Please print or type in the unshaded areas only. Form Approved. OMB No. 2040-0086.

FORM 1 GENERAL

U.S. ENVIRONMENTAL PROTECTION AGENCY
GENERAL INFORMATION
Consolidated Permits Program
(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

S		T/A	C
F			D
1	2 — 13	14	15

LABEL ITEMS

- I. EPA I.D. NUMBER
- III. FACILITY NAME
- V. FACILITY MAILING ADDRESS
- VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the 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 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 must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

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 **bold-faced terms**.

SPECIFIC QUESTIONS	Mark "X" YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	Mark "X" YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)	16	X 17	18	B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)	X 19	20	21
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)	22	X 23	24	D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)	25	X 26	27
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	28	X 29	30	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)	31	X 32	33
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)	34	X 35	36	H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)	37	X 38	39
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)	40	X 41	42	J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)	43	X 44	45

III. NAME OF FACILITY

C 1 | SKIP | T and T Gilkey

15 | 16 – 29 | 30 — 69

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
C 2 Tosh, James - owner	(731) 243-4861
15 — 16 — 45	46 — 48 — 49 — 51 — 52- — 55

V. FACILTY MAILING ADDRESS

A. STREET OR P.O. BOX

C 3 1586 Atlantic Anenue

15 — 16 — 45

B. CITY OR TOWN	C. STATE	D. ZIP CODE
C 4 Henry	TN	38231
15 — 16 — 40	41 — 42	47 — 51

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

C 5 1400 Gilkey Road

15 — 16 — 45

B. COUNTY NAME

Henry

46 — 70

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
C 6 Henry	TN	38231	
15 — 16 — 40	41 — 42	47 — 51	52 — -54

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	B. SECOND
7 0213 *(specify)* Swine Production	7 *(specify)*
C. THIRD	**D. FOURTH**
7 *(specify)*	7 *(specify)*

VIII. OPERATOR INFORMATION

A. NAME	B. Is the name listed in Item VIII-A also the owner?
8 Jamey Tosh	☑ YES ☐ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other," specify.)*

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

P *(specify)*

D. PHONE *(area code & no.)*

A (731) 243-4861

E. STREET OR P.O. BOX

1586 Atlantic Anenue

F. CITY OR TOWN	G. STATE	H. ZIP CODE	IX. INDIAN LAND
B Henry	TN	38231	Is the facility located on Indian lands? ☐ YES ☑ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*	D. PSD *(Air Emissions from Proposed Sources)*
9 N TN0074888	9 P
B. UIC *(Underground Injection of Fluids)*	**E. OTHER** *(specify)*
9 U	9 *(specify)*
C. RCRA *(Hazardous Wastes)*	**E. OTHER** *(specify)*
9 R	9 *(specify)*

XI. MAP

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 location of each of its existing and proposed intake and discharge structures, each 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 16 barn facility and the waste is stored in three lagoons.

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained 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
James Tosh (Owner)		2/22/18

COMMENTS FOR OFFICIAL USE ONLY

C

EPA Form 3510-1 (8-90)

Form Approved
OMB No. 2040-0250

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

FORM 2B NPDES

EPA

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

I. GENERAL INFORMATION Applying for: Individual Permit ☑ Coverage Under General Permit ☐

A. TYPE OF BUSINESS	B. CONTACT INFORMATION	C. FACILITY OPERATION STATUS
☑ 1. Concentrated Animal Feeding Operation (complete items B, C, D, and section II) ☐ 2. Concentrated Aquatic Animal Production Facility (complete items B, C, and section III)	Owner/or Operator Name: Jamey Tosh Telephone: (731) 243-4861 Address: 1586 Atlantic Ave Facsimile: ( ) City: Henry State: TN Zip Code: 38231	☑ 1. Existing Facility ☐ 2. Proposed Facility

D. FACILITY INFORMATION

Name: T and T Gilkey Telephone: (731) 243-4861
Address: 1400 Gilkey Rd Facsimile: ( )
City: Henry State: TN Zip Code: 38231
County: Henry Latitude: 36.169126 Longitude: -88.418252

If contract operation: Name of Integrator: Tosh Pork
Address of Integrator: 1586 Atlantic Ave Paris TN 38231

II. CONCENTRATED ANIMAL FEEDING OPERATION CHARACTERISTICS

A. TYPE AND NUMBER OF ANIMALS

1. TYPE	2. ANIMALS: NO. IN OPEN CONFINEMENT	2. ANIMALS: NO. HOUSED UNDER ROOF
☐ Mature Dairy Cows		
☐ Dairy Heifers		
☐ Veal Calves		
☐ Cattle (not dairy or veal calves)		
☑ Swine (55 lbs. or over)		16,000
☐ Swine (under 55 lbs.)		
☐ Horses		
☐ Sheep or Lambs		
☐ Turkeys		
☐ Chickens (Broilers)		
☐ Chickens (Layers)		
☐ Ducks		
☐ Other: Specify _____		
3. TOTAL ANIMALS		16,000

B. MANURE, LITTER, AND/OR WASTEWATER PRODUCTION AND USE

1. How much manure, litter, and wastewater is generated annually by the facility? _____ tons 14392447 gallons
2. If land applied how many acres of land under the control of the applicant are available for applying the CAFOs manure/litter/wastewater? 546.1 acres
3. How many tons of manure or litter, or gallons of wastewater produced by the CAFO will be transferred annually to other persons? _____ tons 0 gallons

[redacted]

Form Approved
OMB No. 2040-0250

C. ☐ TOPOGRAPHIC MAP

D. TYPE OF CONTAINMENT, STORAGE AND CAPACITY

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

2. Report the total number of acres contributing drainage: 0 acres

3. Type of Storage	Total Number of Days	Total Capacity (gallons/tons)
☑ Anaerobic Lagoon	475	27649072
☐ 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 application is not complete until a nutrient management plan is submitted to the Permitting Authority.

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

2. If no, please explain:

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

4. The date of the last review or revision of the nutrient management plan. Date: 5/31/12

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

F. LAND APPLICATION BEST MANAGEMENT PRACTICES

Please check any of the following best management practices that are being implemented at the facility to control runoff and protect water quality:

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

Form Approved
OMB No. 2040-0250

III. CONCENTRATED AQUATIC ANIMAL PRODUCTION FACILITY CHARACTERISTICS

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

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

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

1. Ponds	2. Raceways	3. Other

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

1. Receiving Water	2. Water Source

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

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

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

1. Month	2. Pounds of Food

IV. CERTIFICATION

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

A. Name and Official Title (~~print or type~~)	B. Telephone (731) 243-4861
James Lost	
C. Signature	D. Date Signed 2/22/18

NRCS Natural Resources Conservation Service

Comprehensive Nutrient Management Plan (CNMP)
(Version 3, 8/17/2016 Format)

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 information for the AFO.

Farm/Facility: T & T Gilkey
1400 Gilkey Road
Henry, TN 38231
731-243-4861

Mailing Address: 1586 Atlantic Avenue
Henry, Tn 38231

Owner/Operator: James A Tosh

Plan Period: Oct 2017 - Sep 2022

Certified Comprehensive Nutrient Management Plan (CNMP) Planner

As a Certified Comprehensive Nutrient Management Plan (CNMP) Planner, I certify that I have reviewed the *Comprehensive Nutrient Management Plan* and that the elements of the document are technically compatible, reasonable and can be implemented.

Signature: _____ Date: 2-22-18
Name:
Title: TSP Certification Credentials:

Conservation District (Optional)

As a Conservation District employee, I have reviewed the *Comprehensive Nutrient Management Plan* and concur that the plan meets the District's conservation goals.

Signature: _____ Date: _____
Name:
Title:

Owner/Operator

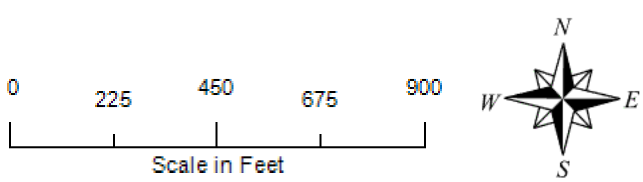
As the owner/operator of this CNMP, I, as the decision maker, have been involved in the planning process and agree that the items/practices listed in each element of the CNMP are needed. I understand that I am responsible for keeping all necessary records associated with implementation of this CNMP.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

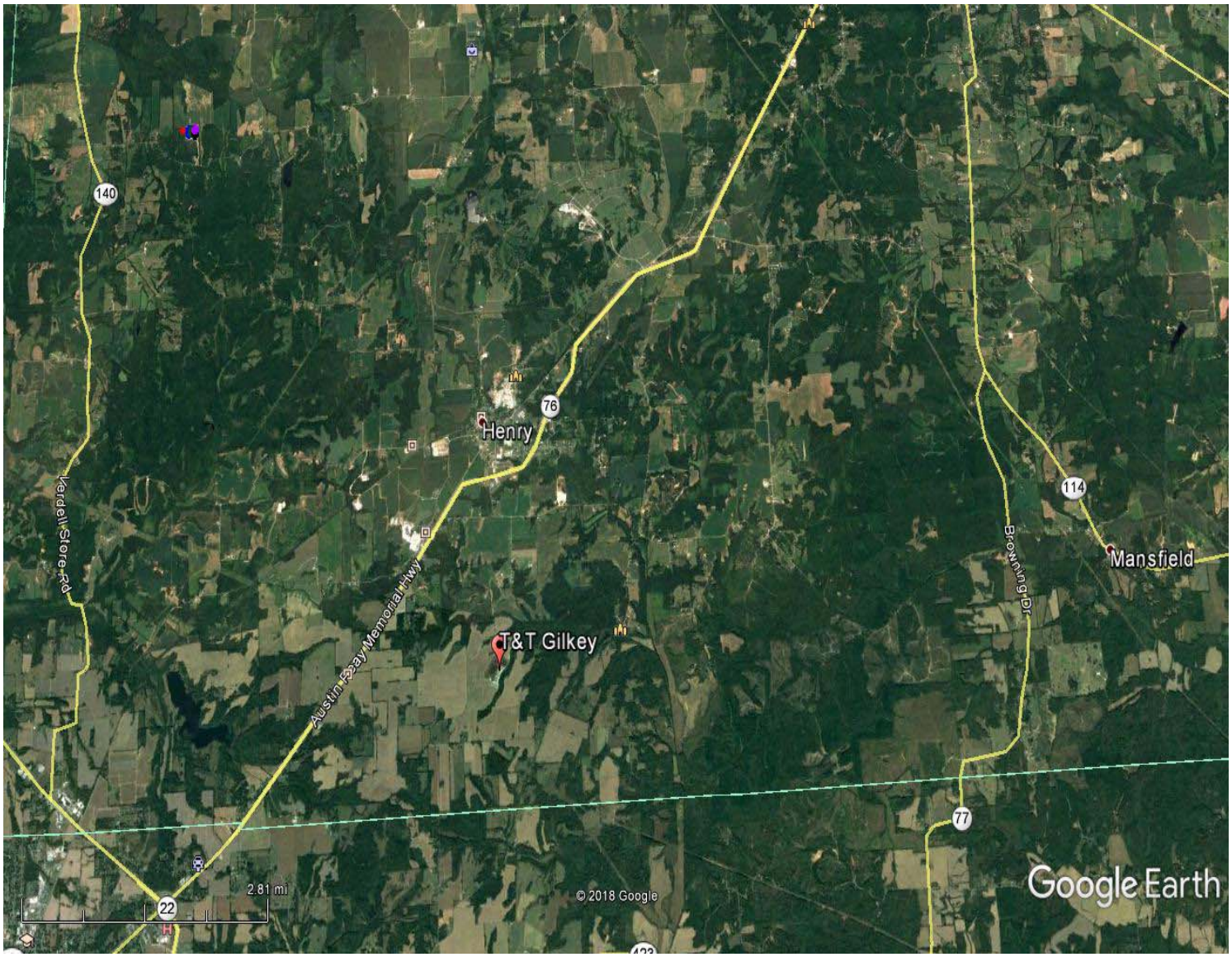
Signature: _____ Date: 2/22/18
Name:

Table of Contents

Section 1. Farmstead (Production Area)

1.1. Maps of Existing and Planned Farmstead Conservation Practices




140
76
Henry
114
Mansfield
Kerdell Store Rd
Austin Stacy Memorial Hwy
Browning Dr
T&T Gilkey
77
22
2.81 mi
© 2018 Google
Google Earth


N
W
E
S

1.2. Farmstead Conservation Practices -- Record of Decisions

Waste Storage Facility (313)

Facility(s)	Planned amount (No.)	Month	Year	Amount Applied	Date
1	17	3	2017	Already applied	
Total	17				

A waste impoundment structure has been constructed, according to NRCS specifications to temporarily store waste such as manure, wastewater, and contaminated runoff as a function of an agricultural waste management system which will protect the environment and public health and safety. Practice lifespan is 15 years. Refer to design drawings and practice standard 313 for additional information.

Composting Facility (317)

Create composting facility to properly dispose of dead hogs. Compost will need to be tested for nutrient levels. See Practice Standard 317.

Field(s)	Planned amount (No.)	Month	Year	Amount Applied	Date
1	1.0	3	2017		
Total	1.0				

All dead pigs must be immediately put in the compost facility and covered with a carbon matter. Suggested carbon matter is sawdust.

Critical Area Planting (342)

Barn(s)	Planned amount (No.)	Month	Year	Amount Applied	Date
Barn	16.0	3	2017	Applied	
Composter	1.0	3	2017	Applied	
Total	17.0	3	2017	Applied	

Critical area planting will be done to stabilize the soil, reduce damage from sediment and runoff to downstream areas, and improve wildlife habitat and visual resources. Adapted vegetation such as trees, shrubs, vines, grasses, or legumes will be established to limit severe erosion or sediment damage. See additional narrative for specific recommendations on seeding rates, dates, fertility requirements, and construction shaping required.

Or

Maintain areas around buildings and composter to ensure clean water is diverted from production areas and erosion is limited.

All NRCS conservation practices shall be installed, operated and maintained according to NRCS conservation practice standards and associated technical specifications.

1.3. Farmstead Conservation Practices – Implementation Requirements

Extension

W255

Disposing of Large Animal Mortalities in Tennessee

Forbes Walker, Associate Professor, and Shawn Hawkins, Assistant Professor
Biosystems Engineering and Soil Science

Animal deaths are a regrettable but sometimes unavoidable part of livestock production. Once an animal dies, it is important to handle and dispose of the carcass in a way that reduces the potential for impacting the health of humans and other livestock and minimizes the impact to the environment, such as pollution of groundwater or surface water. It is recommended that dead animals be disposed of within 48 hours of discovery in a way that follows state guidelines.

