depot

Sample No.: 001-2009-003367

To: Wulf Cattle Depot Account No.: 1002 (18)

26583 109th Street Sampled By:
McLaughlin, SD 57642

Sampled For: WULF CATTLE DEPOT

Product: #3

## MANURE ANALYSIS REPORT

ANALYSIS RESULTS

SAMPLE ID ACTUAL ANALYSIS

SAMPLE NAME: #3 MOISTURE: 99.81% MATERIAL: SOLIDS: 0.19% Beef STORAGE SYSTEM: Liquid NITROGEN: 0.01% AMMONIA NITROGEN: 0.01% PHOSPHORUS: 0.01% POTASSIUM: 0.04%

0.33 0.42 NITROGEN 0.83 0.25 PHOSPHATE 1.90 1.52 1.52 1.52 3.19 3.19 POTASH 3.98 3.19 AMMONIA NITROGEN 0.42 \$1.65 TOTAL VALUE \$1.59 \$1.62

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.

Availability of N changes depending on application technique. Injection or incorporation within 3 days of application results in higher N availability.

Value based on commercial fertilizer costs as of 7/27/2020.

N (Urea) 0.35/lb P205 (Triple Superphosphate) 0.43/lb K20 (Potash) 0.27/lb S (Elemental Sulfur) 0.40/lb

**Billing Information** 

Sampled By: Wulf Cattle Depot Sampled For: WULF CATTLE DEPOT

Product: #3

Reference: 0757014 Date: 9/16/2020

Sample No.: 001-2009-003367





Laboratories, Inc.

26583 109th Street

McLaughlin, SD 57642

To: Wulf Cattle Depot

Dairyland Laboratories, Inc.

217 E. Main St. Arcadia, WI 54612

Telephone: 608-323-2123 Fax: 608-323-2184

Email: info@dairylandlabs.com

> Account No.: 1002 (18)

Sampled By: Wulf Cattle Depot

Sampled For: WULF CATTLE DEPOT

Report Date:

Sample No.:

9/16/2020

001-2009-003368

Product: #4

## MANURE ANALYSIS REPORT

ANALYSIS RESULTS

SAMPLE ID SAMPLE NAME: #4

MOISTURE: 99.77% MATERIAL: Beef SOLIDS: 0.23% STORAGE SYSTEM: Liquid NITROGEN: 0.01%

AMMONIA NITROGEN: 0.01% PHOSPHORUS: 0.01% POTASSIUM: 0.04%

ACTUAL ANALYSIS

Total Estimated 1st year Nutrients Available Nutrients ----- Time to incorporation ------>72 hours or not | <1 hour or incorporated | 1 to 72 hours | injected

lbs/1000 gal lbs/1000 gal NITROGEN 0.83 0.25 0.33 0.42 PHOSPHATE 1.90 1.52 1.52 1.52 POTASH 3.98 3.19 3.19 3.19 AMMONIA NITROGEN 0.43

> TOTAL VALUE \$1.59 \$1.62 \$1.65

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.

Availability of N changes depending on application technique. Injection or incorporation within 3 days of application results in higher N availability.

Value based on commercial fertilizer costs as of 7/27/2020.

N (Urea) 0.35/lb P205 (Triple Superphosphate) 0.43/lb K20 (Potash) 0.27/lb S (Elemental Sulfur) 0.40/lb

Billing Information

Sampled By: Sampled For: Wulf Cattle Depot

#4

WULF CATTLE DEPOT

Product:

Reference:

0757015

Date:

