MURPHY BROWN, LLC
Mount Erie Complex

NUTRIENT MANAGEMENT PLAN

Prepared for:

Murphy-Brown LLC

Prepared by:

MAURER-STUTZ

ENGINEERS SURVEYORS

3116 North Dries Lane, Suite 100
Peoria, IL 61604

Date:

May 14, 2025

Daniel N. Feucht, CCA
Registration # 641183
Expires: 12-31-2026

SIGNATURE: ______________________

DATE : 5-14-2025

MSI Project No. 23804009.11

S:\238\2004 project numbers\23804009.11(Smithfield-NMP Updates)\2013 Manure Management Plan writeup.doc

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Appendix

Purpose

The purpose of this manure management plan is to detail the procedures that will be followed in the operation of Murphy-Brown - Mt. Erie Swine Facilities of Mt. Erie, IL (f/k/a Alliance Farms). The plan contains provisions for removal of livestock waste, and the application of these materials to cropland at agronomic rates. This plan is intended to meet or exceed the requirements of the Livestock Facilities Management Act Subpart H, Waste Management Plan.

SECTION 1. BACKGROUND INFORMATION

1.1. General Description of Operation

Murphy-Brown Mt. Erie Complex is approximately 6104 AU swine operation consisting of five (5) units/farms. The operation has and plans to continue applying manure to cropland using agronomic rates as would be used with the additions of chemical fertilizers.

The complex is managed by Murphy-Brown, LLC d/b/a Smithfield Hog Production and the units/farms are owned by Murphy-Brown, LLC. The operation consists of shallow pit barns with single and two stage lagoons. Waste falls thru the slatted floors in the barns to shallow pits from which it then flows by gravity to a lagoon or lift station that pumps it to a 1 or 2-stage treatment lagoon system. The lagoons have an operation and management plan for pumping and sludge removal. Liquid effluent form the lagoons is transferred off site and land applied to cropland owned and controlled by several area farmers none of which is owned by the facility.

Current Facilities Capacities – After Remodel							
Facility	Nursery	Gest Gilts	Gest Sows	Lact Sows	Boars	Wean-Finish	Total
Average weight	6 lb	300 lb	400 lb	400 lb	325 lb	135	
Mt. Erie 4088	3640	0	1459	364	4	0	5467
Lakeview 4089/4093	3640	0	1494	364	4	0	5502
Elm River 4090	3640	0	1298	364	4	0	5306
Little Wabash 4091/4391	3840	0	1391	384	4	0	5619
Lakeside 4092	0	1600	0	0	20	5400	7020
Total	14760	1600	5642	1476	36	5400	28914
IDA Animal Units	443	640	2257	590	14	2160	6104

Over 2000 acres are available for use by this facility for land application of manure.

Application Methods

Liquid manure will be subsurface injected on all row cropland (corn, soybeans, wheat, etc.). Murphy-Brown plans to continue to sample and lab test manure. Using historical lab test results and verifying the consistency of nutrient content to specific containments, we are planning future applications based on updated historical data.

Manure is not applied to saturated soils or allowed to stand unincorporated. Proper setback distances are observed and a defined spill contingency plan is in place.

Owner Information

Site Name	Murphy-Brown - Mt. Erie Complex
Owner Name	Murphy-Brown, L.L.C.
Address	17999 US Highway 65
City, State, Zip	Princeton, MO 64673
Phone #	

Manager/Operator Information

Manager/Operator	Murphy-Brown, L.L.C.
Site Manager	Kelly Fitch
Certification #	LM11368
Address	2149 County Road 2400 E
City, State, Zip	Mt. Erie, IL 62446
Phone #	

Facility Information

Address	Rt1 Box 30A, Mt Erie, IL 62446
Plat Location	Farm 4088 & 4090 - SE ¼ Section 36 T02N R08E – 3rd P.M. Farm 4089 SE ¼ NE ¼ Section 01 T01N R08E – 3rd P.M. Farm 4091 & 4092 NE ¼ SE ¼ Section 01 T01N R08E – 3rd P.M.
Directions from nearest post office	From the Mount Erie Post Office go west three blocks. The road curves to the right (north) and goes three more blocks. At the T intersection turn left (west) on road 1850N and go approximately 1 mile to T intersection. Turn right (north) on road 2440 E and follow the road curving to the west to road 2400E and turn right (north). From this intersection the production facilities are as follows: 4088 – 4 miles North 4089 – 1.75 miles North 4090 – 3.75 miles North 4091 – 1.5 miles north and ¼ mile west 4092 – 1.5 miles north and ½ mile west
Phone #	

1.2. Sampling, Calibration and Other Statements

- Manure sampling frequency
  - Manure shall be analyzed on an annual basis from each storage structure for: % Solids, Total N, Organic N, NH4 or NH3, P2O5, K2O, and pH.
  - SEE APPENDIX C (Manure Analysis/Sampling Procedures & Results)
- Soil testing frequency
  - Soil tests will be taken twice every five years on each field owned or operated by Murphy-Brown, LLC.
  - Soil tests will be taken using University of Illinois Agronomy Handbook recommendations.
  - SEE APPENDIX B (Soil Testing Procedures & Results)
- Equipment calibration method and frequency
  - SEE APPENDIX D (Soil Testing Procedures & Results)
- Clean water diversion
- Measures to prevent direct contact of animals with water

Section 2. Manure Waste Water Storage and Handling

2.1. Map(s) of Production Area

(See attached Farmstead at end of this Section)

Production Site General Recommendations

General Appearance
1. Production site should be free of weeds and trash
2. Building perimeter and driveways should be free of spilled or leaking manure
3. Production site should be free of spilled feed.
4. Insects and rodents should be controlled.
5. Windbreaks and visual barriers should be in place and maintained.

Perimeter Drains and Surface Drainage
1. All subsurface drainage should be open and operating.
2. Subsurface drainage and field tiles should be free of manure.
3. Water diversion ditches and secondary spillways should be properly vegetated and not eroding.
4. All sink holes and open tile inlets should be well protected and maintained.
5. Building roof water should be properly diverted and drained away from the facilities.

Building Foundations and Pit Walls
1. Foundations and pit walls should be free of cracks and seepage.
2. Pump-outs should be properly covered and maintained.
3. Gravel strips 2-3' wide should line the perimeter of the buildings.
4. Rodent deterrent trim should be in place.
5. Landscaping around buildings should be properly graded to drain surface water away from buildings.