In May 2009, the Tennessee Department of Agriculture released its guidelines on handling mortalities in a short policy document entitled "Policy Concerning the Disposal of Dead Farm Animals and The Disposal Offal from Custom Slaughter Facilities." This document can be viewed at the Tennessee Department of Agriculture's website at: http://tn.gov/agriculture/publications/regulatory/animaldisposal.pdf

In Tennessee, dead animal carcasses are defined as a "solid waste," so are regulated by the Tennessee Department of the Environment and Conservation (TDEC), Division of Solid Waste. The disposal of dead animals falls under the solid waste regulations outlined by TDEC at its website: http://www.tennessee.gov/sos/rules/1200/1200-01/1200-01-07.20081126.pdf

The methods that livestock producers in Tennessee can choose to dispose of their dead animals include:

- On-farm burial
- Composting
- Landfilling
- Burning
- Incineration
- Rendering

the center of this base material with the extremities at least 2 feet away from the edge of the base material. Finally, the carcass should be covered with 2 feet of amendment that is mounded to divert rather than capture rainfall. The process will be complete in 3-9 months (only bones are left) and the material can then be land-applied.

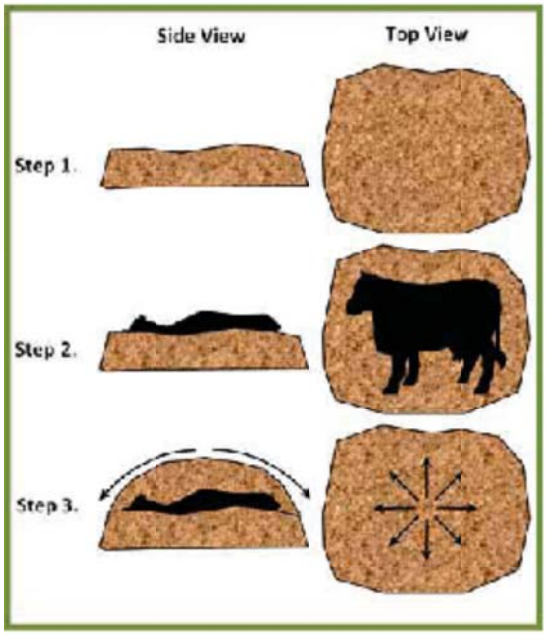


Figure 1. Top and side view schematics illustrating static pile composting of a large animal mortality. Rainfall drainage is illustrated in Step 3.

THE UNIVERSITY of TENNESSEE
INSTITUTE of AGRICULTURE

Visit the UT Extension website at
http://utextension.tennessee.edu

W-251 2/11 11-0123

1.4. Animal Inventory

Animal Group	Type or Production Phase	Number of Animals[a]	Average Weight (lbs)	Confinement Period	Manure Collected (%)[b]	Manure Storage
Pigs	Wean-to-finish pig	16,000	140	Jan Early - Dec Late	100	Lagoon 3

a. The average number of animals present in the production facility at any one time.
b. If manure collected is less than 100%, this indicates that the animals spend a portion of the day outside of the production facility or the production facility is unoccupied one or more times during the confinement period.

1.5. Manure Storage Information

Storage ID	Type of Storage	Pumpable or Spreadable Capacity	Annual Manure Collected	Maximum Days of Storage
Lagoon 1	Lagoon	5,233,008 gal	0 gal	
Lagoon 2	Lagoon	7,456,064 gal	0 gal	
Lagoon 3	Lagoon	14,960,000 gal	14,000,000 gal	390

1.6. Planned Manure Exports

Month-Year	Manure Source	Amount	Receiving Operation	Location

(None)

1.7. Planned Manure Imports

Month-Year	Manure's Animal Type	Amount	Originating Operation	Location

(None)

1.8. Planned Internal Transfers of Manure

Month-Year	Manure Source	Amount	Manure Destination

(None)

1.9. Brief Description of or Additional Information about Animal Feeding Operation (Optional)

T&T Gilkey is owned and operated by James A Tosh. It consists of 16 barns with 16,000 pigs All manure is stored in 3 stage lagoon and is injected to fields Tosh Farms tends on a 2 year P basis in spring or fall. Soil test are taken as required to ensure proper application rate. Tosh Farms owns and maintains all application equipment to prevent accidental spillage. Tosh Pork supplies all feed management. Normal deaths will be composted in a carbon material, like sawdust. The closest stream, 2721 feet away, is Neil Ditch and it flows into Guins Creek.

1.2. Sampling, Calibration and Other Statements

- Manure sampling frequency
  Manure test will be taken each time manure is sold.
- Soil testing frequency
  Soil Test will be taken on a 3 year rotation
- Equipment calibration method and frequency
  Tosh Farms will do yearly calibrations.
- Measures to prevent direct contact of animals with water
  All animals will remain inside above the under floor pit.

1.3. Natural Resource Concerns

If checked, the indicated resource concerns have been identified and have been addressed in this plan.

Soil Quality Concerns

	Soil Quality Concern	*Activities to Address Concern*
	Ephemeral Gully Erosion	
	Gully Erosion	
	Sheet and Rill Erosion	

	Soil Quality Concern	*Activities to Address Concern*
X	Stream/Ditchbank Erosion	Waterways in place to keep gullies from eroding
	Wind Erosion	

Water Quality Concerns

	Water Quality Concern	*Activities to Address Concern*
	Facility Wastewater Runoff	
X	Manure Runoff (Field Application)	All fields in plan
X	Manure Runoff (From Facilities)	All manure stored in pit
	Nutrients in Groundwater	
	Nutrients in Surface Water	
	Silage Leachate	
	Excessive Soil Test Phosphorus	
	Tile-Drained Fields	

Other Concerns Addressed

	Other Concern	*Activities to Address Concern*
	Acres Available for Manure Application	
	Aesthetics	
	Maximize Nutrient Utilization	
	Minimize Nutrient Costs	
X	Neighbor Relations	Setbacks followed
	Profitability	

	Other Concern	*Activities to Address Concern*
	Regulations	
	Soil Compaction	
X	Time Available for Manure Application	Manure will be applied in fall or spring.
	Odors	
X	Air Quality	This facility shouldn't affect air quality
X	Biosecurity	Plan in place.

In Case of an Emergency Storage Facility Spill, Leak or Failure

Implement the following first containment steps:

a. Stop all other activities to address the spill.
b. Stop the flow. For example, use skid loader or tractor with blade to contain or divert spill or leak.
c. Call for help and excavator if needed.
d. Complete the clean-up and repair the necessary components.
e. Assess the extent of the emergency and request additional help if needed.

In Case of an Emergency Spill, Leak or Failure during Transport or Land Application

Implement the following first containment steps:

a. Stop all other activities to address the spill and stop the flow.
b. Call for help if needed.
c. If the spill posed a hazard to local traffic, call for local traffic control assistance and clear the road and roadside of spilled material.
d. Contain the spill or runoff from entering surface waters using straw bales, saw dust, soil or other appropriate materials.
e. If flow is coming from a tile, plug the tile with a tile plug immediately.
f. Assess the extent of the emergency and request additional help if needed.

Emergency Contacts

Department / Agency	Phone Number
Fire	731-642-1413
Rescue services	731-642-5581
State veterinarian	615-837-5183
Sheriff or local police	731-642-1672

Nearest available excavation equipment/supplies for responding to emergency

Equipment Type	Contact Person	Phone Number
Trackhoe	James Tosh	731-243-4861

Contacts to be made by the owner or operator within 24 hours

Organization	Phone Number
EPA Emergency Spill Hotline	1-800-424-8802
County Health Department	731-642-4025
Other State Emergency Agency	1-888-891-8332 TDEC's Water Pollution Control

Be prepared to provide the following information:

a. Your name and contact information.
b. Farm location (driving directions) and other pertinent information.
c. Description of emergency.
d. Estimate of the amounts, area covered, and distance traveled.
e. Whether manure has reached surface waters or major field drains.
f. Whether there is any obvious damage: employee injury, fish kill, or property damage.
g. Current status of containment efforts.

Biosecurity Measures

Biosecurity is critical to protecting livestock and poultry operations. Visitors must contact and check in with the producer before visiting the operation or entering any production or storage facility.

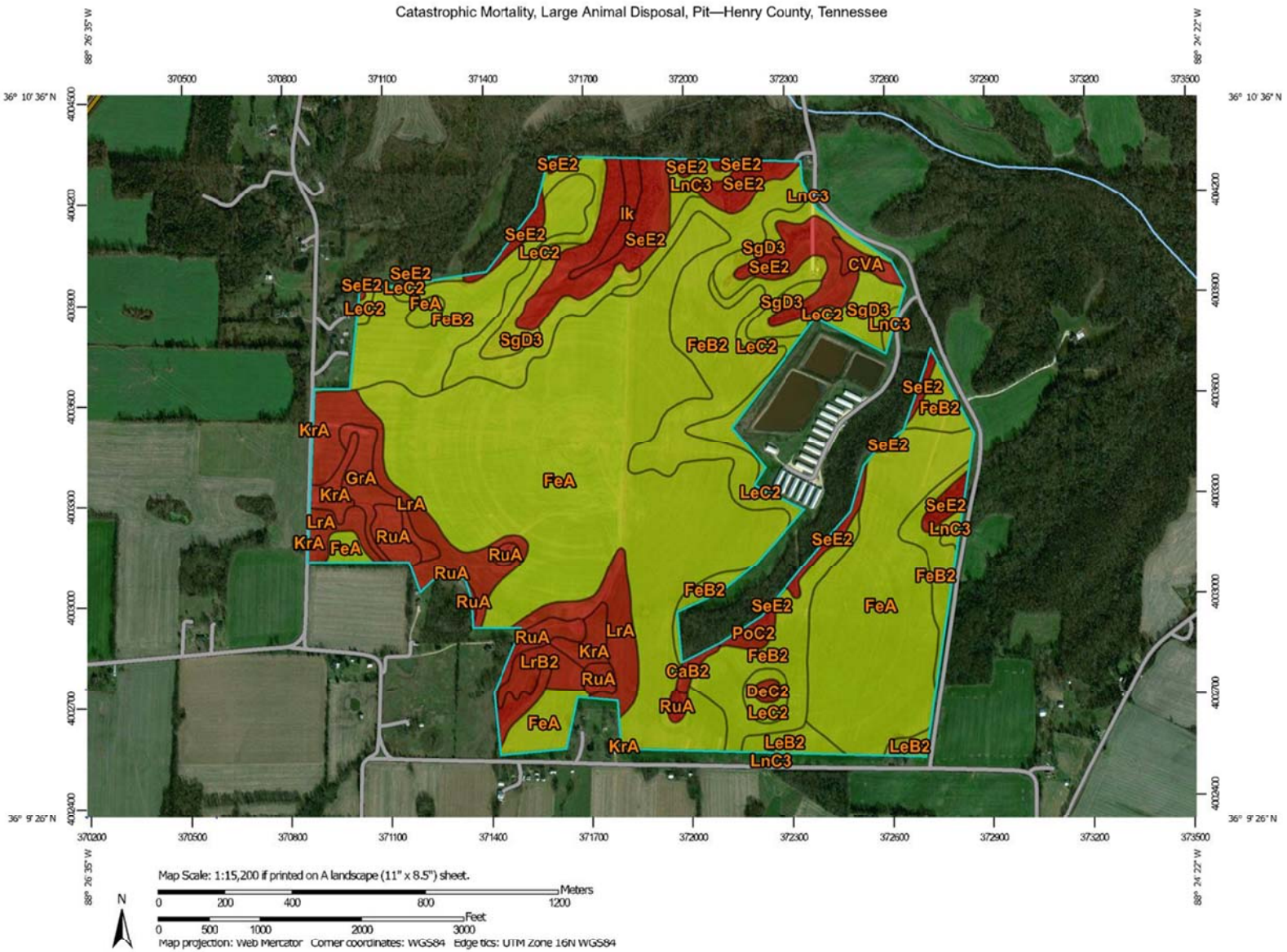
The following narrative describes how animal veterinary wastes (including medical equipment, empty containers, sharps and expired medications) will be managed at the operation.

Medicine will be disposed to as directed on label. Needles and other sharps will be put in to a sharps container. If any medicine is left it shall remain in the control rooms or in a building that is protected from outside environment and stored according to label.

Catastrophic Animal Mortality Management

Refer to NRCS standards, or state guidance, regarding appropriate catastrophic animal mortality handling methods.

Yellow areas are suitable for burial. Another option is Griffin Industries in Union City, Tn.



USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

2/21/2018
Page 1 of 8

Catastrophic Mortality, Large Animal Disposal, Pit

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
CaB2	Calloway silt loam, 2 to 5 percent slopes, eroded	Very limited	Calloway (100%)	Wetness (1.00)	1.5	0.2%
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
CVA	Chenneby, Enville, and Arkabutla soils, 0 to 2 percent slopes, frequently flooded	Very limited	Chenneby (45%)	Flooding (1.00)	2.9	0.5%
				Wetness (1.00)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
			Enville (30%)	Flooding (1.00)		
				Wetness (1.00)		
				Seepage (0.52)		
				Sand content (0.32)		
				Unstable excavation walls (0.15)		
			Arkabutla (20%)	Flooding (1.00)		
				Wetness (1.00)		
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
			Rosebloom (5%)	Flooding (1.00)		
				Wetness (1.00)		
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
DeC2	Deanburg loam, 5 to 8 percent slopes, eroded	Very limited	Deanburg (95%)	Seepage (1.00)	1.2	0.2%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Sand content (0.32)		
				Slope (0.16)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
FeA	Feliciana silt loam, 0 to 2 percent slopes	Somewhat limited	Feliciana (89%)	Dusty (0.05)	269.0	45.7%
				Unstable excavation walls (0.01)		
FeB2	Feliciana silt loam, 2 to 5 percent slopes, eroded	Somewhat limited	Feliciana (92%)	Dusty (0.05)	115.0	19.6%
				Unstable excavation walls (0.01)		
GrA	Grenada silt loam, 0 to 2 percent slopes	Very limited	Grenada (94%)	Wetness (1.00)	8.2	1.4%
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
			Routon (1%)	Wetness (1.00)		
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
Ik	Iuka loam, 0 to 2 percent slopes, occasionally flooded	Very limited	Iuka (89%)	Flooding (1.00)	4.2	0.7%
				Wetness (1.00)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
KrA	Kurk silt loam, 0 to 3 percent slopes	Very limited	Kurk (95%)	Wetness (1.00)	7.4	1.3%
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
			Routon (5%)	Wetness (1.00)		
				Water gathering surface (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
LeB2	Lexington silt loam, 2 to 5 percent slopes, moderately eroded	Somewhat limited	Lexington (94%)	Seepage (0.52)	6.0	1.0%
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
LeC2	Lexington silt loam, 5 to 8 percent slopes, moderately eroded	Somewhat limited	Lexington (95%)	Seepage (0.52)	34.3	5.8%
				Dusty (0.06)		
				Slope (0.04)		
				Unstable excavation walls (0.01)		
LnC3	Lexington silty clay loam, 5 to 8 percent slopes, severely eroded	Somewhat limited	Lexington (95%)	Seepage (0.52)	5.9	1.0%
				Slope (0.16)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
LrA	Loring silt loam, 0 to 2 percent slopes	Very limited	Loring (90%)	Wetness (1.00)	35.9	6.1%
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
LrB2	Loring silt loam, 2 to 5 percent slopes, eroded	Very limited	Loring (95%)	Wetness (1.00)	6.0	1.0%
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
PoC2	Providence silt loam, 5 to 8 percent slopes, moderately eroded	Very limited	Providence (90%)	Wetness (1.00)	2.6	0.4%
				Water gathering surface (0.33)		
				Slope (0.16)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
RuA	Routon silt loam, 0 to 2 percent	Very limited	Routon (100%)	Ponding (1.00)	15.7	2.7%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
	slopes, ponded			Wetness (1.00)		
				Water gathering surface (0.50)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
SeE2	Smithdale loam, 12 to 25 percent slopes, eroded	Very limited	Smithdale (100%)	Slope (1.00)	48.8	8.3%
				Seepage (0.52)		
				Adsorption (0.08)		
				Dusty (0.03)		
				Unstable excavation walls (0.01)		
SgD3	Smithdale-Lexington complex, 8 to 12 percent slopes, severely eroded	Somewhat limited	Smithdale (67%)	Slope (0.96)	23.6	4.0%
				Seepage (0.52)		
				Adsorption (0.08)		
				Dusty (0.02)		
				Unstable excavation walls (0.01)		
			Lexington (33%)	Slope (0.84)		
				Seepage (0.52)		
				Dusty (0.05)		
				Unstable excavation walls (0.01)		
Totals for Area of Interest					**588.3**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Somewhat limited	454.0	77.2%
Very limited	134.3	22.8%
Totals for Area of Interest	**588.3**	**100.0%**