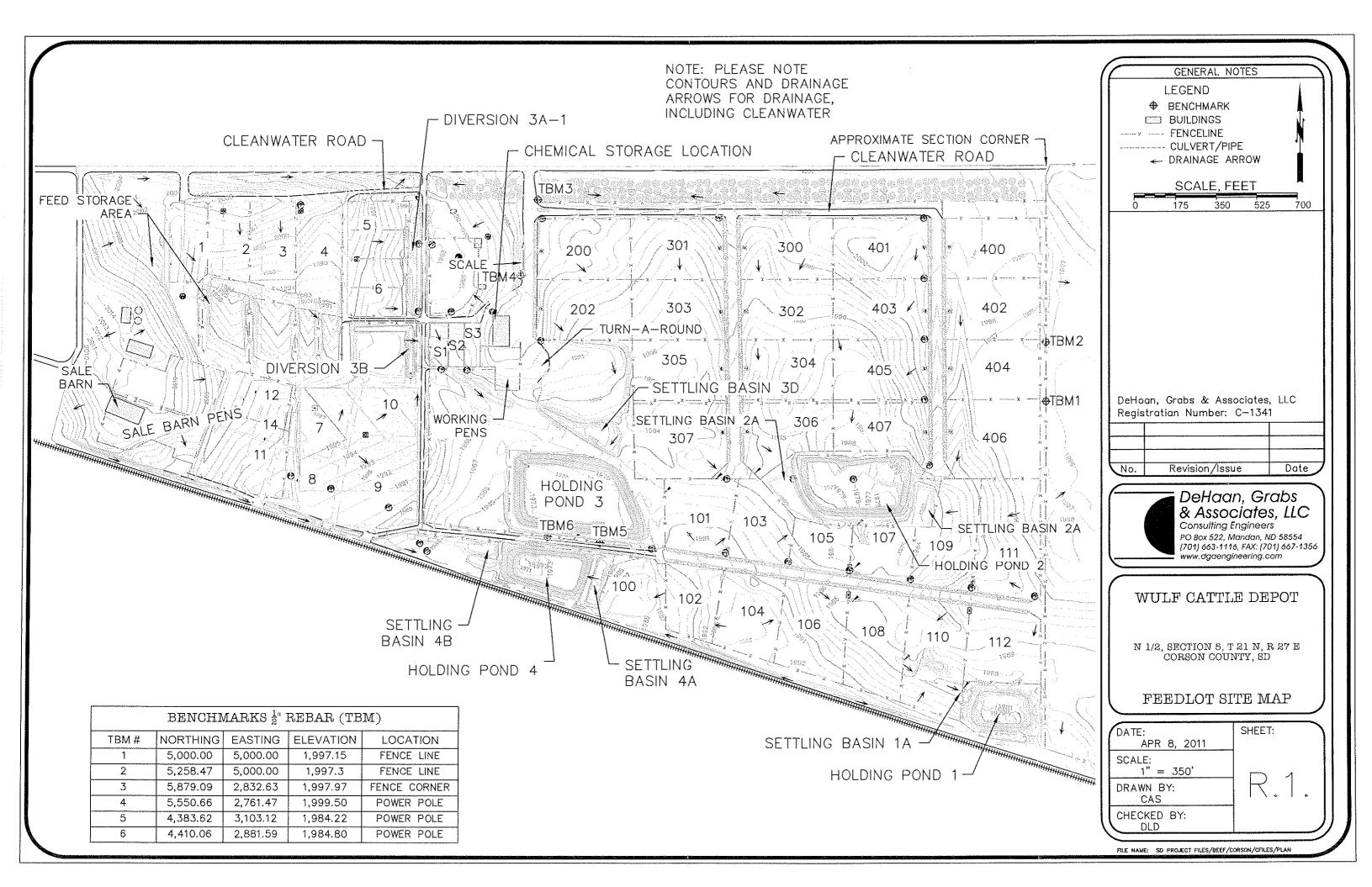
9/16/2020