2.2. Production Area Conservation Practices (Other than waste storage/treatment)

a. Air Quality Impact Mitigation

See MSI Air Quality and Pathogen Management Considerations Statement attached in Appendix F.

b. Conservation Alternatives Considered – N/A

c. Conservation Practice Planning – N/A

2.3. Waste Storage and Treatment

Existing Manure Storage

Storage ID	Type of Storage	Storage Capacity	Annual Manure/ Wastewater Collected	Estimated Days of Storage
Mt. Erie 4088	Earthen Lagoon Underfloor liquid storage	5,420,000 Gal	2,710,000 Gal	365
Lakeview 4089/4093	Earthen Lagoon Underfloor liquid storage	2,630,000 Gal	2,120,000 Gal	330
Elm River 4090	Earthen Lagoon Underfloor liquid storage	4,680,000 Gal	2,900,000 Gal	365
Little Wabash 4091/4391	Earthen Lagoon Underfloor liquid storage	4,230,000 Gal	2,560,000 Gal	365
Lakeside 4092	Earthen Lagoon Underfloor liquid storage	4,240,000 Gal	4,050,000 Gal	365

a-c: See attached existing Maurer-Stutz, Inc. Animal Waste Management calculations for more detail.

	Annual Manure Nutrients As Excreted		
Type	**Nitrogen lb**	**P2O5 lb**	**K2O lb**
Mt. Erie 4088	65,397	43,004	49,785
Lakeview 4089/4093	66,215	43,589	50,465
Elm River 4090	61,636	40,312	46,656
Little Wabash 4091/4391	65,526	42,887	49,638
Lakeside 4092	126,816	93,452	75,092
Totals	**385,590**	**263,244**	**271,636**

* The values are the values presented in Table 6 of MWPS 18 Section 1 Second Edition.
** Nutrient calculations are derived from Table 6 of MWPS 18 Section 1 Second Edition.
*** The real nutrient content of manure is affected by nutritional programs and feed and water wastage due to management practices. Manure should be sampled and tested at-least bi-annually or after each application event.

Estimated Land Application Requirements

Nitrogen production values, Nitrogen storage losses, Ammonia nitrogen losses, and organic nitrogen mineralization factors are taken from ASAE D384.2 MAR2005 table 1.b sec 3, MWPS 10-1, 10-2, and 10-5, respectively.

The following assumptions apply to all calculations:

Nitrogen uptake for corn is 199 lb/acre

Lagoon Estimated Land Requirement:

Assume organic nitrogen = 25%
Assume ammonia nitrogen = 75%
Storage loss = 80%
Ammonia application loss = 2% (injection)
Organic nitrogen mineralization factor = 0.35

	Nitrogen	
Nitrogen Losses	%	Lb N/yr
Total N		385,590
Available N (80% loss)	20%	77,120
Available Ammonia Nitrogen	75%	57,840
Organic Nitrogen	25%	19,280
Available Ammonia Nitrogen after 2% application loss	98%	56,680
First Year Organic Nitrogen (35% Mineralization)	35%	6,750
Total Available Organic Nitrogen (4 Years Mineralization)	65.6%	12,650
Total Plant Available Annually (After 4 Years)		69,330
Land Required for average corn crop (199 lbs of plant available N/acre)		+/- 350

Total Estimated Land Required for Application:

Total = 350 Acres +/-
Total Available acres in Plan = 2204 Spreadable acres

d. Conservation Alternatives Considered – N/A

e. Proposed Waste Storage and Treatment Conservation Practices - None

f. Waste System Narrative(s)

Mount Erie (4088)
Manure from the existing tanks/pits will be pumped to the existing treatment lagoon as needed. Manure from the lagoon will be transferred to land application fields by drag hose and injected for waste utilization (approximately every 6 months).

Lakeview (4089/4093)
Manure from the existing tanks/pits will be pumped to the existing treatment lagoon stage 1 cell as needed. the existing treatment lagoon stage 1 cell gravity flows to the Stage 2 Cell. Manure from the stage 1 & 2 treatment lagoons will be transferred to land application fields by drag hose and injected for waste utilization (approximately every 6 months). Some liquid from the stage 2 cell is pumped back into the Stage 1 cell to recharge the lagoon after land application.

Elm River (4090)
Manure from the existing tanks/pits will be pumped to the existing lagoon as needed. Manure from the lagoon will be transferred to land application fields by drag hose and injected for waste utilization (approximately every 6 months).

Little Wabash (4091/4391)
Manure from the existing tanks/pits will be pumped to the existing treatment lagoon stage 1 cell as needed. The existing treatment lagoon stage 1 cell gravity flows to the Stage 2 Cell. Manure from the stage 1 & 2 treatment lagoons will be transferred to land application fields by drag hose and injected for waste utilization (approximately every 6 months). Some liquid from the stage 2 cell is pumped back into the Stage 1 cell to recharge the lagoon after land application.

Lakeside (4092)
Manure from the existing tanks/pits will be pumped to the existing lagoon as needed. Manure from the lagoon will be transferred to land application fields by drag hose and injected for waste utilization (approximately every 6 months).

2.4. Animal Inventory.

Facility	Nursery	Gest. Gilts	Gest. Sows	Lact Sows	Boars	Wean-Finish
Mt. Erie 4088	3640	0	1459	364	4	0
Lakeview 4089/4093	3640	0	1494	364	4	0
Elm River 4090	3640	0	1298	364	4	0
Little Wabash 4091/4391	3840	0	1391	384	4	0
Lakeside 4092	0	1600	0	0	20	5400
Total	14760	1600	5642	1476	36	5400

a-h: See attached existing Maurer-Stutz, Inc. Animal Waste Management calculations for more detail.

PRELIMINARY

0 300' 1000'
BAR SCALE IN FEET

SCALE VALID ONLY ON 22"x34" SIZE PLANS

CLIENT:	MURPHY-BROWN, LLC.
SHEET TITLE:	MT. ERIE SOW FARM - OVERALL
PROJECT:	MT. ERIE SOW FARM
DESIGNED BY:	DNF
REVIEWED BY:	TJF
DATE:	2021
PROJECT NO.:	23804009.11
SHEET:	C101

MAURER-STUTZ
ENGINEERS SURVEYORS

MURPHY-BROWN, LLC. NMP
PREPARED WITH ASSISTANCE FROM USDA-NRCS
ASSISTED BY: DANIEL N. FEUCHT
WAYNE COUNTY SOIL & WATER CONSERVATION DISTRICT
WAYNE COUNTY, ILLINOIS

LEGEND

- SAN — GRAVITY MANURE TRANSFER PIPE
- FM — PRESSURE MANURE TRANSFER PIPE
- (AE) — AERIAL ELECTRIC LINE
- W — WATER LINE

N

0 200' 400'