Description

"Catastrophic mortality, large animal disposal, pit," is a method of disposing of dead animals by placing the carcasses in successive layers in an excavated pit. The carcasses are spread, compacted, and covered daily with a thin layer of soil that is excavated from the pit. When the pit is full, a final cover of soil material at least 2 feet thick is placed over the burial pit.

The interpretation is applicable to both heavily populated and sparsely populated areas. While some general observations may be made, onsite evaluation is required before the final site is selected. Improper site selection, design, or installation may cause contamination of ground water, seepage, and contamination of stream systems from surface drainage or floodwater. The risk of contamination can be reduced or eliminated by installing systems designed to eliminate or reduce the adverse effects of limiting soil properties. Ratings are for soils in their present condition. The present land use is not considered in the ratings.

Ratings are based on properties and qualities to the depth normally observed during soil mapping (approximately 6 or 7 feet). However, because pits may be as deep as 15 feet or more, geologic investigations are needed to determine the potential for pollution of ground water and to determine the design needed. These investigations, which are generally arranged by the pit developer, include examination of stratification, rock formations, and geologic conditions that might lead to the conducting of leachates to aquifers, wells, watercourses, and other water sources. The presence of hard, nonrippable bedrock, bedrock crevices, or highly permeable strata at or directly below the proposed pit bottom is undesirable because of the difficulty in excavation and the potential pollution of underground water.

Properties that influence the risk of pollution, ease of excavation, trafficability, and revegetation are major considerations. Soils that are flooded or have a water table within the depth of excavation present a potential pollution hazard and are difficult to excavate. Slope is an important consideration because it affects the work involved in road construction, the performance of the roads, and the control of surface water around the pit. It may also cause difficulty in constructing pits in which the pit bottom must be kept level and oriented to follow the contour of the land.

The ease with which the pit is dug and with which a soil can be used as daily and final cover is based largely on soil texture and consistence, which determine workability when the soil is dry and when it is wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and difficult to place as a uniformly thick cover over a layer of carcasses. The uppermost part of the final cover should be soil material that favors the growth of plants. It should not contain excess sodium or salts and should not be too acid. In comparison with other horizons, the surface layer in most soils has the best workability and the highest content of organic matter. Thus, it may be desirable to stockpile the surface layer for use in the final blanketing of the filled pit area.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected of a properly designed and installed system. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of the individual limitations. The ratings are shown in decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

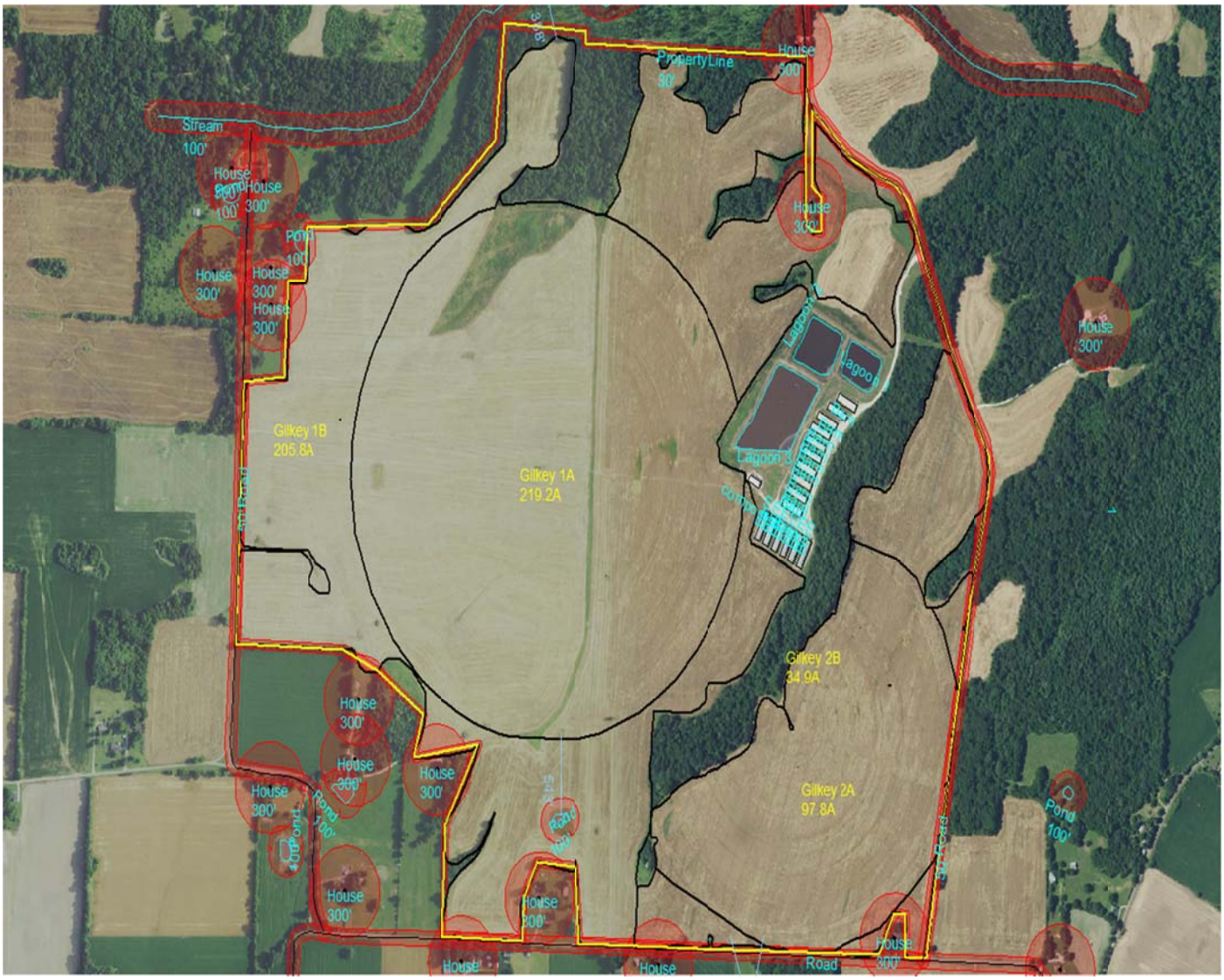
Component Percent Cutoff: None Specified

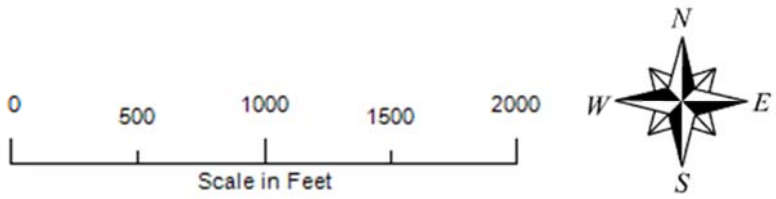
Tie-break Rule: Higher

Section 2. Crop and Pasture (Land Treatment)

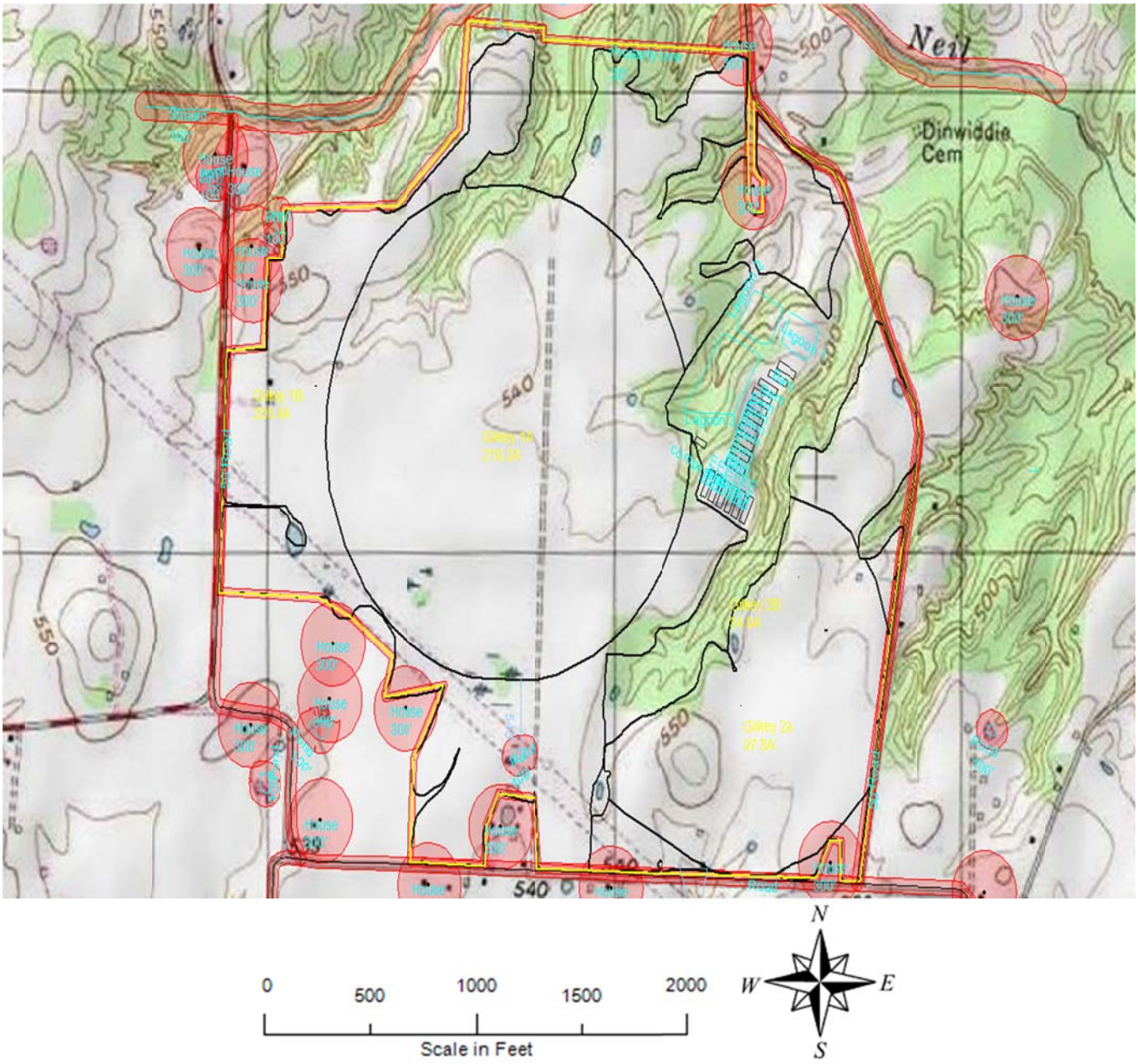
2.1. Maps of Fields, Soils, Application Setbacks, Existing and Planned Crop and Pasture Conservation Practices