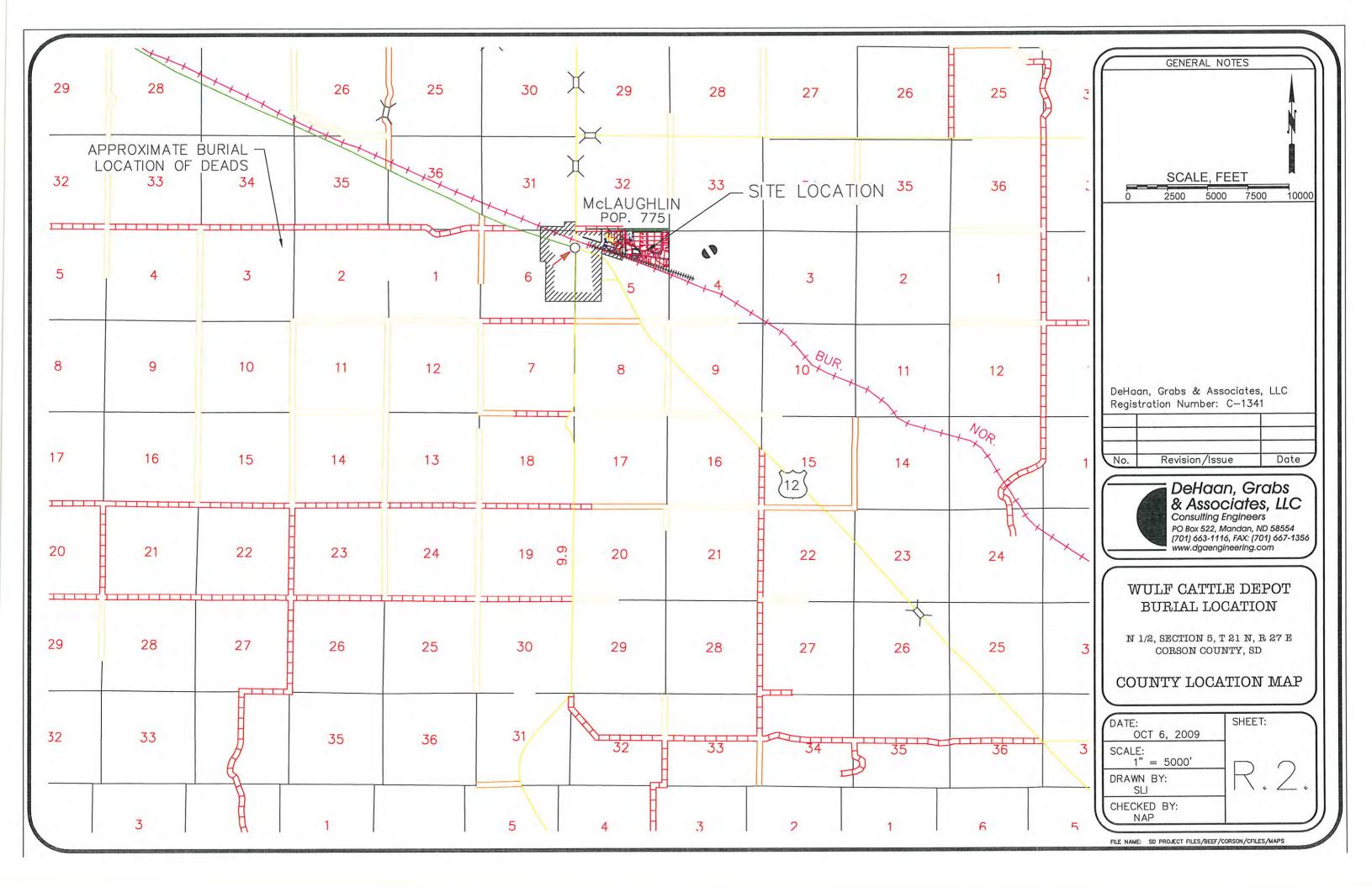
Sample No.:

001-2009-003368

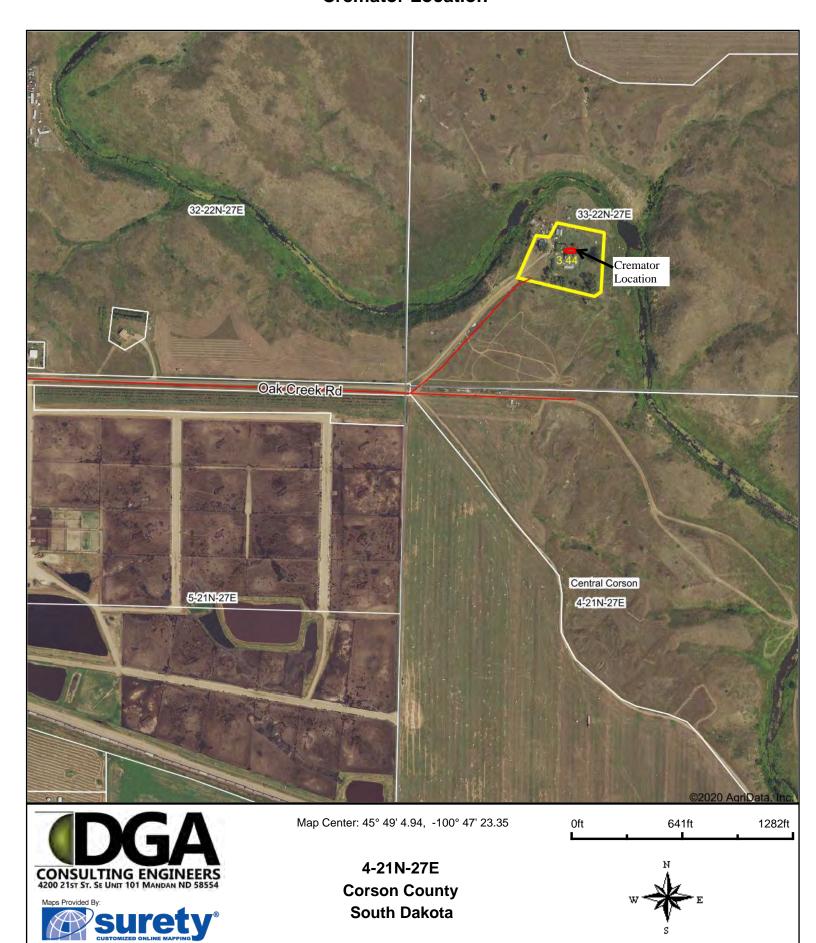


Section R: Facility Maps





# **Cremator Location**



Field borders provided by Farm Service Agency as of 5/21/2008.

9/25/2020

Section S: Engineering Calculations for Storage Considerations

# S. Facility Design Calculations

## Rainfall, Runoff & Facility Information A.

- Rainfall Data
  - a.
  - b.
  - C.
  - d.

	Rain a. b. c. d.	Calculations  unoff & Facility Information fall Data  Annual Rainfall = 17.4 inches Annual Runoff = 15.7% of Annual 25 Yr 24 Hr Storm Rainfall = 3.9 in Annual Lake Evaporation = 35.3 in	Rainfall for CN 9	CDADC	ALTO LEE TO BE THE STATE OF THE
Dra		sured Areas area - Pens	108.0	Acres	
		rea – Farmstead/Roads	45.3	Acres	
		nage Area	153.3	Acres	
Hol	ding Po	nd Surface Area at Top of FB	375,222	Sq. Ft.	

3. Drainage Area Average Curve Number

Drainage Area Designation	Curve Number
Pens (DA-P)	90
Farmstead, Roads (DA-FR)	79

Hydrologic Soil Group B was used for all Drainage areas and was based off of the USDA Soil Survey. The fair Hydrologic Condition of the soil was used as a conservative assumption.

Average CN is equal to the sum of the products of each of the CN designation areas and their respective CN's divided by the total drainage area.

(	DA-P	x	CN-P	+	DA-FW	x	CN-FR	)	1	DA-Total	=	Average CN
(	108	X	90	+	45.3	X	79	)	1	153.3	=	87

## 4. **Runoff Calculations**

Annual Runoff

To estimate annual runoff from a curve number of 87, a conservative approach was used as a curve number 90 was used. Therefore 0.157 x 17.4" the runoff for this site is.

25 Yr 24 Hr Storm Runoff for a CN 87 (Soil Conservation method) = b. Inches

# B. Holding Pond Storage Components

# 1. 25 Yr 24 Hr Storm Runoff Volume

Storm Runoff Volume (SRV) = Drainage Area (DA) x 25 Yr 24 Hr Storm Runoff (SR)

DA (ac)	X	SR (in)	х	Units Conversion	=	SRV (ft <sup>3</sup> )
153.3	X	2.5	X	3,630	=	1,391,198

# 2. Annual Runoff Volume

Annual Runoff Volume (ARV) = Drainage Area (DA) x Annual Runoff (AR)

DA (ac)	X	AR (in)	X	Units Conversion	=	ARV (ft <sup>3</sup> )
153.3	X	2.7	X	3,630	=	1,502,493

# 3. 25 Yr 24 Hr Rainfall on Pond Surface

25 Yr 24 Hr Rainfall on Pond Surface Volume (SRNV) = Holding Pond Surface Area at Top of Berm (PSA) x 25 Yr 24 Hr Storm Rainfall (SRN)

PSA (ft <sup>2</sup> )	X	SRN (in)	X	Units Conversion	=	SRNV (ft <sup>3</sup> )
375,222	X	3.9	X	0.0833	=	121,898

# 4. Annual Rainfall on Pond Surface

Annual Rainfall on Pond Surface Volume (ARNV) = Holding Pond Surface Area at Top of Berm (PSA) x Annual Rainfall (ARN)

PSA (ft <sup>2</sup> )	X	ARN (in)	X	Units Conversion	=	ARNV (ft <sup>3</sup> )
375,222	X	17.4	X	0.0833	=	543,854

# 5. Estimated Annual Evaporation from Pond Surface

The estimated annual evaporation from the pond surface is calculated by multiplying the mean annual lake evaporation by the average evaporation area of the pond. The average evaporation area is the surface area of the pond at the elevation which provides storage that is halfway between the maximum operating volume and the residual water and solids volume.

a. Maximum Operating Elevation = The elevation at which storage equaling Freeboard Storage Volume (Includes Basins Storage-Solids)(FV) minus the 25 Yr 24 Hr Storm Runoff Volume (SRV) minus the 25 Yr 24 Hr Rainfall on Pond Surface Volume (SRNV) is met.