BAR SCALE IN FEET

LAKE SIDE

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
LS1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS5	EXISTING SWINE BUILDING W/2' SHALLOW PIT
LS6	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS7	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS8	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS9	MORTALITY COMPOSTER
LS10	EARTHEN LAGOON
LS11	RECEPTION SUMP LIFT STATION (6'ø)
LS12	RECEPTION SUMP LIFT STATION (7'ø)
LS13	OFFICE
LS14	RECYCLE LIFT STATION (6'ø)

LITTLE WABASH

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
LW1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW5	EXISTING SWINE BUILDING W/2' SHALLOW PIT
LW6	OFFICE
LW7	GENERATOR BUILDING
LW8	EARTHEN LAGOON (CELL A)
LW9	EARTHEN LAGOON (CELL B)
LW10	RECEPTION SUMP LIFT STATION (6'ø)
LW11	RECYCLE LIFT STATION (6'ø)

LAKEVIEW

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
LV1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV5	EARTHEN LAGOON (CELL A)
LV6	EARTHEN LAGOON (CELL B)
LV7	RECEPTION SUMP LIFT STATION (6'ø)
LV8	RECYCLE LIFT STATION (8'ø)
LV9	OFFICE
LV10	BOAR ISOLATION W/ 9" SHALLOW PIT
LV11	DEPOT - LOAD/UNLOAD
LV12	OFFICE

PRELIMINARY

SCALE VALID ONLY ON 22"x34" SIZE PLANS

MURPHY-BROWN, LLC. NMP
PREPARED WITH ASSISTANCE
FROM USDA-NRCS
ASSISTED BY: DANIEL N. FEUCHT
WAYNE COUNTY SOIL & WATER
CONSERVATION DISTRICT
WAYNE COUNTY, ILLINOIS

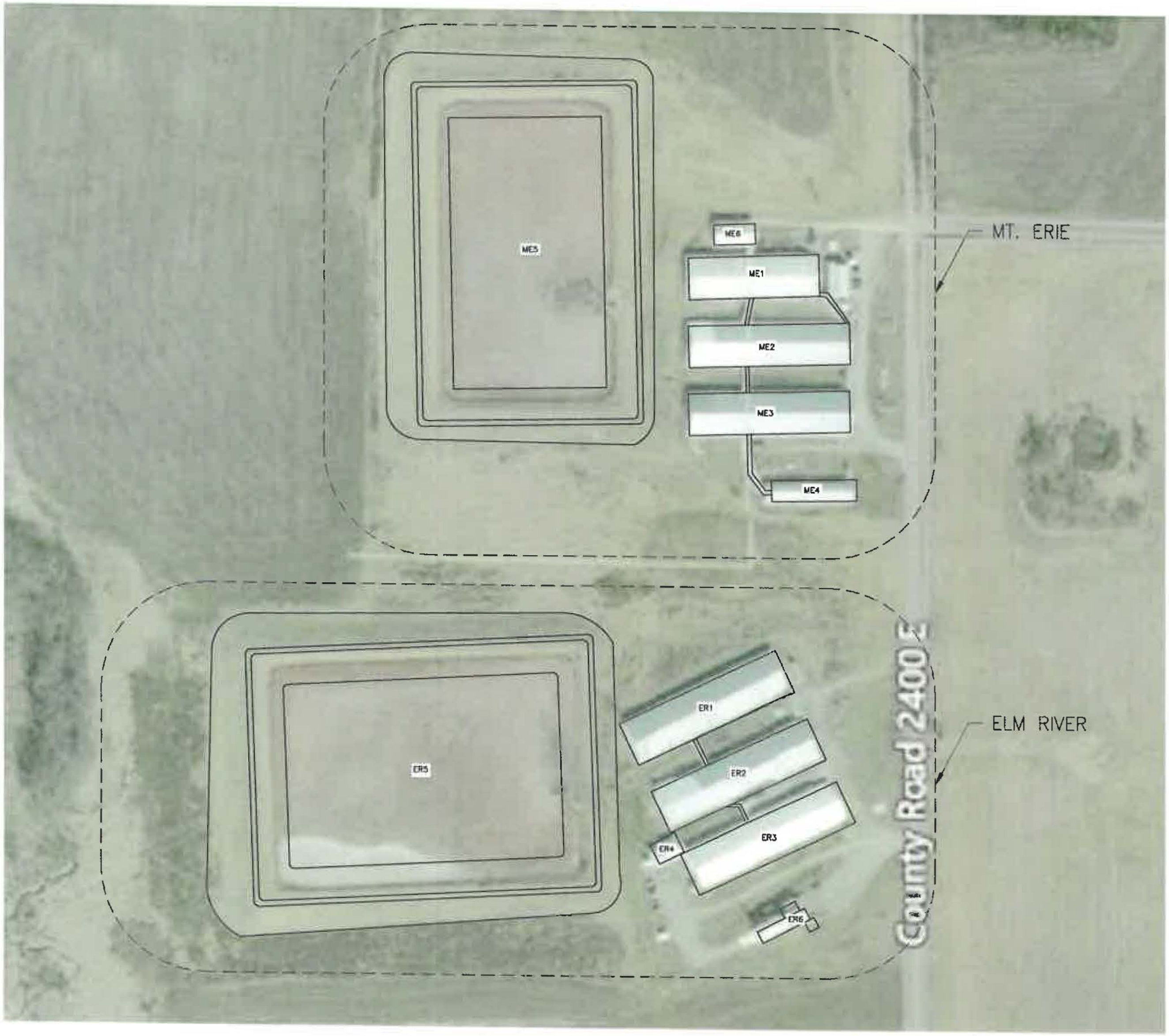
MAURER-STUTZ
ENGINEERS SURVEYORS

SHEET TITLE: SITE PLAN

PROJECT: MT. ERIE SOW FARM

CLIENT: MURPHY-BROWN, LLC.