Map with Setbacks

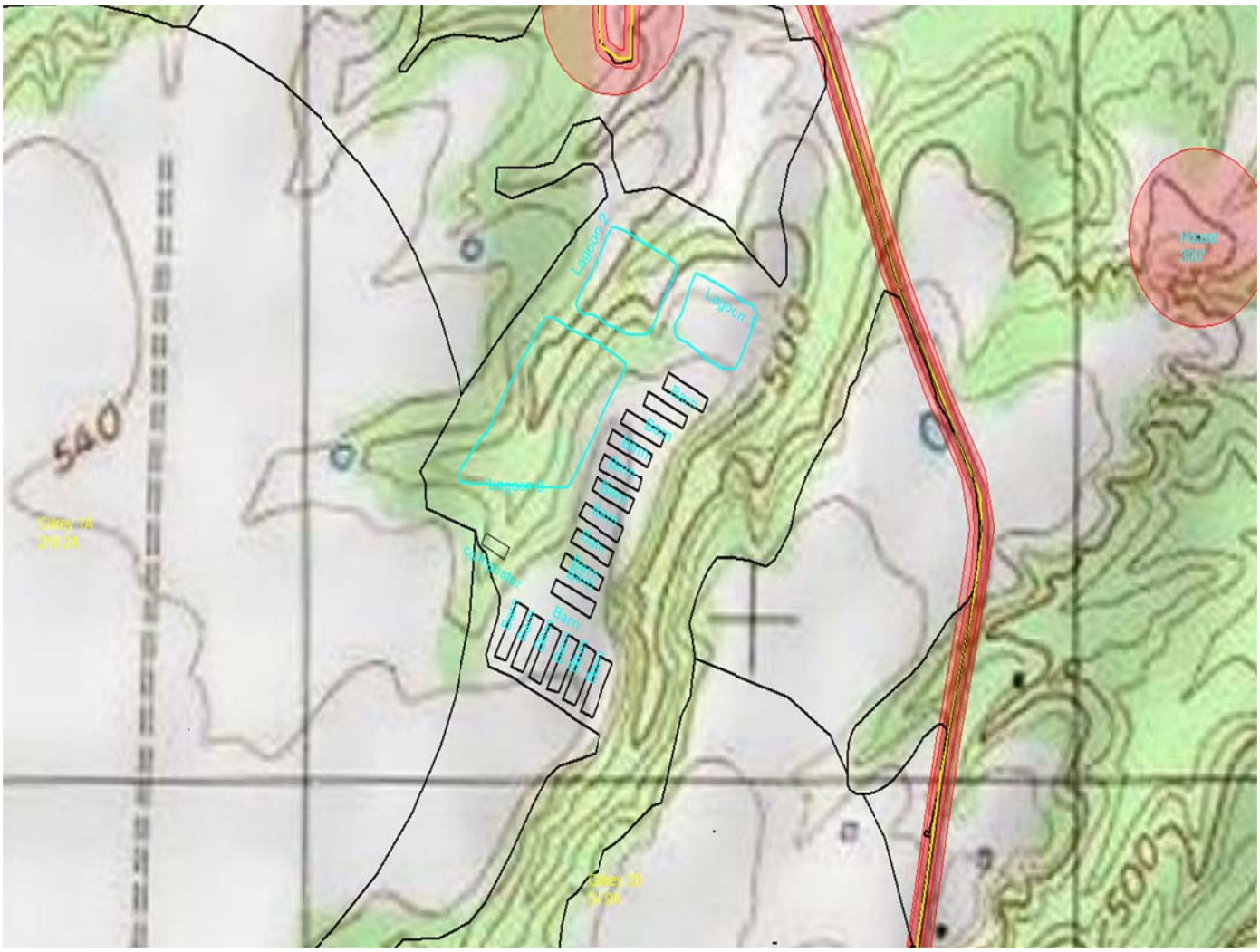




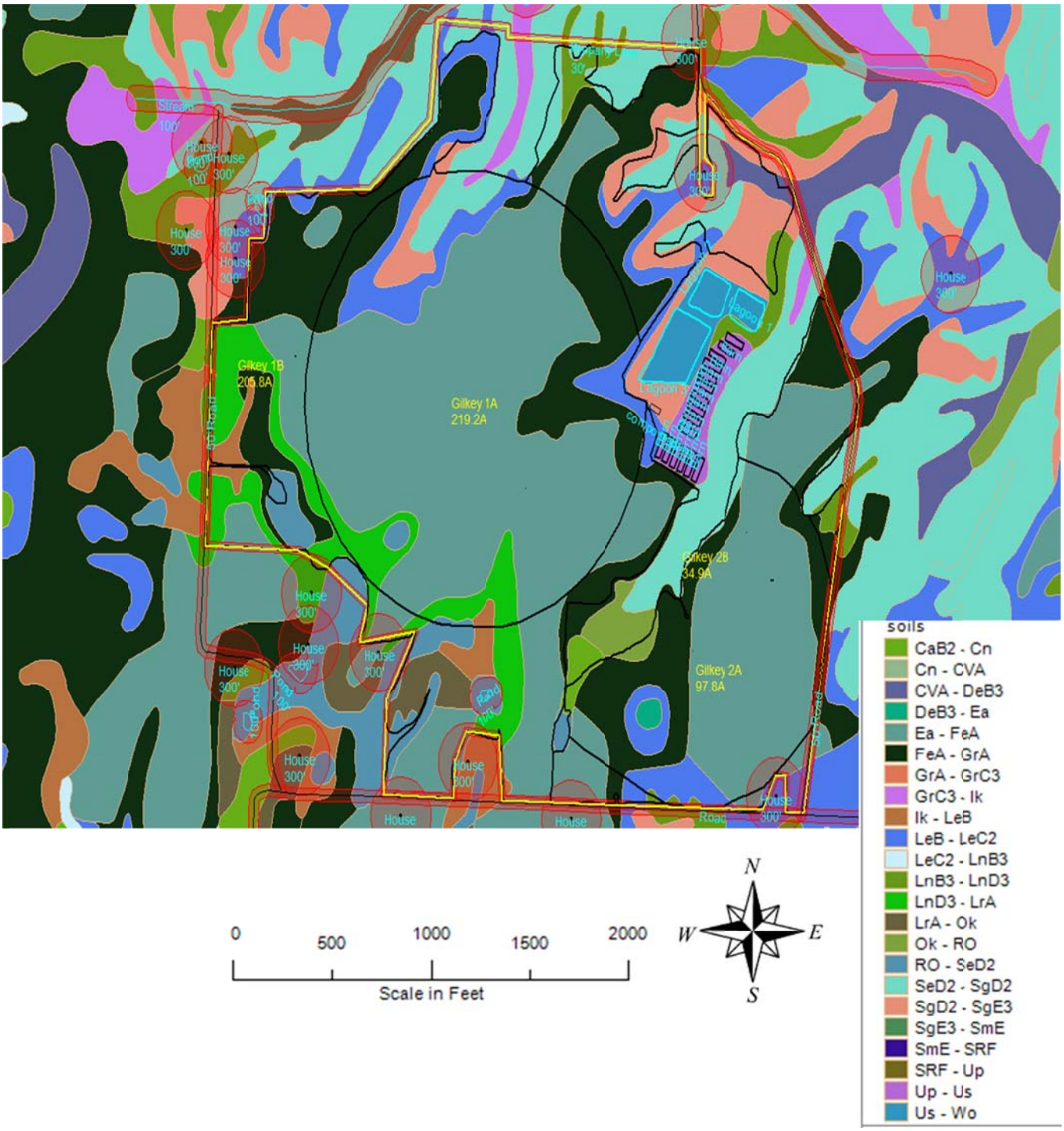
Topo Map


Neil
Dinwiddie Cem
Gilkey 1A 219.3A
Gilkey 1B 205.8A
Gilkey 2A 97.8A
Gilkey 2B 97.8A
Lagoon
Lagoon
540
550
500
House 300'
0
500
1000
1500
2000
Scale in Feet
N
W
E
S

Production Area



Soil Types


Gilkey 1A
219.2A
Gilkey 1B
205.8A
Gilkey 2B
34.9A
Gilkey 2A
97.8A
House
300'
Stream
100'
Pond
100'
Lagoon
soils
CaB2 - Cn
Cn - CVA
CVA - DeB3
DeB3 - Ea
Ea - FeA
FeA - GrA
GrA - GrC3
GrC3 - Ik
Ik - LeB
LeB - LeC2
LeC2 - LnB3
LnB3 - LnD3
LnD3 - LrA
LrA - Ok
Ok - RO
RO - SeD2
SeD2 - SgD2
SgD2 - SgE3
SgE3 - SmE
SmE - SRF
SRF - Up
Up - Us
Us - Wo
0
500
1000
1500
2000
Scale in Feet
N
W
E
S

2.2. Crop and Pasture Conservation Practices -- Record of Decisions

Conservation Crop Rotation (328)

Grow crops in a recurring sequence in the same field. Develop crop rotation program for Corn - Soybeans. See Practice Standard 328.

Field(s)	Planned amount (Ac)	Month	Year	Amount Applied	Date
All Fields in Plan	**546.1**	6	2017		
Total	**546.1**	**6**	**2017**		

Nutrient Management (590)

Soil amendments, animal waste, and lime will be applied according to soil test recommendations. When applying animal waste, recommended buffer widths shall be observed. Refer to Practice Standard 590.

Ongoing: Use of rotation, application of manure and commercial fertilizer/ lime according to soil test results from a Tn accredited lab.

Manure needs to be tested each time an application occurs if manure test varies from this document, make adjustments to application rate.

Field(s)	Planned amount (Ac)	Month	Year	Amount Applied	Date
All Fields in Plan	**546.1**	6	2017		
Total	**564.1**	**6**	**2017**		

All NRCS conservation practices shall be installed, operated and maintained according to NRCS conservation practice standards and associated technical specifications.

2.3. Crop and Pasture Conservation Practices – Implementation Requirements

6˚æ ø℡Æ# ˚ß æ #Ł˘°¸¹#

Divide fields to be sampled into production areas (of 10 acres or less) based on uniform soil type, fertilization and management history. Sandy or eroded areas, and problem areas of obviously different plant growth responses should also be sampled separately -- provided the area is sufficiently large enough to be treated differently with lime or fertilizer.

From your local county Extension office, obtain a soil sample box for **each** production area, and submit a Soil and Media Test Information Sheet,* for each **ten** production areas.

For each production area that you have identified:

1. Collect a composite soil sample by moving through the area in a zig-zag pattern; sampling at a minimum of 20 locations. This sampling procedure should be random with respect to any existing cropping row. In continuous no-till production fields, be sure to vary distance from the row for each sub-sample collected. In continuous no-till fields or where fertilizer has been banded, increasing the number of sub-samples to 30 or 40 will increase precision of the results.

2. Move surface litter aside. Each sub-sample should be obtained by using a soil tube, trowel or spade. For determination of plant nutrients, take soil samples to a depth of 6 inches. For organic matter determination, sample to the depth of 2 inches.

3. Combine each sub-sample in a clean bucket as you move through the production area. Do not use a galvanized bucket if Zn is to be determined. Thoroughly mix the sub-samples into one composite sample. If the soil is exceptionally wet, you may have to let it air dry on a paper plate before it can be properly mixed (wet soil can also dramatically increase shipping costs and weaken shipping containers). DO NOT use heat to dry a soil sample as heat may change your results.

4. From this composite sample remove enough soil (about a cup) to fill a soil sample box. Adequately mark the box to identify the selected production area location represented by that soil sample and keep this record in a safe place for later referral.

5. For the PSNT soil test, sample to a depth of 12 inches when corn is 6 to 12 inches tall. Height should be measured from the ground to bottom of the whorl (4-6 fully mature leaves present).

6. For container media analysis, medium should be sampled before posting by removing several portions from the mix and blending thoroughly. For established plantings, select 8 to 10 pots that are representative of the medium used. Scrape away the top one-fourth inch of each pot including slow-release fertilizer pellets and discard. Mix samples being careful not to crush any remaining fertilizer pellets. Completely fill **two** soil sample boxes for container media analysis.

Send soil sample(s), Soil and Media Information Sheet(s), and appropriate fees to the Soil, Plant and Pest Center (see address and fee information on the Soil and Media Information Sheet). Fees can also be paid by credit card using the secure UT Institute of Agriculture eMarketplace site. Click here to pay online.

THE UNIVERSITY of TENNESSEE Extension
W093

Livestock Waste Management and Conservation

Procedures for Manure and Litter Sampling

(Class I & II – Large and Medium CAFOs)
Tennessee CAFO Factsheet #14

Kristy M. Hill, Extension Dairy Specialist
Animal Science Department

Nutrient composition of manure varies with a number of factors, including animal type, bedding, ration, storage and handling, environmental conditions, field application method, age of manure, timing of sampling and sampling technique. This variability makes book values (or averages) an unreliable source for determining application rates of nitrogen, phosphorus and potassium. Each livestock production operation and manure management system is unique, and an individual farm's manure analysis can vary from average values by 50 percent or more. Testing manure may better indicate how animal management and other factors actually affect nutrient contents and will allow for more accurate calculation of application rates.

The results of a manure analysis are only as reliable as the sample taken. A representative sample is needed to accurately reflect the nutrient content. However, obtaining a representative sample can be a challenge as manure nutrient content is not uniform within storage structures. Mixing and sampling strategies can insure that samples more accurately reflect the type of manure that will be applied.

When to Sample

The ideal time to sample manure is prior to application to ensure that results of the analysis are received in time to adjust nutrient application rates.

However, do not allow long periods of time to pass before application begins, because there can be storage and handling losses over time. Sampling several days to a week prior to application is best. However, a complication of the timing of the sampling is that semi-solid (or slurry) manure should be well agitated before sampling, and in many situations, such as contracting waste application to a third party, agitators or other necessary equipment are not available until application begins. In cases such as this, "pre-sampling" (dipping samples off the top of the storage structure for N and K concentrations) can be used to estimate application rates (See page 4 for more info on pre-sampling).

Building a "bank" of manure analysis over time can be quite useful in the future as long as animal management practices, feed rations or manure storage and handling methods do not drastically change from present methods. If samples do not vary greatly from year to year or are consistent during spring or fall applications, the "bank" averages will help estimate application rates if an analysis cannot be performed prior to application.

Safety Precautions

It is more dangerous and more difficult to sample from liquid storage facilities than dry-manure systems. Proper precautions should be taken to prevent

accidents, such as falling into the storage facility or being overcome by manure gases.

1. Have two people present at all times;
2. Never enter confined manure-storage spaces without appropriate safety gear, such as a self-contained breathing apparatus;
3. When agitating a storage pit below a building, be sure to provide adequate ventilation for both humans and animals; and
4. When agitating outdoor pits, monitor activities closely to prevent erosion of berms or destruction of pit liners.

Sample Preparations

1. Check with the laboratory performing the analysis, as most of these labs have plastic bottles available for liquid sample collection or sealable plastic bags for dry samples (freezer bags work well). Additionally, they may have specific sample collection procedures, including holding times, refrigeration and shipping requirements.
2. Do not use glass containers, as expansion of the gases in the sample can cause the container to break.
3. Never use galvanized containers for collection or mixing due to the risk of contamination from metals like zinc in the container.
4. When taking liquid samples from facilities spreading both effluent and solids, the manure should be agitated for two to four hours before taking the sample.
5. Liquid samples can be taken during agitation (after two to four hours have passed) because most agitation equipment is effective 75 to 100 feet away from the equipment.
6. Take multiple samples from the storage facility and mix them together thoroughly in a larger bucket to obtain a representative sample. For liquid or semi-solid samples, use a stirring rod to get the solids spinning in suspension and collect the representative sample while the liquid is still spinning.
7. When taking liquid samples, fill the plastic bottle three-fourths full and leave at least 1 inch of air space to allow for gas expansion.
8. When taking dry samples, squeeze all of the excess air from the sealable plastic bag to allow for gas expansion and place the first bag into a second sealable plastic bag to prevent leaks.
9. Label the plastic bags or bottles prior to sampling with your name, date and sample identification number. Use a waterproof pen.
10. After sampling, place the container(s) in the refrigerator or freezer (preferred) until mailed to the lab. Cooling the samples will reduce microbial activity, chemical reactions and reduce odors.
11. Ship samples early in the week (Monday–Wednesday) using an overnight service. Avoid holidays and weekends.