FV (ft <sup>3</sup> )	٤	SRV (ft <sup>3</sup> )	ı, <del>ş</del>	SRNV (ft³)	=	Storage (ft <sup>3</sup> )	Maximum Operating Elevation
3,205,498	-	1,391,198	4	121,898	=	1,692,402	1,981.5

b. Average Evaporation Area = Area at the elevation which provides the average storage volume calculated as follows: (Maximum Operating El.

# Volume + Residual Water and Solids El. Volume) / 2

(	Max Operating El. Volume	+	Residual El. Volume	)	1	2	=	Average Evaporation El. Volume	Average Evaporation Area (ft²)
(	1,199,371	+	115,956	)	1	2	=	848,975	219,917

c. Annual Evaporation Volume (AEV) = Average Evaporation Area (AEA) x
Annual Lake Evaporation (AE)

AEA (ft <sup>2</sup> )	Х	AE (in)	X	Units Conversion	=	AEV (ft <sup>3</sup> )
219,917	X	33.7	X	0.0833	=	617,353

# C. Holding Pond Storage Requirement

Required Storage = Annual Runoff Volume (ARV) + 25 Yr 24 Hr Storm Runoff Volume (SRV) + Annual Rainfall on Pond Surface Volume (ARNV) + 25 Yr 24 Hr Storm Rainfall on Pond Surface Volume (SRNV) - Annual Evaporation Volume (AEV)

	21 12.00	020 4000 15/0222	7.8	01001110 (01		, minuai	Diu	poration v	Jium	C(ALV)
				ARNV	7.7	SRNV		AEV		Required
ARV (ft <sup>3</sup> )	+	SRV (ft <sup>3</sup> )	+	$(ft^3)$	+	$(ft^3)$	+	$(ft^3)$	=	Storage (ft <sup>3</sup> )
1,502,493	+	1,391,198	+	543,854	+	121,898	_	617,353	=	2,942,090

# D. Sediment Basin Solids Storage Requirement

The minimum sediment basin solids storage volume allowed by the SD DENR is 0.6 yd<sup>3</sup> per head. Since actual cattle numbers above any one basin may vary a daily basis based on pen stocking rate, solids storage volume requirements will be based on average pen space per head. The maximum stocking basis on an annual basis is 12,000 ESS/OV

Total Pen Area	1	Total Head #	=	Average Pen Area per Head
4,704,217	1	12,000		392

# 1. <u>Settling Basin 1A</u>

Pen Area	/	Average Pen		$0.6 \text{ yd}^3$		Conversion		Required Solids Storage Volume (ft <sup>3</sup> )
Drained (ft <sup>2</sup> )		Area / Head	X	per head	X	Factor		Storage Volume (ft <sup>3</sup> )
522,375	1	392	X	0.6	X	27	=	21,588

# 2. Settling Basin 2A

Pen Area Drained (ft <sup>2</sup> )	1	Average Pen Area / Head	х	0.6 yd <sup>3</sup> per head	x	Conversion Factor	=	Required Solids Storage Volume (ft <sup>3</sup> )
1,879,238	1	392	x	0.6	X	27	=	77,662

# 3. <u>Settling Basin 3A (since there are long diversions and long flow distances 0.4 will be used for the actual basin.</u>

Pen Area Drained (ft²)	1	Average Pen Area / Head	х	0.6 yd <sup>3</sup> per head	х	Conversion Factor	=	Required Solids Storage Volume (ft <sup>3</sup> )
1,731,437	1	392	X	0.4	X	27	=	47,703

# 4. Settling Basin 4A

Pen Area Drained (ft <sup>2</sup> )	1	Average Pen Area / Head	х	0.6 yd <sup>3</sup> per head	х	Conversion Factor	П	Required Solids Storage Volume (ft <sup>3</sup> )
171,508	1	392	X	0.6	X	27	=	7,088

# 5. Settling Basin 4B

Pen Area Drained (ft <sup>2</sup> )	1	Average Pen Area / Head	х	0.6 yd <sup>3</sup> per head	х	Conversion Factor	=	Required Solids Storage Volume (ft <sup>3</sup> )
399,659	1	392	X	0.6	X	27	=	16,517