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C102A



MT. ERIE

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
ME1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME5	EARTHEN LAGOON
ME6	SWINE BUILDING

ELM RIVER

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
ER1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ER2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ER3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ER5	EARTHEN LAGOON
ER6	TRUCK WASH BUILDING
ER4	OFFICE

LEGEND

- GAN — GRAVITY MANURE TRANSFER PIPE
- PM — PRESSURE MANURE TRANSFER PIPE
- AC — AERIAL ELECTRIC LINE
- W — WATER LINE

N

0 100' 200'

BAR SCALE IN FEET

PRELIMINARY

SCALE VALID ONLY ON
22"x34" SIZE PLANS

MURPHY-BROWN, LLC. NMP
PREPARED WITH ASSISTANCE
FROM USDA-NRCS
ASSISTED BY: DANIEL N. FEUCHT
WAYNE COUNTY SOIL & WATER
CONSERVATION DISTRICT
WAYNE COUNTY, ILLINOIS

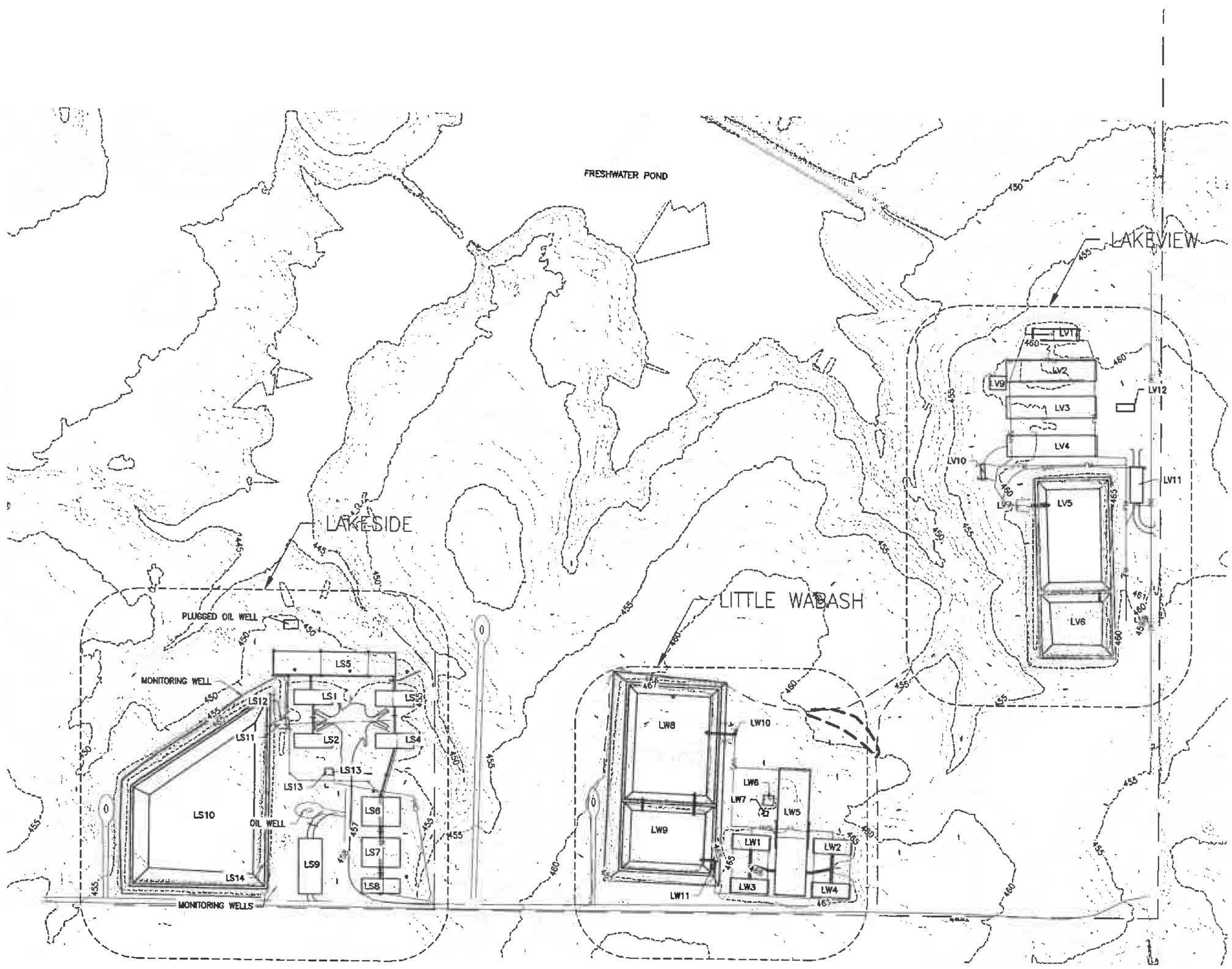
MAURER-STUTZ
ENGINEERS SURVEYORS

SHEET TITLE: SITE PLAN

PROJECT: MT. ERIE SOW FARM

CLIENT: MURPHY-BROWN, LLC.

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C102B



LEGEND

- FLOW ARROW
- EXISTING GROUND CONTOUR
- GRAVITY MANURE TRANSFER PIPE
- PRESSURE MANURE TRANSFER PIPE
- AERIAL ELECTRIC LINE
- WATER LINE

PRELIMINARY

N

200' 400'

BAR SCALE IN FEET

SCALE VALID ONLY ON 22"x34" SIZE PLANS

MURPHY–BROWN, LLC. NMP PREPARED WITH ASSISTANCE FROM USDA–NRCS
ASSISTED BY: DANIEL N. FEUCHT
WAYNE COUNTY SOIL & WATER CONSERVATION DISTRICT
WAYNE COUNTY, ILLINOIS