Sampling Semi-Solid and Liquid Manure from Storage Facilities

Manure with 10 to 20 percent solids is classified as semi-solid manure and can usually be handled as a liquid. Semi-solid manure usually requires the use of chopper pumps to provide thorough agitation before pumping. Liquid manure is manure with less than 10 percent solids and is handled with pumps, pipes, tank wagons or irrigation equipment (if less than 5 percent solids).

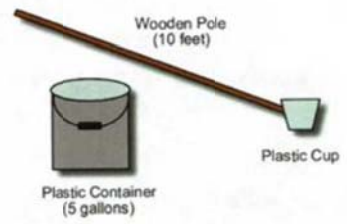
If all contents of the entire semi-solid or liquid storage facility will be applied, complete agitation (2-4 hours minimum) is required to accurately sample the manure because in liquid and semi-solid systems, settled solids can contain more than 90 percent of the phosphorus. However, if solids will be purposefully left on the bottom when the storage structure is pumped out, as is sometimes the case with lagoons, then complete agitation during sampling will generate artificially high nutrient values. In this case, agitation of the solids or sludge at the bottom of the lagoon is not needed for nutrient analysis, and premixing the surface liquid in the lagoon is not needed.

Methods of Sampling:

Several different methods may be used to sample liquid or semi-solid manure from storage facilities:

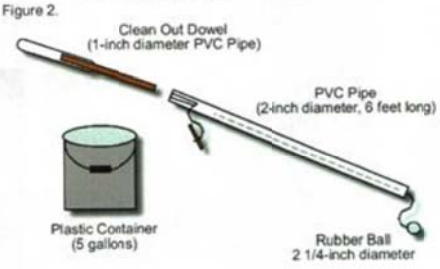
1. Use a plastic sampling cup with a 10- to 12-foot handle to obtain surface water samples (see Figure 1). Collect about a pint of sample from several locations (six to eight) around the perimeter of the storage unit about 6 feet from the bank and 12 inches below the surface. Avoid floating debris or scum. Pour each of the samples into a clean plastic bucket and mix well. Pour representative sample in plastic container for shipping. *(Chastain, 2003)*

Figure 1.



2. Throw a small plastic bucket tied to a long rope out towards the middle of the storage unit while holding onto the rope. Begin pulling the bucket back to the bank as soon as it strikes the surface. Make sure the bucket is raised above the surface before it strikes the bank. Pour each sample into a larger plastic bucket, and repeat this procedure at four to six locations evenly spaced around the perimeter of the storage unit. Mix all samples well and pour representative sample into a plastic container for shipping. *(Chastain, 2003)*
3. Samples may also be taken using a probe or a tube. They can be constructed out of a 1½-inch diameter PVC pipe. Cut the PVC pipe a foot longer than the depth of the pit. Run a ¼-inch rod or string through the length of the pipe and attach a plug such as a rubber stopper or rubber ball (see Figure 2). The rod or the string must be longer than the pipe. If using a rod, bend the top over to prevent it from falling out of the pipe. The probe should be slowly inserted into the pit or lagoon with the stopper open, to the full depth of the pit. Pull the string or rod to close the bottom of the pipe and pull the probe out of the pit, being careful not to tip the pipe and dump the sample. Release the sample into a large plastic bucket and repeat the process at least three times around the pit. Mix all samples well and pour a representative sample into a plastic container for shipping. *(Rieck-Hinz, 2003)*

Figure 2.



Sampling Semi-Solid and Liquid Manure during Land Application with Tank Wagons

Settling begins as soon as agitation stops, so samples should be collected as soon as possible after the manure tank wagon is filled, unless the tanker has an agitator. Be sure the port or opening does not have a solids accumulation from prior loads. Collect samples in a plastic bucket from the loading or unloading port or the opening near the bottom of the tank. Stir the sample in the bucket to get the solids in suspension. Remove a ladle full while the liquid is still spinning and pour into the sample bottle. Repeat these steps until the sample bottle is three quarters full.

Sampling Liquid Manure during Land Application with Irrigation Systems

Place plastic buckets randomly at different distances from the sprinkler head in the field to collect the liquid manure that is being applied by an irrigation system. Immediately after manure has been applied, collect manure from the buckets and combine them into one container. Stir the collective sample, remove a ladle full while the liquid is still spinning and pour into the sample bottle.

Pre-Sampling Nitrogen and Potassium from Liquid Manure Systems

If liquid systems cannot be agitated prior to application and a sample is needed to estimate application rates, manure samples can be dipped off the top of the stored liquid manure to analyze for N and K concentrations. Research indicates that the top-dipped liquid represents approximately 90 percent of the N concentration measured in mixed, field-collected samples. Multiply the results of the N concentration from top-dipped samples by 1.1 for a better estimate of N. Dipping a sample from the surface of a liquid storage pit does NOT provide a good estimate of P concentrations in the pit, so use of the P analysis from top-dipped samples is not recommended. Therefore, if application is limited to a P-based application rate, pre-sampling is not recommended. Producers who take these types of samples should remember to take additional samples during application to calculate the actual amount of nutrients applied and use to adjust commercial fertilizer application. *(Rieck-Hinz, 2003)*

Sampling Dry or Solid Manure

Solid manure systems will include fecal matter, urine, bedding and feed. They can vary from one location to another within the same production operation and from season to season. Sampling of dry or solid manure is best done in the field during application, because it will take into account losses that occur during handling and application. Manure is better mixed during application than during storage. Results will not be available in time to adjust application rates; however, sampling will allow producers to adjust any future commercial fertilizer rates and manure application in subsequent years. If a sample must be taken prior to application to estimate application rates, be sure to take samples from various places in the manure pile, stack or litter to obtain a representative sample for analysis. It may even be beneficial to take samples several times during the year because of the variation in bedding content.

Methods of Sampling:

As with liquid or semi-solid systems, many different methods can be used to obtain a representative sample. The method chosen will depend on the type of solid system used on the farm. Sub-samples can be taken with a shovel, pitchfork or soil probe. Regardless of the method of sampling, a composite

sample will need to be taken from all of the samples to ensure it represents the entire manure used for application. To obtain a composite sample, place all sub-samples (the more sub-samples, the more accurate the results) in a pile and mix with a shovel by continuously scooping from the outside of the pile to the center of the pile until well mixed. Fill a one-gallon plastic Zip-lock® freezer bag (or the bag provided by the laboratory) one-half full with the composite sample by turning the bag inside out over one hand. With the covered hand, grab representative handfuls of manure and turn the freezer bag right side out over the sample with the free hand. Squeeze out the excess air, close, seal and store sample in another plastic sealable bag in the freezer until mailed. *(Rieck-Hinz, 2003)*

1. *Sampling poultry litter in-house:* Collect 10 to 15 sub-samples from throughout the house to the depth the litter will be removed. Cake litter samples should be taken at the depth of cake removal. The number of samples taken near feeders or waterers should be proportionate to their space occupied in the whole house. *(LPES)*
2. *Sampling stockpiled manure, litter or compost:* Ideally, stockpiled material should be stored under cover on an impervious surface. The exterior of uncovered waste may not accurately represent the majority of the material because rainfall moves water-soluble nutrients down into the pile. If an uncovered stockpile is used over an extended period of time, it should be sampled before each application. Take 10 sub-samples from different locations around the pile at least 18 inches below the surface. *(LPES)*
3. *Sampling from a bedded pack:* It is recommended that samples from a bedded pack be taken during loading. Take at least five sub-samples while loading several spreader loads. *(Peters, 2003)*
4. *Sampling daily hauls:* Place a five-gallon pail under the barn cleaner 4 to 5 times while loading a spreader. *(Peters, 2003)*
5. *Sampling scrape-and-haul feedlots:* Facilities where manure accumulates on paved feedlots and is scraped and hauled to the field daily or several times during the week are referred to as scrape-and-haul feedlots. Sub-samples can be collected by scraping a shovel across approximately 25 feet of the paved feedlot. This process should be repeated 10 or more times, taking care to sample in a direction that slices through the variations of moisture, bedding, depth, age, etc. Avoid excessively wet areas and areas with large amounts of hay or feed. Several composite samples may be needed for this type of facility. *(Rieck-Hinz, 2003)*
6. *Sampling during spreading or land application:* Spread a sheet of plastic or a tarp in the field and drive the tractor and spreader over the top of the plastic to catch the manure from one pass of the spreader. Samples should be collected to represent the first, middle and last part of the storage facility or loads applied and should be correlated as to which loads are applied on each field to track changes in nutrient content throughout the storage facility. *(Rieck-Hinz, 2003)*

References

Peters, John. (ed.) 2003. **Recommended Methods of Manure Analysis**. University of Wisconsin Extension. A3769.

Rieck-Hinz, A., J. Lorimor, T. Richard, and K. Kohl. 2003. **How to Sample Manure for Nutrient Analysis**. Iowa State University Extension. PM1558.

Chastain, J.P. 2003. **Manure Sampling Procedures.** South Carolina Confined Animal Manure Managers Certification Program. Clemson Extension.

Livestock and Poultry Environmental Stewardship (LPES) Curriculum. Manure Sampling. Module D, Land Application and Nutrient Management.

2.4. Predicted Soil Erosion

Average water, wind, irrigation, gully and ephemeral erosion estimates

Field	Predominant Soil Type	T Factor (t/ac/yr)	Slope (%)	Water (Sheet and Rill) (t/ac/yr)	Wind (t/ac/yr)	Irrigation Erosion Controlled (y/n)	Gully Erosion Controlled (y/n)	Ephemeral Erosion Controlled (y/n)
Gilkey 1A	FeA (Feliciana SIL)	5	1.0	0.2				
Gilkey 1B	FeB2 (Feliciana SIL)	5	3.5	2.0				
Gilkey 2A	FeA (Feliciana SIL)	5	1.0	0.2				
Gilkey 2B	FeA (Feliciana SIL)	5	1.0	0.9				

Crop period sheet and rill erosion estimates

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss (t/ac)
Gilkey 1A	2018	Soybean	9/16/2017	10/15/2018	0.1
	2019	Corn grain	10/16/2018	9/15/2019	0.2
	2020	Corn grain	9/16/2019	9/15/2020	0.2
	2021	Soybean	9/16/2020	10/15/2021	0.1
	2022	Corn grain	10/16/2021	9/15/2022	0.2
Gilkey 1B	2018	Soybean	9/16/2017	10/15/2018	1.4
	2019	Corn grain	10/16/2018	9/15/2019	2.3
	2020	Soybean	9/16/2019	10/15/2020	2.0
	2021	Corn grain	10/16/2020	9/15/2021	2.3
	2022	Soybean	9/16/2021	10/15/2022	2.0
Gilkey 2A	2018	Soybean	9/16/2017	10/15/2018	0.1
	2019	Corn grain	10/16/2018	9/15/2019	0.2
	2020	Corn grain	9/16/2019	9/15/2020	0.2
	2021	Soybean	9/16/2020	10/15/2021	0.1
	2022	Corn grain	10/16/2021	9/15/2022	0.2
Gilkey 2B	2018	Soybean	9/16/2017	10/15/2018	0.7
	2019	Corn grain	10/16/2018	9/15/2019	0.9
	2020	Soybean	9/16/2019	10/15/2020	0.9

Field	Crop Year	Primary Crop	Starting Date (mm/dd/yyyy)	Ending Date (mm/dd/yyyy)	Crop Period Soil Loss (t/ac)
	2021	Corn grain	10/16/2020	9/15/2021	1.0
	2022	Soybean	9/16/2021	10/15/2022	0.9

Section 3. Nutrient Management Plan (590)

3.1. Nitrogen and Phosphorus Risk Analyses

Tennessee Phosphorus Index

Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Gilkey 1A	2018	11	16	11	176	Medium
Gilkey 1A	2019	11	20	11	220	Medium
Gilkey 1A	2020	11	20	11	220	Medium
Gilkey 1A	2021	11	14	11	154	Medium
Gilkey 1A	2022	11	20	11	220	Medium
Gilkey 1B	2018	11	6	11	66	Low
Gilkey 1B	2019	11	14	11	154	Medium
Gilkey 1B	2020	11	7	11	77	Low
Gilkey 1B	2021	12	11	12	132	Low
Gilkey 1B	2022	11	6	11	66	Low
Gilkey 2A	2018	11	16	11	176	Medium
Gilkey 2A	2019	11	18	11	198	Medium
Gilkey 2A	2020	11	17	11	187	Medium
Gilkey 2A	2021	11	15	11	165	Medium
Gilkey 2A	2022	11	20	11	220	Medium
Gilkey 2B	2018	11	6	11	66	Low
Gilkey 2B	2019	11	11	11	121	Low
Gilkey 2B	2020	11	7	11	77	Low
Gilkey 2B	2021	11	3	11	33	Low
Gilkey 2B	2022	11	6	11	66	Low

3.2. Manure Application Setback Distances

Setback Requirements: Class I CAFO

Feature	Setback Criteria	Setback Distance (Feet)
Streams	Applied upgradient, no permanent or insufficient vegetated setback	100
Streams	New operation, near high quality stream	60
Surface waters	Applied upgradient, no permanent or insufficient vegetated setback	100
Open tile line inlet structures	Applied upgradient, no permanent or insufficient vegetated setback	100
Sinkholes	Applied upgradient, no permanent or insufficient vegetated setback	100
Agricultural well heads	Applied upgradient, no permanent or insufficient vegetated setback	100
Other conduits to surface waters	Applied upgradient, no permanent or insufficient vegetated setback	100
Potable well, public or private	Application down-gradient of feature	150
Potable well, public or private	Application upgradient of feature	300

Source: TN DEQ Rule 1200-4-5-.14(17)(d) (http://www.state.tn.us/sos/rules/1200/1200-04/1200-04-05.pdf)

Setback Requirements: NRCS Standard

Feature	Setback Criteria	Setback Distance (Feet)
Well	Application upgradient of feature	300
Well	Application down-gradient of feature	150
Waterbody	Predominant slope <5% with good vegetation	30

Feature	Setback Criteria	Setback Distance (Feet)
Waterbody	Poor vegetation	100
Public road	All applications	50
Dwelling (other than producer)	All applications	300
Public use area	All applications	300
Property line	Application upgradient of feature	30

Source: Nutrient Management Standard 590 (http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc)

3.3. Soil Test Data

Field	Test Year	OM (%)	P Test Used	P	K	Mg	Ca	Units	Soil pH	Buffer pH	CEC (meq/ 100g)
Gilkey 1A	2017		Mehlich-1	11	119			lbs/ac			
Gilkey 1B	2017		Mehlich-1	11	191			lbs/ac			
Gilkey 2A	2017		Mehlich-1	26	118			lbs/ac			
Gilkey 2B	2017		Mehlich-1	14	228			lbs/ac			

3.4. Manure Nutrient Analyses

Manure Source	Dry Matter (%)	Total N	NH_4-N	Total P_2O_5	Total K_2O	Avail. P_2O_5	Avail. K_2O	Units	Analysis Source and Date	Alum Treatment Rate (lbs/1000 sq.ft.)
Lagoon 1		6.7	3.8	2.4	5.0	2.4	5.0	lbs/1000 gal	11-22-2016 Tosh Farms	
Lagoon 2		4.0		2.0	5.0	2.0	5.0	lbs/1000 gal	11-22-2016 Tosh Farms	
Lagoon 3		6.7	3.8	2.4	5.0	2.4	5.0	lbs/1000 gal	11-22-2016 Tosh Farms	

a. Entered analysis may be the average of several individual analyses.

b. Tennessee assumes that 100% of manure phosphorus and 100% of manure potassium is crop available. First-year per-acre nitrogen availability for individual manure applications is given in the Planned Nutrient Applications table. For more information about nitrogen availability in Tennessee, see "Manure Application Management," Tables 3 and 4, Tennessee Extension, PB1510, 2/94 (http://wastemgmt.ag.utk.edu/Pubs/PB1510.pdf).