MAURER-STUTZ
ENGINEERS SURVEYORS
PEORIA, IL 3116 N DRIES LANE, SUITE 100 | PEORIA, IL 61604 | (309) 693-7615 | FAX (309) 693-7616
CANTON, IL 1670 EAST ASH STREET | CANTON, IL 61520 | (309) 647-7831 | FAX (309) 647-8155
MUNCIE, IN 5830 W KILGORE AVENUE | MUNCIE, IN 47304 | (765) 273-6228 | FAX (309) 693-7616
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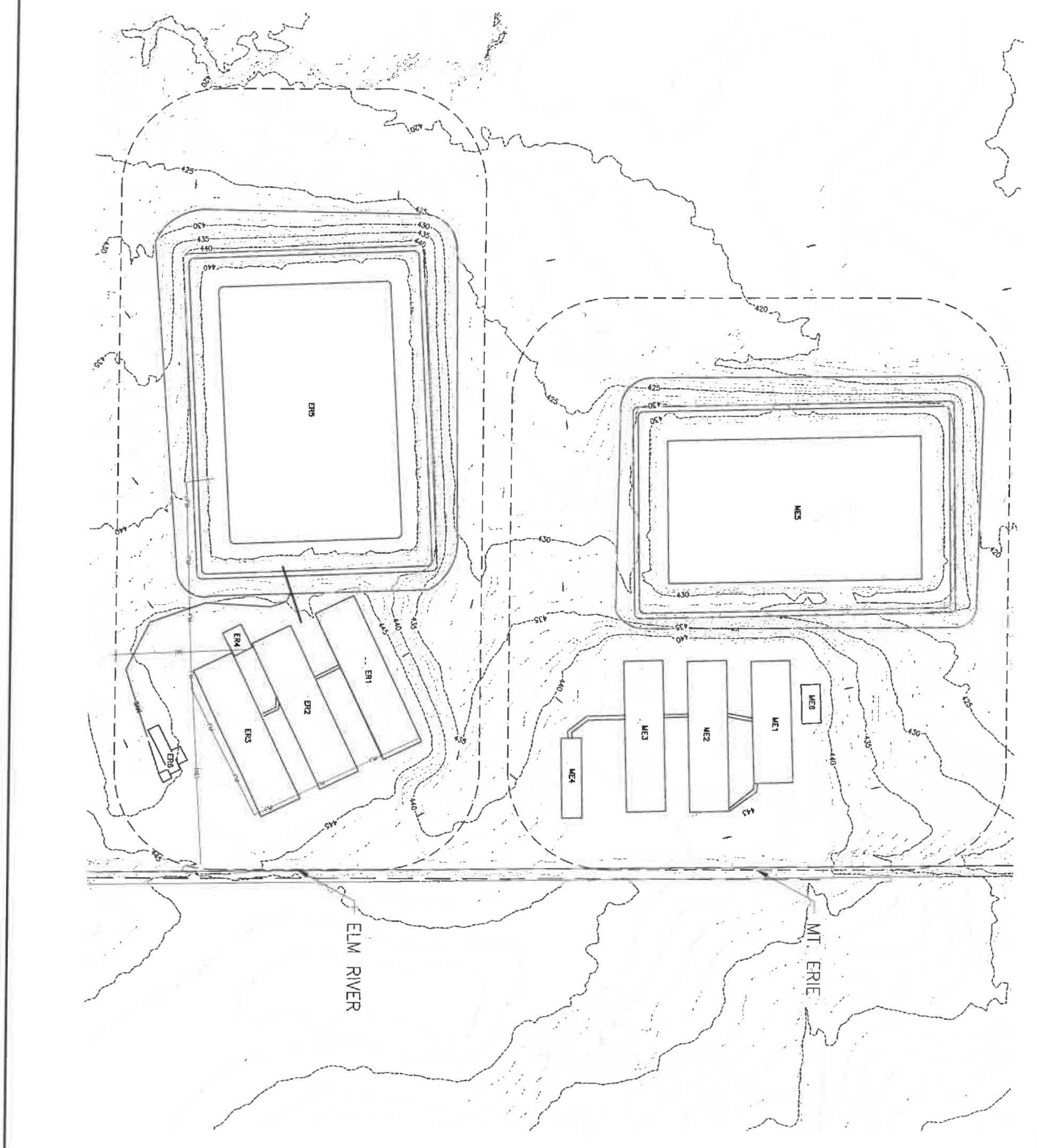
www.mstutz.com "WORKING with YOU by DESIGN"

SHEET TITLE: **GRADING PLAN**

PROJECT: MT. ERIE SOW FARM

CLIENT: **MURPHY-BROWN, LLC.**

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C103A



LEGEND

FLOW ARROW
95 EXISTING GROUND CONTOUR
SAN GRAVITY MANURE TRANSFER PIPE
PRESSURE MANURE TRANSFER PIPE
AE AERIAL ELECTRIC LINE
W WATER LINE

0 100' 200'
BAR SCALE IN FEET

N

PRELIMINARY

SCALE VALID ONLY ON
22"x34" SIZE PLANS

CLIENT: MURPHY-BROWN, LLC.	SHEET TITLE: GRADING PLAN	MAURER-STUTZ ENGINEERS SURVEYORS	MURPHY-BROWN, LLC. NMP PREPARED WITH ASSISTANCE FROM USDA-NRCS ASSISTED BY: DANIEL N. FEUCHT WAYNE COUNTY SOIL & WATER CONSERVATION DISTRICT WAYNE COUNTY, ILLINOIS
	PROJECT: MT. ERIE SOW FARM		

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C103B

SECTION 2
LAKESIDE CALCULATIONS

LAKE SIDE

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
LS1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS5	EXISTING SWINE BUILDING W/2' SHALLOW PIT
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LS7	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS8	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS9	MORTALITY COMPOSTER
LS10	EARTHEN LAGOON
LS11	RECEPTION SUMP LIFT STATION (6'ø)
LS12	RECEPTION SUMP LIFT STATION (7'ø)
LS13	OFFICE
LS14	RECYCLE LIFT STATION (6'ø)

LEGEND

SAN — GRAVITY MANURE TRANSFER PIPE
FM — PRESSURE MANURE TRANSFER PIPE
OHE — AERIAL ELECTRIC LINE
WL — WATER LINE

PRELIMINARY

0 50' 100'
BAR SCALE IN FEET

SCALE VALID ONLY ON 22"x34" SIZE PLANS

MURPHY-BROWN, LLC. NMP PREPARED WITH ASSISTANCE FROM USDA-NRCS
ASSISTED BY: DANIEL N. FEUCHT
WAYNE COUNTY SOIL & WATER CONSERVATION DISTRICT
WAYNE COUNTY, ILLINOIS

MAURER-STUTZ
ENGINEERS SURVEYORS

SHEET TITLE: SITE PLAN - LAKESIDE

PROJECT: MT. ERIE SOW FARM

CLIENT: MURPHY-BROWN, LLC.

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C104A

MAURER-STUTZ

ENGINEERS SURVEYORS

PROJECT: Murphy-Brown, LLC. - Lakeside

PROJECT NO.: 23804009.11

COMPUTATION BY: DNF DATE: 1/9/23

CHECKED BY: DATE:

Inputs:

- Facility Animals & Loactions
- Additional Animal Waste Inputs
- 25 YR Storm Event Inputs
- 50 YR Storm Event Inputs
- Silage Leachate
- Dairy Waste Water Inputs
- Swine Waste Water Inputs

Outputs:

- Facility Storage Volumes
- Nutrients As Excreted

Storages:

- Holding Pond 1
- Holding Pond 2
- Holding Pond 3
- Holding Pond 4
- Holding Pond 5
- Uncovered Stacks
- Covered Stacks
- Rectangular Tanks
- Circular Tanks 1-2
- Circular Tanks 3-4
- Settling Basin 1
- Settling Basin 2

v.14.2

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeside
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: ______ DATE: ______ OF: 1

Subject: *Facility Animals & Locations*

	Animal Data												
		Actual		210-AWMFH - Ch 4									NRCS AU
		Quantity	Weight	Manure	Weight	Manure	Manure	VS		TS			
	Animals	hd	lbs	cf/d-a	lbs	cf/d/AU	CF/day	lbs/d/AU	lbs/day	lbs/d/AU	lbs/day		
1	Swine W/F W/D	5400	135	0.14	138	1.01	739.6	5.40	3936.6	6.50	4738.5		729.0
2	Swine Gest. Gilt	1600	300	0.14	350	0.41	197.5	2.30	1104.0	2.50	1200.0		480.0
3	Swine Boar	20	325	0.13	440	0.30	1.9	1.70	11.1	1.90	12.4		6.5
4				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0		0.0
5				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0		0.0
6				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0		0.0
7				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0		0.0
8				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0		0.0
9				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0		0.0
	Total	7020					939		5052		5951		1216

Rainfall Data	
County, State	Wayne, Illinois
Precip for storage period	42.7 in
Annual Lake Evap	[illegible]
% Evap for storage period	100%
1 Yr 2 Hr Storm Event	1.55 in
2 Yr 24 Hr Storm Event	3.16 in
25 Yr 24 Hr Storm Event	5.8 in
Storage Period	12.0 Months

VS Loading Rate	4.00 lb/d*1000 CF
ODOR Loading Rate	2.46 lb/d*1000 CF

Rainfall Data (Indiana Only)	
Location	Wayne, Illinois
50 Yr 24 Hr Storm Event	6.7 in
IDEM 50 Yr 24 Hr Storm	6.0 in
Greater of Storm Events	6.7 in

	Location Data							
	Animals	Holding Pond	Covered Stack	Uncovered Stack	Rect. Tank	Circular Tank	Pasture	Settling Basin
		Cell A						
1	Swine W/F W/D	100%						
2	Swine Gest. Gilt	100%						
3	Swine Boar	100%						
4								
5								
6								
7								
8								
9								
	Parlor							
	Sprinkler							
	Waters							
	Other							
	Solid Removal							
	Lagoon treat							
	Silage leachate							
	Runoff							
	25Y Runoff							
	Solid Stored							
	Wash Water	100%						
	Flush Water							
	Bedding							
	50Y Runoff							

*Values calculated above are based on data from the USDA-NRCS 210-AWMFH Chapter 4 March 2008

MAURER-STUTZ

Subject: Facility Waste Volumes

PROJECT: Murphy Brown, LLC. - Lakeside
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Facility Volumes (CF/day)

	Holding Pond					Covered Stack				
Facility	Cell A	0	0	0	0	0%	0	0%	0	0
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	938.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	34.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	973.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	355417	0	0	0	0	0	0	0	0	0
Density lb/cf	0	0	0	0	0	50	50	50	50	50
Annual Tons	0	0	0	0	0	0	0	0	0	0
Annual Gal	2.66E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0
# LOADS	4430	0	0	0	0	0	0	0	0	0
TIME	74	0	0	0	0	0	0	0	0	0

	Uncovered Stack					Rect. Tank							
Facility	0	0	0	0	0	0	0	0	0	0	0	0	0
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	0	0	0	0	0	0	0	0	0	0	0	0	0
Density lb/cf	60	60	60	60	60	0	0	0	0	0	0	0	0
Annual Tons	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Gal	0	0	0	0	0	0	0	0	0	0	0	0	0
# LOADS	0	0	0	0	0	0	0	0	0	0	0	0	0
TIME	0	0	0	0	0	0	0	0	0	0	0	0	0

	Circular Tank				Pasture	Settling Basin	
Facility	0	0	0	0	0	0	0
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	0	0	0	0	0	0	0
Density lb/cf	0	0	0	0	0	0	0
Annual Tons	0	0	0	0	0	0	0
Annual Gal	0	0	0	0	0	0	0
# LOADS	0	0	0	0	0	0	0
TIME	0	0	0	0	0	0	0

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF/d	939.0	34.8	0.0	0.0	0.0	0.0	0.0	973.7

Annual Manure & Wates Water Volumes

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF	342725	12692	0	0	0	0	0	355417

Storage Volumes (CF/Period)

	Holding Pond					Covered Stack				
Storage	Cell A	0	0	0	0	0%	0	0%	0	0
Period (M)	12.00									
Period (D)	365	0	0	0	0	0	0	0	0	0
Required Vol										
CF	355417	0	0	0	0	0	0	0	0	0
GALLONS	2657452	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0
Designed Vol										
CF	405466	0	0	0	0	0	0	0	0	0
GALLONS	3031671	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0
Extra										
CF	50049	0	0	0	0	0	0	0	0	0
GALLONS	374219	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0

	Uncovered Stack					Rect. Tank							
Storage	0	0	0	0	0	0	0	0	0	0	0	0	0
Period (M)													
Period (D)	0	0	0	0	0	0	0	0	0	0	0	0	0
Required Vol													
CF	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0
Designed Vol													
CF	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0
Extra													
CF	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0

	Circular Tank				Pasture	Settling Basin	
Storage	0	0	0	0	0	0	0
Period (M)							
Period (D)	0	0	0	0	0	0	0
Required Vol							
CF	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0
Designed Vol							
CF	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0
Extra							
CF	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0

Storage Volumes	Required Vol CF	Required Vol GALLONS	Designed Vol CF	Designed Vol GALLONS	Extra CF
Total	355417	2657452	405466	3031671	50049

	AVAILABLE	REQUIRED
PASTURE 1 ACRES		0.0 ac

(FIGURES 0.25 IN COVER ON ENTIRE PASTURE)

Annual Storage Volumes Hauled		
Type	UNITS	Volume
LIQUID	GAL	4,053,918
SOLID	TONS	0

(MANURE & PRECIP)

APPLICATION INFROMATION					
TYPE	SIZE	UNITS	LOAD/HR	# LOADS	TIME
LIQUID	600	GAL	60	4430	74
SOLID	400	bu	2	0	0

Storage Volumes (CF/Period)

	Holding Pond					Covered Stack				
Storage	Cell A	0	0	0	0	0%	0	0%	0	0
Working	355416.81	0	0	0	0	0	0	0	0	0
24 hr runoff	0	0	0	0	0	-	-	-	-	-
24 hr storm	117450.15	0	0	0	0	-	-	-	-	-
Precip	186768.34	0	0	0	0	-	-	-	-	-
Treatment	1262917.1	0	0	0	0	-	-	-	-	-
Residuals	316695.79	0	0	0	0	-	-	-	-	-
Freeboard	457656	0	0	0	0	-	-	-	-	-
Total	2746968	0	0	0	0	0	0	0	0	0
Gal to Haul	4053918.4	0	0	0	0	-	-	-	-	-
Tons to Haul	-	-	-	-	-	0	0	0	0	0
Annual gal	4053918.4	0	0	0	0					
Annual tons						0	0	0	0	0