3.5. Planned Crops and Fertilizer Recommendations

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P_2O_5 Rec (lbs/ac)	K_2O Rec (lbs/ac)	N Removed (lbs/ac)	P_2O_5 Removed (lbs/ac)	K_2O Removed (lbs/ac)	Custom Fert. Rec. Source
Gilkey 1A	2018	Small grain[a]	70.0 bu	90	80	20	91	35	25	
Gilkey 1A	2018	Soybean	50.0 bu	0	10	40	200	40	70	
Gilkey 1A	2019	Corn grain	220.0 bu	220	180	90	165	97	64	
Gilkey 1A	2020	Corn grain	220.0 bu	240	180	90	165	97	64	
Gilkey 1A	2021	Small grain[a]	70.0 bu	90	80	20	91	35	25	
Gilkey 1A	2021	Soybean	50.0 bu	0	10	40	200	40	70	
Gilkey 1A	2022	Corn grain	220.0 bu	220	180	90	165	97	64	
Gilkey 1B	2018	Small grain[a]	70.0 bu	75	80	0	91	35	25	
Gilkey 1B	2018	Soybean	50.0 bu	0	10	0	200	40	70	
Gilkey 1B	2019	Corn grain	200.0 bu	190	160	0	150	88	58	
Gilkey 1B	2020	Small grain[a]	70.0 bu	90	80	0	91	35	25	
Gilkey 1B	2020	Soybean	50.0 bu	0	10	0	200	40	70	
Gilkey 1B	2021	Corn grain	200.0 bu	190	160	0	150	88	58	
Gilkey 1B	2022	Small grain[a]	70.0 bu	90	80	0	91	35	25	
Gilkey 1B	2022	Soybean	50.0 bu	0	10	0	200	40	70	
Gilkey 2A	2018	Small grain[a]	70.0 bu	90	40	20	91	35	25	
Gilkey 2A	2018	Soybean	50.0 bu	0	20	40	200	40	70	
Gilkey 2A	2019	Corn grain	220.0 bu	220	90	90	165	97	64	
Gilkey 2A	2020	Corn grain	220.0 bu	240	90	90	165	97	64	
Gilkey 2A	2021	Small grain[a]	70.0 bu	90	40	20	91	35	25	
Gilkey 2A	2021	Soybean	50.0 bu	0	20	40	200	40	70	
Gilkey 2A	2022	Corn grain	220.0 bu	220	90	90	165	97	64	
Gilkey 2B	2018	Small grain[a]	70.0 bu	75	80	0	91	35	25	
Gilkey 2B	2018	Soybean	50.0 bu	0	10	0	200	40	70	
Gilkey 2B	2019	Corn grain	200.0 bu	190	160	0	150	88	58	
Gilkey 2B	2020	Small grain[a]	70.0 bu	90	80	0	91	35	25	
Gilkey 2B	2020	Soybean	50.0 bu	0	10	0	200	40	70	
Gilkey 2B	2021	Corn grain	200.0 bu	190	160	0	150	88	58	
Gilkey 2B	2022	Small grain[a]	70.0 bu	90	80	0	91	35	25	

Field	Crop Year	Planned Crop	Yield Goal (per ac)	N Rec (lbs/ac)	P_2O_5 Rec (lbs/ac)	K_2O Rec (lbs/ac)	N Removed (lbs/ac)	P_2O_5 Removed (lbs/ac)	K_2O Removed (lbs/ac)	Custom Fert. Rec. Source
Gilkey 2B	2022	Soybean	50.0 bu	0	10	0	200	40	70	

a. Unharvested cover crop or first crop in double-crop system.
b. Custom fertilizer recommendation.

3.6. Planned Nutrient Applications (Manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Gilkey 1A	Mar 2018	Small grain	Lagoon 3	Gilkey 1 Pivot	1-yr P	27,200 gal	4703 min	5,644,000 gal	207.5	90	65	136
Gilkey 1A	Apr 2019	Corn grain	32-0-0	Surface broadcast	1-yr N	13 gal		2,698 gal	207.5	46	0	0
Gilkey 1A	Jun 2019	Corn grain	Lagoon 3	Gilkey 1 Pivot	1-yr P	40,500 gal	7003 min	8,403,750 gal	207.5	134	97	203
Gilkey 1A	Apr 2020	Corn grain	32-0-0	Surface broadcast	1-yr N	16 gal		3,320 gal	207.5	57	0	0
Gilkey 1A	Jun 2020	Corn grain	Lagoon 3	Gilkey 1 Pivot	1-yr P	40,500 gal	7003 min	8,403,750 gal	207.5	134	97	203
Gilkey 1A	Apr 2021	Soybean	Lagoon 3	Gilkey 1 Pivot	1-yr P	17,500 gal	3026 min	3,631,250 gal	207.5	58	42	88
Gilkey 1A	Apr 2022	Corn grain	32-0-0	Surface broadcast	1-yr N	13 gal		2,698 gal	207.5	46	0	0
Gilkey 1A	Jun 2022	Corn grain	Lagoon 3	Gilkey 1 Pivot	Custom	40,000 gal	6917 min	8,300,000 gal	207.5	132	96	200
Gilkey 1B	Mar 2018	Small grain	Lagoon 3	Tosh Drag line	1-yr P	13,200 gal	1.1 mph	2,469,720 gal	187.1	75	32	66
Gilkey 1B	Feb 2019	Corn grain	Lagoon 3	Tosh Drag line	1-yr P	32,400 gal	0.5 mph	6,062,040 gal	187.1	185	78	162
Gilkey 1B	Oct 2019	Small grain	Lagoon 3	Tosh Drag line	1-yr P	13,500 gal	1.1 mph	2,525,850 gal	187.1	77	32	68
Gilkey 1B	Apr 2021	Corn grain	Lagoon 3	Tosh Drag line	1-yr P	31,900 gal	0.5 mph	5,968,490 gal	187.1	182	77	160
Gilkey 1B	Nov 2021	Small grain	Lagoon 3	Tosh Drag line	1-yr P	13,300 gal	1.1 mph	2,488,430 gal	187.1	76	32	67
Gilkey 2A	Mar 2018	Small grain	Lagoon 3	Gilkey 2 Pivot	1-yr P	27,200 gal	2158 min	2,589,440 gal	95.2	90	65	136
Gilkey 2A	Apr 2019	Corn grain	32-0-0	Surface broadcast	1-yr N	29 gal		2,761 gal	95.2	102	0	0
Gilkey 2A	Jun 2019	Corn grain	Lagoon 3	Gilkey 2 Pivot	1-yr P	40,500 gal	2542 min	3,050,390 gal	75.3	134	97	203
Gilkey 2A	Apr 2020	Corn grain	32-0-0	Surface broadcast	1-yr N	35 gal		3,332 gal	95.2	124	0	0
Gilkey 2A	Jun 2020	Corn grain	Lagoon 3	Gilkey 2 Pivot	1-yr P	40,500 gal	2243 min	2,691,450 gal	66.5	134	97	203
Gilkey 2A	Apr 2021	Soybean	Lagoon 3	Gilkey 2 Pivot	1-yr P	21,200 gal	1682 min	2,018,240 gal	95.2	70	51	106
Gilkey 2A	Apr 2022	Corn grain	32-0-0	Surface broadcast	1-yr N	22 gal		2,094 gal	95.2	78	0	0
Gilkey 2A	Jun 2022	Corn grain	Lagoon 3	Gilkey 2 Pivot	1-yr P	40,500 gal	3213 min	3,855,600 gal	95.2	134	97	203
Gilkey 2B	Mar 2018	Small grain	Lagoon 3	Tosh Drag line	1-yr P	13,200 gal	1.1 mph	370,920 gal	28.1	75	32	66
Gilkey 2B	Apr 2019	Corn grain	Lagoon 3	Tosh Drag line	1-yr P	32,400 gal	0.5 mph	910,440 gal	28.1	185	78	162

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Loads, Speed or Time	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Gilkey 2B	Oct 2019	Small grain	Lagoon 3	Tosh Drag line	1-yr P	13,500 gal	1.1 mph	379,350 gal	28.1	77	32	68
Gilkey 2B	Apr 2021	Corn grain	Lagoon 3	Tosh Drag line	1-yr P	31,900 gal	0.5 mph	49,022 gal	1.5	182	77	160
Gilkey 2B	Apr 2021	Corn grain	32-0-0	Surface broadcast	Supp. N	32 gal		899 gal	28.1	113	0	0
Gilkey 2B	Nov 2021	Small grain	Lagoon 3	Tosh Drag line	1-yr P	13,300 gal	1.1 mph	373,730 gal	28.1	76	32	67

Planned Nutrient Applications (Non-manure-spreadable Area)

Field	App. Month	Target Crop	Nutrient Source	Application Method	Rate Basis	Rate/Acre	Total Amount Applied	Acres Cov.	Avail N (lbs/ac)	Avail P_2O_5 (lbs/ac)	Avail K_2O (lbs/ac)
Gilkey 1A	Nov 2017	Small grain	0-0-60	Surface broadcast	1-yr K	100 lbs	1,170 lbs	11.7	0	0	60
Gilkey 1A	Jan 2018	Small grain	32-0-0	Surface broadcast	1-yr N	16 gal	187 gal	11.7	57	0	0
Gilkey 1A	Apr 2019	Corn grain	32-0-0	Surface broadcast	1-yr N	13 gal	152 gal	11.7	46	0	0
Gilkey 1A	Apr 2020	Corn grain	32-0-0	Surface broadcast	1-yr N	16 gal	187 gal	11.7	57	0	0
Gilkey 1A	Nov 2020	Small grain	0-0-60	Surface broadcast	1-yr K	100 lbs	1,170 lbs	11.7	0	0	60
Gilkey 1A	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	16 gal	187 gal	11.7	57	0	0
Gilkey 1A	Apr 2022	Corn grain	32-0-0	Surface broadcast	1-yr N	13 gal	152 gal	11.7	46	0	0
Gilkey 1B	Jan 2018	Small grain	32-0-0	Surface broadcast	1-yr N	12 gal	224 gal	18.7	42	0	0
Gilkey 1B	Jan 2020	Small grain	32-0-0	Surface broadcast	1-yr N	16 gal	299 gal	18.7	57	0	0
Gilkey 1B	Jan 2022	Small grain	32-0-0	Surface broadcast	1-yr N	16 gal	299 gal	18.7	57	0	0
Gilkey 2A	Nov 2017	Small grain	0-0-60	Surface broadcast	1-yr K	100 lbs	260 lbs	2.6	0	0	60
Gilkey 2A	Jan 2018	Small grain	32-0-0	Surface broadcast	1-yr N	19 gal	49 gal	2.6	67	0	0
Gilkey 2A	Apr 2019	Corn grain	32-0-0	Surface broadcast	1-yr N	29 gal	75 gal	2.6	102	0	0
Gilkey 2A	Apr 2020	Corn grain	32-0-0	Surface broadcast	1-yr N	35 gal	91 gal	2.6	124	0	0
Gilkey 2A	Nov 2020	Small grain	0-0-60	Surface broadcast	1-yr K	100 lbs	260 lbs	2.6	0	0	60
Gilkey 2A	Jan 2021	Small grain	32-0-0	Surface broadcast	1-yr N	19 gal	49 gal	2.6	67	0	0
Gilkey 2A	Apr 2022	Corn grain	32-0-0	Surface broadcast	1-yr N	22 gal	57 gal	2.6	78	0	0
Gilkey 2B	Jan 2018	Small grain	32-0-0	Surface broadcast	1-yr N	12 gal	82 gal	6.8	42	0	0
Gilkey 2B	Jan 2020	Small grain	32-0-0	Surface broadcast	1-yr N	16 gal	109 gal	6.8	57	0	0
Gilkey 2B	Apr 2021	Corn grain	32-0-0	Surface broadcast	1-yr N	32 gal	218 gal	6.8	113	0	0
Gilkey 2B	Jan 2022	Small grain	32-0-0	Surface broadcast	1-yr N	16 gal	109 gal	6.8	57	0	0

3.7. Field Nutrient Balance (Manure-spreadable Area)

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2018	Gilkey 1A	207.5	Small grain	70	90	80	20								
2018	Gilkey 1A	207.5	Soybean	50	0	10	40	90	65	136	0	-25	76	-10	41
2019	Gilkey 1A	207.5	Corn grain	220	220	180	90	180	97	203	-29[g]	-83	189	0	180
2020	Gilkey 1A	207.5	Corn grain	220	240	180	90	191	97	203	-30[g]	-83	302	0	319
2021	Gilkey 1A	207.5	Small grain	70	90	80	20								
2021	Gilkey 1A	207.5	Soybean	50	0	10	40	58	42	88	-12[g]	-48	330	-33	312
2022	Gilkey 1A	207.5	Corn grain	220	220	180	90	178	96	200	-31[g]	-84	440	-1	448
Total	**Gilkey 1A**				**860**	**720**	**390**	**697**	**397**	**830**					
2018	Gilkey 1B	187.1	Small grain	70	75	80	0								
2018	Gilkey 1B	187.1	Soybean	50	0	10	0	75	32	66	0	-58	66	-43	-29
2019	Gilkey 1B	187.1	Corn grain	200	190	160	0	185	78	162	0[g]	-82	228	-10	104
2020	Gilkey 1B	187.1	Small grain	70	90	80	0								
2020	Gilkey 1B	187.1	Soybean	50	0	10	0	77	32	68	1[g]	-58	296	-43	77
2021	Gilkey 1B	187.1	Corn grain	200	190	160	0	182	77	160	0[g]	-83	456	-11	179
2022	Gilkey 1B	187.1	Small grain	70	90	80	0								
2022	Gilkey 1B	187.1	Soybean	50	0	10	0	76	32	67	0[g]	-58	523	-43	151
Total	**Gilkey 1B**				**635**	**590**	**0**	**595**	**251**	**523**					
2018	Gilkey 2A	95.2	Small grain	70	90	40	20								
2018	Gilkey 2A	95.2	Soybean	50	0	20	40	90	65	136	0	5	76	-10	41
2019	Gilkey 2A	95.2	Corn grain	220	220	90	90	208	77	161	-1[g]	-8	147	-20	138
2020	Gilkey 2A	95.2	Corn grain	220	240	90	90	218	68	142	-6[g]	-22	199	-29	216
2021	Gilkey 2A	95.2	Small grain	70	90	40	20								
2021	Gilkey 2A	95.2	Soybean	50	0	20	40	70	51	106	-6[g]	-9	245	-24	227
2022	Gilkey 2A	95.2	Corn grain	220	220	90	90	212	97	203	3[g]	7	358	0	366
Total	**Gilkey 2A**				**860**	**390**	**390**	**798**	**358**	**748**					
2018	Gilkey 2B	28.1	Small grain	70	75	80	0								
2018	Gilkey 2B	28.1	Soybean	50	0	10	0	75	32	66	0	-58	66	-43	-29