	Uncovered Stack					Rect. Tank							
Storage	0	0	0	0	0	0	0	0	0	0	0	0	0
Working	0	0	0	0	0	0	0	0	0	0	0	0	0
24 hr runoff	-	-	-	-	-	0	0	0	0	0	0	0	0
24 hr storm	-	-	-	-	-	0	0	0	0	0	0	0	0
Precip	-	-	-	-	-	0	0	0	0	0	0	0	0
Treatment	-	-	-	-	-	-	-	-	-	-	-	-	-
Residuals	-	-	-	-	-	0	0	0	0	0	0	0	0
Freeboard	-	-	-	-	-	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Gal to Haul	-	-	-	-	-	0	0	0	0	0	0	0	0
Tons to Haul	0	0	0	0	0	-	-	-	-	-	-	-	-
Annual gal						0	0	0	0	0	0	0	0
Annual tons	0	0	0	0	0								

	Circular Tank				Pasture	Settling Basin	
Storage	0	0	0	0	0	0	0
Working	0	0	0	0	0	0	0
24 hr runoff	0	0	0	0			
24 hr storm	0	0	0	0			
Precip	0	0	0	0			
Treatment	-	-	-	-	-	-	-
Residuals	0	0	0	0			
Freeboard	0	0	0	0			
Total	0	0	0	0			
Gal to Haul	0	0	0	0	-		
Tons to Haul	-	-	-	-	0	0	0
Annual gal	0	0	0	0			
Annual tons					0	0	0

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeside
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Additional Waste Produced

Additions Data

Animals	Wash Gal/day	Flush Gal/day	Bedding Type	Rate lbs/d/A	Amount lbs/day	Density lb/CF	Amount CF/day
Swine W/F W/D	180				0	0	0.00
Swine Gest. Gilt	65				0	0	0.00
Swine Boar*	15				0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
Parlor**						0	0.00
Sprinkler**	0					0	0.00
Waters**	0					0	0.00
Other**						0	0.00
Total	260				0		0.00

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

S:\238\2004 project numbers\23804009.11(Smithfield-NMP Updates)\AWM\2023\4092 Lakeside MSI
AWM 2010 v14.2

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeside
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: 25yr Runoff Calculations

Normal Runoff

Area = | Area = | Area =

	Concrete (CN=97)				Earth (CN=90)				Roof (CN=100)			
	Months	R	P	Total CF	Months	R	P	Total CF	Months	R	P	Total CF
X	JAN	0	2.47	0	JAN	0	2.47	0	JAN	100	2.5	0
X	FEB	0	2.57	0	FEB	0	2.57	0	FEB	100	2.6	0
X	MAR	0	4.01	0	MAR	0	4.01	0	MAR	100	4	0
X	APR	0	4.19	0	April	0	4.19	0	April	100	4.2	0
X	May	0	4.23	0	May	0	4.23	0	May	100	4.2	0
X	June	0	3.92	0	June	0	3.92	0	June	100	3.9	0
X	July	0	3.89	0	July	0	3.89	0	July	100	3.9	0
X	AUG	0	3.66	0	AUG	0	3.66	0	AUG	100	3.7	0
X	SEPT	0	3.22	0	SEPT	0	3.22	0	SEPT	100	3.2	0
X	OCT	0	3.12	0	OCT	0	3.12	0	OCT	100	3.1	0
X	NOV	0	4.19	0	NOV	0	4.19	0	NOV	100	4.2	0
X	DEC	0	3.22	0	DEC	0	3.22	0	DEC	100	3.2	0
	Total		42.7	0	Total			0	Total			0

Net Normal Ruoff = 0 CF

25 YR - 24HR Storm Event

Concrete (CN=97)			Earth (CN=90)			Roof (CN=100)		
CN	97		CN	90		CN	100	
S	0.31	in	S	1.11	in	S	0.00	in
I_{25}	5.79	in	I_{25}	5.79	in	I_{25}	5.79	in
Q_{25}	5.43	in	Q_{25}	4.64	in	Q_{25}	5.79	in
Vol_{25}	0.00	CF	Vol_{25}	0.00	CF	Vol_{25}	0.00	CF

25yr Storm Event Runoff = 0 CF

Notes

Concrete Areas: | Earthen Areas: | Roofed Areas:

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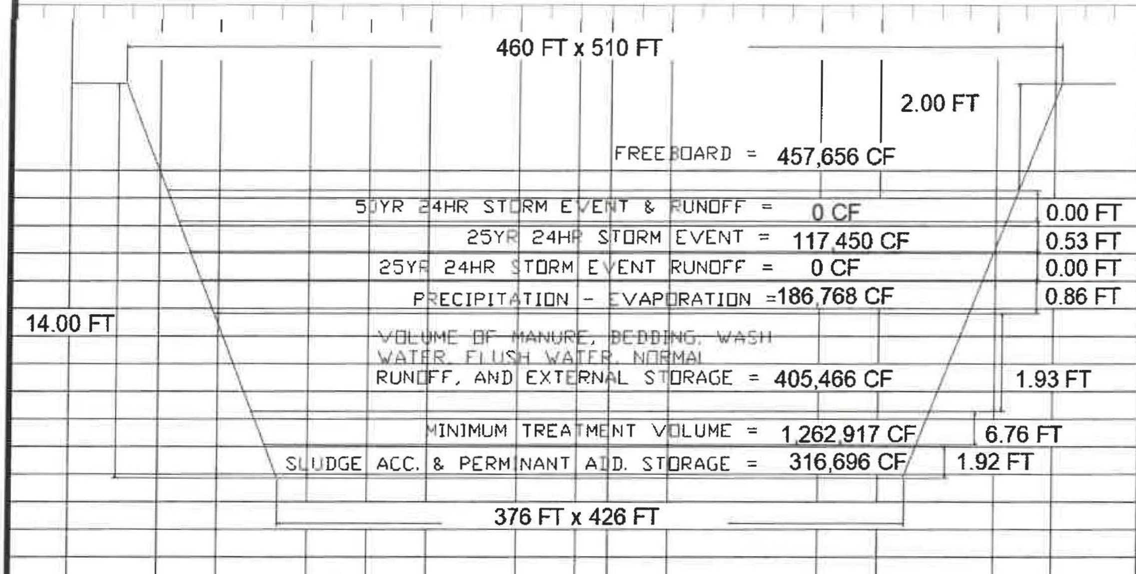
AWM 2010 v14.2

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeside
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Lagoon 1 Design Sheet, Cell A