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2019	Gilkey 2B	28.1	Corn grain	200	190	160	0	185	78	162	0[g]	-82	228	-10	104
2020	Gilkey 2B	28.1	Small grain	70	90	80	0								
2020	Gilkey 2B	28.1	Soybean	50	0	10	0	77	32	68	1[g]	-58	296	-43	77
2021	Gilkey 2B	28.1	Corn grain	200	190	160	0	123	4	9	-59[g]	-156	305	-84	28
2022	Gilkey 2B	28.1	Small grain	70	90	80	0								
2022	Gilkey 2B	28.1	Soybean	50	0	10	0	76	32	67	-12[g]	-58	372	-43	0
Total	**Gilkey 2B**				**635**	**590**	**0**	**536**	**178**	**372**					

Field Nutrient Balance (Non-manure-spreadable Area)

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2018	Gilkey 1A	11.7	Small grain	70	90	80	20								
2018	Gilkey 1A	11.7	Soybean	50	0	10	40	57	0	60	-33	-90	0	-75	-35
2019	Gilkey 1A	11.7	Corn grain	220	220	180	90	46	0	0	-174	-180	-90	-97	-64
2020	Gilkey 1A	11.7	Corn grain	220	240	180	90	57	0	0	-183	-180	-90	-97	-64
2021	Gilkey 1A	11.7	Small grain	70	90	80	20								
2021	Gilkey 1A	11.7	Soybean	50	0	10	40	57	0	60	-33	-90	0	-75	-35
2022	Gilkey 1A	11.7	Corn grain	220	220	180	90	46	0	0	-174	-180	-90	-97	-64
Total	**Gilkey 1A**				**860**	**720**	**390**	**263**	**0**	**120**					
2018	Gilkey 1B	18.7	Small grain	70	75	80	0								
2018	Gilkey 1B	18.7	Soybean	50	0	10	0	42	0	0	-33	-90	0	-75	-95
2019	Gilkey 1B	18.7	Corn grain	200	190	160	0	0	0	0	-190	-160	0	-88	-58
2020	Gilkey 1B	18.7	Small grain	70	90	80	0								
2020	Gilkey 1B	18.7	Soybean	50	0	10	0	57	0	0	-33	-90	0	-75	-95
2021	Gilkey 1B	18.7	Corn grain	200	190	160	0	0	0	0	-190	-160	0	-88	-58
2022	Gilkey 1B	18.7	Small grain	70	90	80	0								
2022	Gilkey 1B	18.7	Soybean	50	0	10	0	57	0	0	-33	-90	0	-75	-95
Total	**Gilkey 1B**				**635**	**590**	**0**	**156**	**0**	**0**					
2018	Gilkey 2A	2.6	Small grain	70	90	40	20								

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[a]			Nutrients Applied[b]			Balance After Recs[c]			Balance After Removal[d]	
		ac		per ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
2018	Gilkey 2A	2.6	Soybean	50	0	20	40	67	0	60	-23	-60	0	-75	-35
2019	Gilkey 2A	2.6	Corn grain	220	220	90	90	102	0	0	-118	-90	-90	-97	-64
2020	Gilkey 2A	2.6	Corn grain	220	240	90	90	124	0	0	-116	-90	-90	-97	-64
2021	Gilkey 2A	2.6	Small grain	70	90	40	20								
2021	Gilkey 2A	2.6	Soybean	50	0	20	40	67	0	60	-23	-60	0	-75	-35
2022	Gilkey 2A	2.6	Corn grain	220	220	90	90	78	0	0	-142	-90	-90	-97	-64
Total	**Gilkey 2A**				**860**	**390**	**390**	**438**	**0**	**120**					
2018	Gilkey 2B	6.8	Small grain	70	75	80	0								
2018	Gilkey 2B	6.8	Soybean	50	0	10	0	42	0	0	-33	-90	0	-75	-95
2019	Gilkey 2B	6.8	Corn grain	200	190	160	0	0	0	0	-190	-160	0	-88	-58
2020	Gilkey 2B	6.8	Small grain	70	90	80	0								
2020	Gilkey 2B	6.8	Soybean	50	0	10	0	57	0	0	-33	-90	0	-75	-95
2021	Gilkey 2B	6.8	Corn grain	200	190	160	0	113	0	0	-77	-160	0	-88	-58
2022	Gilkey 2B	6.8	Small grain	70	90	80	0								
2022	Gilkey 2B	6.8	Soybean	50	0	10	0	57	0	0	-33	-90	0	-75	-95
Total	**Gilkey 2B**				**635**	**590**	**0**	**269**	**0**	**0**					

[a] Fertilizer Recs are the crop fertilizer recommendations. The N rec accounts for any N credit from previous legume crop.

[b] Nutrients Applied are the nutrients expected to be available to the crop from that year's manure applications plus nutrients from that year's commercial fertilizer applications and nitrates from irrigation water. With a double-crop year, the total nutrients applied for both crops and the year's balances are listed on the second crop's line.

[c] For N, Nutrients Applied minus Fertilizer Recs for indicated crop year. Also includes amount of residual N expected to become available that year from prior years' manure applications. For P_2O_5 and K_2O, Nutrients Applied minus Fertilizer Recs *through* the indicated crop year, with positive balances carried forward to subsequent years. Negative values indicate a potential need to apply additional nutrients.

[d] Nutrients Applied minus amount removed by harvested portion of crop through the indicated year. Positive balances are carried forward to subsequent years.

[e] Custom fertilizer recommendation.

[f] Legume crop is assumed to utilize some or all of the supplied N.

[g] Includes residual N expected to become available that year from prior years' manure applications.

3.8. Manure Inventory Annual Summary (Optional)

Manure Source	Plan Period	On Hand at Start of Period	Total Generated	Total Imported	Total Trans-ferred In	Total Applied	Total Exported	Total Trans-ferred Out	On Hand at End of Period	Units
Lagoon 1	Oct '17 - Sep '18	2,000,000	0	0	0	0	0	0	2,000,000	gal
Lagoon 2	Oct '17 - Sep '18	3,000,000	0	0	0	0	0	0	3,000,000	gal
Lagoon 3	Oct '17 - Sep '18	5,000,000	14,000,000	0	0	11,074,080	0	0	7,925,920	gal
All Sources	**Oct '17 - Sep '18**	**10,000,000**	**14,000,000**	**0**	**0**	**11,074,080**	**0**	**0**	**12,925,920**	**gal**
Lagoon 1	Oct '18 - Sep '19	2,000,000	0	0	0	0	0	0	2,000,000	gal
Lagoon 2	Oct '18 - Sep '19	3,000,000	0	0	0	0	0	0	3,000,000	gal
Lagoon 3	Oct '18 - Sep '19	7,925,920	14,000,000	0	0	18,426,620	0	0	3,499,300	gal
All Sources	**Oct '18 - Sep '19**	**12,925,920**	**14,000,000**	**0**	**0**	**18,426,620**	**0**	**0**	**8,499,300**	**gal**
Lagoon 1	Oct '19 - Sep '20	2,000,000	0	0	0	0	0	0	2,000,000	gal
Lagoon 2	Oct '19 - Sep '20	3,000,000	0	0	0	0	0	0	3,000,000	gal
Lagoon 3	Oct '19 - Sep '20	3,499,300	14,000,000	0	0	14,000,400	0	0	3,498,900	gal
All Sources	**Oct '19 - Sep '20**	**8,499,300**	**14,000,000**	**0**	**0**	**14,000,400**	**0**	**0**	**8,498,900**	**gal**
Lagoon 1	Oct '20 - Sep '21	2,000,000	0	0	0	0	0	0	2,000,000	gal
Lagoon 2	Oct '20 - Sep '21	3,000,000	0	0	0	0	0	0	3,000,000	gal
Lagoon 3	Oct '20 - Sep '21	3,498,900	14,000,000	0	0	11,667,002	0	0	5,831,898	gal
All Sources	**Oct '20 - Sep '21**	**8,498,900**	**14,000,000**	**0**	**0**	**11,667,002**	**0**	**0**	**10,831,898**	**gal**
Lagoon 1	Oct '21 - Sep '22	2,000,000	0	0	0	0	0	0	2,000,000	gal
Lagoon 2	Oct '21 - Sep '22	3,000,000	0	0	0	0	0	0	3,000,000	gal
Lagoon 3	Oct '21 - Sep '22	5,831,898	14,000,000	0	0	15,017,760	0	0	4,814,138	gal
All Sources	**Oct '21 - Sep '22**	**10,831,898**	**14,000,000**	**0**	**0**	**15,017,760**	**0**	**0**	**9,814,138**	**gal**

3.9. Fertilizer Material Annual Summary (Optional)

Product Analysis	Plan Period	Product Needed Oct - Dec	Product Needed Jan - Sep	Total Product Needed	Units
0-0-60	Oct '17 - Sep '18	1,430	0	1,430	lbs
32-0-0	Oct '17 - Sep '18	0	542	542	gal
32-0-0	Oct '18 - Sep '19	0	5,686	5,686	gal
32-0-0	Oct '19 - Sep '20	0	7,338	7,338	gal
0-0-60	Oct '20 - Sep '21	1,430	0	1,430	lbs
32-0-0	Oct '20 - Sep '21	0	1,353	1,353	gal
32-0-0	Oct '21 - Sep '22	0	5,410	5,410	gal

3.10. Plan Nutrient Balance (Manure-spreadable Area)

	N (lbs)	P_2O_5 (lbs)	K_2O (lbs)
Total Manure Nutrients on Hand at Start of Plan[a]	58,900	22,800	50,000
Total Manure Nutrients Collected[b]	469,000	168,000	350,000
Total Manure Nutrients Imported[c]	0	0	0
Total Manure Nutrients Exported[d]	0	0	0
Total Manure Nutrients Gained/Lost in Transfer[e]	0	0	0
Total Manure Nutrients on Hand at End of Plan[f]	57,655	22,354	49,071
Total Manure Nutrients Applied[g]	469,706	168,377	351,668
Available Manure Nutrients Applied (Utilized by plan's crops)[h]	309,968	168,377	351,668
Available Manure Nutrients Applied (Not utilized by plan's crops)[i]	8,516	0	0
Commercial Fertilizer Nutrients Applied (Utilized by plan's crops)[j]	63,034	0	0
Commercial Fertilizer Nutrients Applied (Not utilized by plan's crops)[k]	0	0	0
Available Nutrients Applied (Manure and fertilizer; utilized by plan's crops)[l]	373,002	168,377	351,668
Nutrient Utilization Potential[m]	647,174	351,121	225,537
Nutrient Balance of Spreadable Acres[n p]	-274,172	-182,744	126,131
Average Nutrient Balance per Spreadable Acre per Year[o p]	-106	-71	49

a. Total manure nutrients present in storage at the beginning of the plan.
b. Total manure nutrients collected on the farm.
c. Total manure nutrients imported onto the farm.
d. Total manure nutrients exported from the farm to an external operation.
e. Net change in total manure nutrients due to transfers between storage units with differing analyses.
f. Total manure nutrients present in storage at the end of plan.
g. Total nutrients present in land-applied manure. These values do not account for losses due to rate, timing, and method of application.
h. Manure nutrients applied and available to crops in the plan. These values are based on the total manure nutrients applied after accounting for nutrient losses due to rate, timing, and method of application. Nutrients which will not be utilized by crops in the plan are excluded from these values.
i. Manure nutrients applied that will be utilized by crops outside the plan. This usually results from Fall nutrient applications at the end of the plan intended for crops in subsequent years.
j. Nutrients applied as commercial fertilizers and nitrates contained in irrigation water. Nutrients that will not be utilized by crops in the plan are excluded from these values.
k. Nutrients applied as commercial fertilizer which will be utilized by crops outside the plan.
l. Sum of available manure nutrients applied and commercial fertilizer nutrients applied.
m. Nutrient utilization potential of crops grown. For N the value is based on the N recommendation for non-legume crops and N uptake or other state-imposed limit for N application rates for legumes. P_2O_5 and K_2O values are based on fertilizer recommendations or crop removal (whichever is greater).
n. Available nutrients applied minus crop nutrient utilization potential. Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
o. Average per acre-year nutrient balance. Values are calculated by dividing nutrient balance of spreadable acres by the number of spreadable acres in the plan and by the length of the plan in years. Negative values indicate additional nutrient utilization potential and positive values indicate over-application.

p. Non-trivial, positive values for N indicate that the plan was not properly developed. Negative values for N indicate additional nutrient utilization potential which may or may not be intentional. For example, plans that include legume crops often will not utilize the full N utilization potential for legume crops if manure can be applied to non-legume crops that require N for optimum yield. Positive values for P_2O_5 and/or K_2O do not necessarily indicate that the plan was developed improperly. For example, producers may be allowed to apply N-based application rates of manure to fields with low soil test P values or fields with a low potential P-loss risk based on the risk assessment tool used by the state. Negative values for P_2O_5 and K_2O indicate that planned applications to some fields are less than crop removal rates or fertilizer recommendations.

Plan Nutrient Balance (Non-manure-spreadable Area)

	N (lbs)	P_2O_5 (lbs)	K_2O (lbs)

	N (lbs)	P_2O_5 (lbs)	K_2O (lbs)
Commercial Fertilizer Nutrients Applied[a]	8,962	0	1,716
Nutrient Utilization Potential[b]	28,491	24,483	5,577
Nutrient Balance of Non-spreadable Acres[c e]	-19,529	-24,483	-3,861
Average Nutrient Balance per Non-spreadable Acre per Year[d e]	-98	-123	-19

a. Nutrients applied as commercial fertilizers and nitrates contained in irrigation water.
b. Nutrient utilization potential of crops grown based on crop fertilizer recommendations.
c. Commercial fertilizer nutrients applied minus crop nutrient utilization potential. Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
d. Average per acre-year nutrient balance. Values are calculated by dividing nutrient balance of non-spreadable acres by number of non-spreadable acres in plan and by the length of the plan in years. Negative values indicate additional nutrient utilization potential and positive values indicate over-application.

e. Non-trivial, positive values for N indicate that the plan was not properly developed. Negative values for N indicate additional nutrient utilization potential which may or may not be intentional. Positive values for P_2O_5 and/or K_2O do not necessarily indicate that the plan was developed improperly. For example, multiple year applications may have been planned during the final plan year(s) and these nutrients will not be utilized by crops in the current plan. Negative values for P_2O_5 and K_2O indicate that applications to some fields may have been delayed to allow the producer to apply the nutrients in accordance with their fertilization schedule.

Closure Plan

In the event that Swine production at this location ceases, the following will be done within 360 days:

- All manure in all animal use areas will be removed and spread on the farm or spread elsewhere according to my current Nutrient Management Plan.
- The most current manure analysis will be provided to anyone removing manure from the farm.
- Any dead pigs on the farm will be disposed of at the time of closure according to methods outlined in my current Nutrient Management Plan and or allowable by Tennessee Law.
- Any manure which is land applied will be done so according to the rates discussed in my most recent Nutrient Management Plan.

The following will be completed within a reasonable period as allowable by law using Tennessee Natural Resources Conservation Service (NRCS) Standard Code 360- Closure of Waste Impoundments:

- Any manure storage facility (lagoon) located on the swine farm will be properly decommissioned.
- Any manure currently in storage at the time of closure will be removed and spread on the farm or spread elsewhere according to my current Nutrient Management Plan.
- The lagoon will be breached and backfilled and or converted to freshwater storage according to NRCS standards.

Date: 2/22/18

Record Keeping

This section includes a list of key records that Mr. Tosh will keep in order to document and verify implementation of the procedures in this CNMP. Records shall be kept for a minimum of 5 years, or for the length of the contract, rotation, or permit, whichever is longer, for each field where manure is applied.

These general records include but are not limited to:

1. Soil Test Results
2. Weather and soil conditions 24 hours prior to, during and 24 hours application of manure, chemicals and pesticides.
3. Type, quantities, and sources of all nutrients generated and collected
4. Type, quantities, and sources of all nutrients applied to each field
5. Dates of manure applications
6. Inspection Reports
7. Operation and Maintenance records of conservation practices and equipment
8. Restricted pesticides used to meet label requirements
9. Equipment Calibration records
10. Crops planted, tillage method and dates planted
11. Crop harvest dates and yield
12. Adjustments to nutrient management plan based on records and changes in farming operations as appropriate
13. Weekly check of volume in pit
14. Annual visual inspection of retention structure (pits), animal holding areas, if applicable and land application areas
15. Records of mortalities and how managed

Declarations to Nutrient Management Plan:

By my signature below, I affirm that I have read, understand, and will comply with the following stipulations from Tennessee's CAFO regulations that apply to my CAFO operation:

1) All animals in confinement are prevented from coming in direct contact with waters of the state.
2) All chemicals and other contaminants handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants.
3) Pesticide-contaminated waters will be prevented from discharging into waste retention structures. Waste from pest control and from facilities used to manage potentially hazardous or toxic chemicals shall be handled and disposed of in a manner that will prevent pollutants from entering waste retention structures or waters of the state.
4) Chemicals, manure/litter, and process wastewater will be managed to prevent spills. Spill clean-up plans will be developed and any equipment needed for spill clean-up will be available to facility personnel.
5) All sampling of soil and manure/litter is conducted according to protocols developed by UT Extension.
6) All records outlined in the permit that I am applying for will be maintained and available on-site.
7) Any confinement buildings, waste/wastewater handling or treatment systems, lagoons, holding ponds, and any other agricultural waste containment/treatment structures constructed or modified after April 13, 2006, are or will be located in accordance with NRCS Conservation Practice Standard 313.
8) A copy of the most recent Nutrient Management Plan will be kept as part of the farm records and will be maintained and implemented as written.
9) If applicable, all waste directed to under floor pits shall be composed entirely of wastewater (i.e. washwater and animal waste).
10) The Tennessee Department of Environment and Conservation Division of Water Resources will be notified of any significant wildlife mortalities near retention ponds or following any land application of animal wastes to fields.
11) All employees involved in work activities that relate to permit compliance will receive regular training on proper operation and maintenance (O&M) of the facility and waste disposal. Training shall include appropriate topics, such as land application of wastes, good housekeeping and material management practices, proper O&M of the facility, record keeping, and spill response and clean up. The periodic scheduled dates for such training shall be identified in the current Nutrient Management Plan.
12) There shall be no land application of nutrients within 24 hours of a precipitation event that may cause runoff. The operator shall not land apply nutrients to frozen, flooded, or saturated soils.

Signature of CAFO Owner/Operator

2/22/18
Date

Operation and Maintenance

Mr. Tosh is responsible for safe operation and maintenance of the nutrient management plan including all equipment. Operation and maintenance includes the following items:

1. periodic plan review to determine if adjustments or modifications to the plan are needed. As minimum, plans will be reviewed/revised with each soil test cycle.
2. weekly there will be a visual inspection of pits
3. calibration of application equipment to ensure uniform distribution of material at planned rates.
4. documentation of the actual rate at which nutrients were applied. When the actual rates used differ from or exceed the recommended and planned rates, records will indicate the reasons for the differences.
5. Maintaining records to document plan implementation. As applicable, records include
    a. Soil test results and recommendations for nutrient application
    b. Quantities, analysis and sources of nutrients applied
    c. Dates and method of nutrient applications
    d. Crops planted, planting and harvest dates, yields, and residues removed
    e. Results of water, plant and organic byproduct analysis
    f. Dates of review and person performing the review and recommendations
    g. Conservation practices being applied.

Records will be maintained for five years or for a period longer than five years if required by other Federal, state, or local ordinances or program or contract requirements.

The disposal of material generated by the cleaning nutrient application equipment accomplished properly. Excess material should be collected and stored or field applied in an appropriate manner. Excess material should not be applied on areas of high potential risk for runoff and leaching.

The disposal/recycling of nutrient containers should be according to state and local guidelines or regulations.

Pesticides, toxic chemicals, and petroleum products will not be used in areas where leakage could enter the manure storage facility.

Conservation Practices Operation & Maintenance

Heavy Use Area Protection

The Operation and Maintenance (O&M) plan shall specify that the treatment areas and associated practices will be inspected annually and after significant storm events to identify repair and maintenance needs. The O&M plan shall contain the operational requirements for managing the heavy use area. Planned scraping intervals, replacement of fine material, storage, treatment, and/or utilization methods will also be described. Provisions for re-establishment of vegetated areas will be included. The O&M plan shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice. If using a front-end loader, recommend back dragging the manure/hay to conserve removal of gravel from the surface. Consider using fabricated large equipment tire for scraping surface. The O&M plan shall be provided to, and discussed with, the operator. The O&M plan must complement the Comprehensive Nutrient Management Plan, as necessary.

Composting Facility

An operation and maintenance (O&M) plan shall be developed consistent with the purposes of this standard, its intended life, safety requirements, and the criteria for its design. The O&M plan shall include recipe ingredients and sequence that they are layered and mixed, maximum and minimum temperature for operation, land application rates, moisture level, management of odors, testing, etc. Make adjustments throughout the composting period to ensure proper composting processes. The compost facility should be inspected regularly when the facility is empty. Replace deteriorated wooden materials or hardware. Patch concrete floors and curbs as necessary to assure water tightness. Roof structures should be examined for structural integrity and repaired as needed. Exposed metal components should be inspected for corrosion. Corroded metal should be wire brushed and painted as necessary. Closely monitor temperatures above 165^{o}F. Take action immediately to cool piles that have reached temperatures above 185^{o}F. The operation and maintenance plan shall state that composting is a biological process. It requires a combination of art and science for success. Hence, the operation may need to undergo some trial and error in the start-up of a new composting facility.

Nutrient Management (590)

The owner/client is responsible for safe operation and maintenance of the nutrient management plan including all equipment. Operation and maintenance addresses the following:

1. periodic plan review to determine if adjustments or modifications to the plan are needed. As a minimum, plans will be reviewed/revised with each soil test cycle.
2. protection of fertilizer and organic byproduct storage facilities from weather and accidental leakage or spillage.
3. calibration of application equipment to ensure uniform distribution of material at planned rates.
4. documentation of the actual rate at which nutrients were applied. When the actual rates used differ from or exceed the recommended and planned rates, records will indicate the reasons for the differences.
5. Maintaining records to document plan implementation. As applicable, records include:

soil test results and recommendations for nutrient application,

quantities, analyses and sources of nutrients applied,

dates and method of nutrient applications,

crops planted, planting and harvest dates, yields, and residues removed,

results of water, plant, and organic byproduct analyses, and

dates of review and person performing the review, and recommendations.

Records should be maintained for five years or for a period longer than five years if required by other Federal, state, or local ordinances, or program or contract requirements. Workers shall be protected from and avoid unnecessary contact with chemical fertilizers and organic by-products. Protection should include the use of protective clothing when working with plant nutrients. Extra caution must be taken when handling ammonia sources of nutrients, or when dealing with organic wastes stored in unventilated enclosures. The disposal of material generated by the cleaning nutrient application equipment should be accomplished properly. Excess material should be collected and stored or field applied in an appropriate manner. Excess material should not be applied on areas of high potential risk for runoff and leaching. The disposal/recycling of nutrient containers should be according to state and local guidelines or regulations.

UTEXTENSION
INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF TENNESSEE

SOIL TEST REPORT

. TOSH FARMS
1586 ATLANTIC AVENUE
HENRY TN 38231

County: Henry

Robert Florence, Director
5201 Marchant Drive
Nashville, TN 37211-5112
(615) 832-5850
soilplantpestcenter@utk.edu

Mehlich 1 SOIL TEST RESULTS and RATINGS* (Pounds Per Acre)

Lab Number	Report Date	Farm ID	Sample Number	pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
				Soil pH	Buffer Value	P LBS/ACRE	K LBS/ACRE	CA LBS/ACRE	Mg LBS/ACRE	Zn LBS/ACRE	Fe LBS/ACRE	Mn LBS/ACRE	B LBS/ACRE	Na LBS/ACRE
539902	03/31/2017	none	4	6.08		20 M	168 H	2457 S	230 S	2 S	22 S	25 S	0.4	8
539903	03/31/2017	F-1	1	6.3		11 L	119 M	2177 S	225 S	1.1 S	15 S	27 S	0.3	8
539904	03/31/2017	F-1	2	6.6		11 L	191 H	2798 S	279 S	1.8 S	13 S	33 S	0.5	7
539905	03/31/2017	F-1	3	6.75		26 M	118 M	2226 S	130 S	2 S	9 S	40 S	0.4	7
539906	03/31/2017	F-1	5	5.97	7.57	14 L	228 H	1553 S	128 S	2.7 S	13 S	47 S	0.4	7
539907	03/31/2017	F-1	6	6.66		18 L	90 L	3139 S	294 S	2 S	12 S	27 S	0.5	8
539908	03/31/2017	F-1	7	6.43		26 M	188 H	1808 S	147 S	1.4 S	14 S	29 S	0.4	6
539909	03/31/2017	F-1	8	6.67		16 L	204 H	2462 S	187 S	2 S	14 S	55 S	0.5	6
539910	03/31/2017	F-1	9	6.41		17 L	128 M	1991 S	157 S	2.8 S	12 S	40 S	0.3	7
539911	03/31/2017	F-1	10	6.62		245 V	174 H	2529 S	208 S	43.6 S	29 S	48 S	0.5	7

Lab Number	Farm ID	Sample Number	Sulfur	Nitrogen		Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	% Sand	% Silt	% Clay	Soil Texture
539902	none	4											
539903	F-1	1											
539904	F-1	2											
539905	F-1	3											
539906	F-1	5											
539907	F-1	6											
539908	F-1	7											
539909	F-1	8											
539910	F-1	9											
539911	F-1	10											

Waters Agricultural Laboratories, Inc.

Manure/Sludge Analysis and Application Report

2101 Calhoun Rd. Highway 81 Owensboro, Kentucky 42301 Phone: (270) 685-4039

Ship To:
JT Workman
3385 State Rte 1826
Clinton, KY 42031-

Grower: [redacted] Tosh
SampleNumber: [redacted] Gilkey
Lab Number: 35609MS
Type: Manure
Date Submitted: 01/30/2017
Report Date: 01/31/2017

	Parts per million (ppm)	Pounds per 1000 gallons
Nitrogen – Total	809.5	6.751
Ammonia Nitrogen	459.2	3.830
P2O5 – Total	291.9	2.434
K2O –Total	594.3	4.956

Moisture	89.83 %	

Results Reported On: L=LIQUID BASIS

Remarks Suggest the use of PLANT and SOIL analysis to monitor the need for additional and/or build up of some elements

Tennessee Phosphorus Index

Operation: T & T Gilkey ***County:*** Henry ***Plan Saved:*** 2/21/2018
Plan File: Gilkey.mmp ***State:*** Tennessee ***Init. File Rev:*** 4/6/2015
Plan Folder: C:\Users\J.T. Workman IV\Dropbox\Tennessee Department of Agriculture\T&T Gilkey ***Soils File Rev:*** 1/11/2016

Field	Crop Year	Site Total	Management Total	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
Gilkey 1A	2018	11	16	11	176	Medium
Gilkey 1A	2019	11	20	11	220	Medium
Gilkey 1A	2020	11	20	11	220	Medium
Gilkey 1A	2021	11	14	11	154	Medium
Gilkey 1A	2022	11	20	11	220	Medium
Gilkey 1B	2018	11	6	11	66	Low
Gilkey 1B	2019	11	14	11	154	Medium
Gilkey 1B	2020	11	7	11	77	Low
Gilkey 1B	2021	12	11	12	132	Low
Gilkey 1B	2022	11	6	11	66	Low
Gilkey 2A	2018	11	16	11	176	Medium
Gilkey 2A	2019	11	18	11	198	Medium
Gilkey 2A	2020	11	17	11	187	Medium
Gilkey 2A	2021	11	15	11	165	Medium
Gilkey 2A	2022	11	20	11	220	Medium
Gilkey 2B	2018	11	6	11	66	Low
Gilkey 2B	2019	11	11	11	121	Low
Gilkey 2B	2020	11	7	11	77	Low
Gilkey 2B	2021	11	3	11	33	Low
Gilkey 2B	2022	11	6	11	66	Low