EARTHEN STORAGE

TOTAL DEPTH	14.00 FT
FREEBOARD	2.00 FT
RESIDUAL SOLIDS	1.92 FT
MINIMUM TREATMENT	6.76 FT
PRECIP-EVAP DEPTH	0.86 FT
25 YR, 24-HR Runoff V	0 CF
25 YR, 24-HR Runoff D	0.00 FT
25 YR, 24-HR EFF	0.53 FT
50 YR, 24-HR Runoff V	0 CF
WORKING DEPTH	1.93 FT

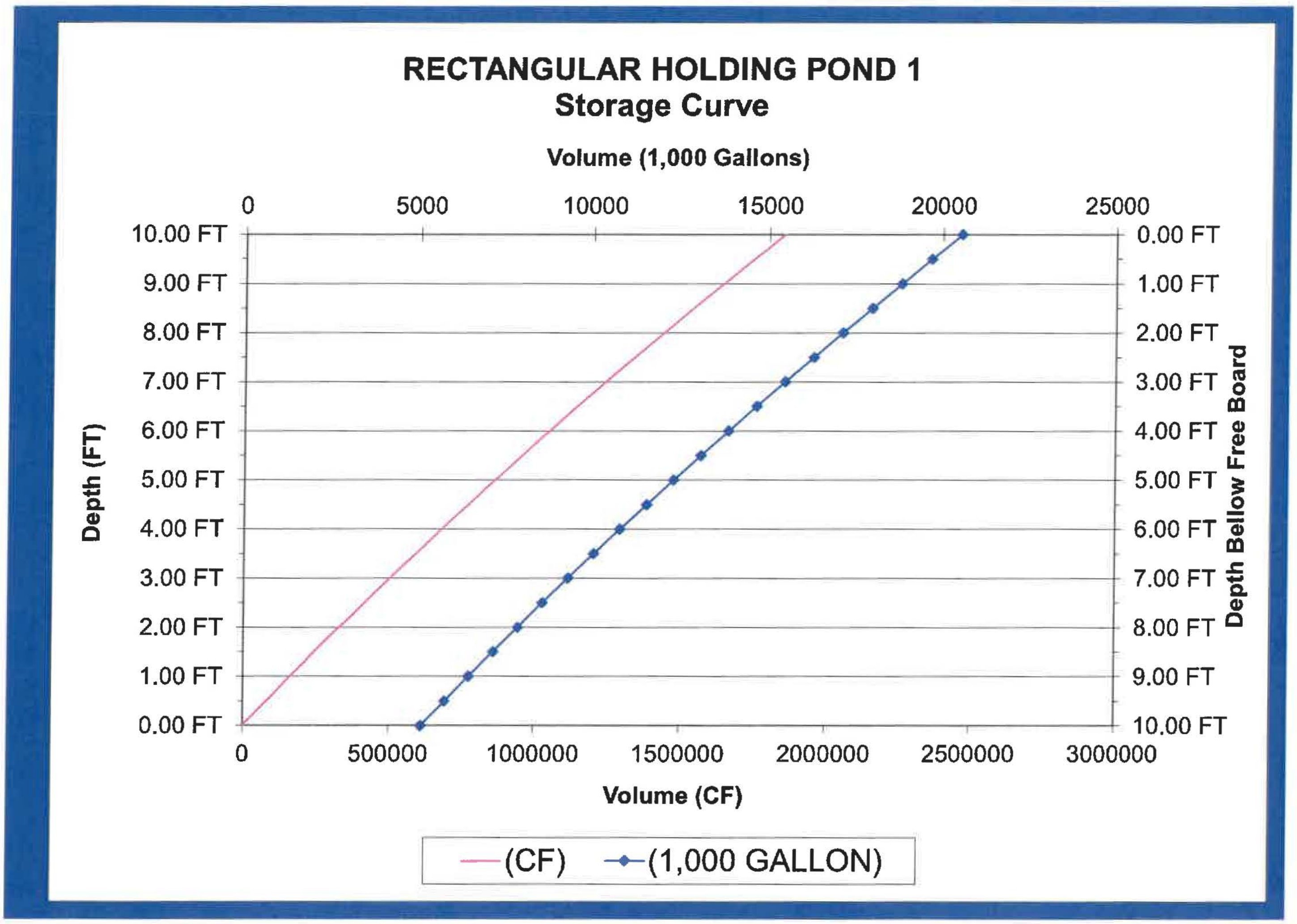
Deminsions	
BOTTOM WIDTH	376 FT
BOTTOM LENGTH	426 FT
INSIDE SLOPE	3.0 FT
TOP WIDTH	460 FT
TOP LENGTH	510 FT
START PUMPING	
STOP PUMPING	

50 YR, 24-HR VOL	0 CF	≈	0.00 MG
25 YR, 24-HR VOL	117,450 CF	≈	0.88 MG
PRECIP-EVAP VOL	186,768 CF	≈	1.40 MG
WORKING VOLUME	405,466 CF	≈	3.03 MG
MINIMUM TREATMENT	1,262,917 CF	≈	9.44 MG
RESIDUAL SOLIDS	316,696 CF	≈	2.37 MG
TOTAL RAMP VOL	0 CF	≈	0.00 MG
FREEBOARD	457,656 CF	≈	3.42 MG
TOTAL VOLUME	2,746,968 CF	≈	20.54 MG

ACTUAL PRECIP	42.7 in
ACTUAL EVAP	36.5 in
25 YR, 24-HR ACT	5.8 in
50 YR, 24-HR ACT	0.0 in

50 YR, 24-HR Runoff D	0.00 FT
50 YR, 24-HR EVENT D	0.00 FT

POND 1 - STAGE STORAGE				
TOTAL DEPTH	VOLUME (CF)	VOLUME (1,000 GALLON)	DEPTH BELOW	VOLUME (1,000 GAL / 1/2 FT)
14.00 FT	2746968	20539	0.00 FT	0.0
13.50 FT	2630394	19667	0.50 FT	871.6
13.00 FT	2515266	18807	1.00 FT	860.8
12.50 FT	2401575	17957	1.50 FT	850.1
12.00 FT	2289312	17117	2.00 FT	839.4
11.50 FT	2178468	16288	2.50 FT	828.8
11.00 FT	2069034	15470	3.00 FT	818.2
10.50 FT	1961001	14662	3.50 FT	807.8
10.00 FT	1854360	13865	4.00 FT	797.4
9.50 FT	1749102	13078	4.50 FT	787.0
9.00 FT	1645218	12301	5.00 FT	776.7
8.50 FT	1542699	11535	5.50 FT	766.5
8.00 FT	1441536	10778	6.00 FT	756.4
7.50 FT	1341720	10032	6.50 FT	746.3
7.00 FT	1243242	9296	7.00 FT	736.3
6.50 FT	1146093	8569	7.50 FT	726.4
6.00 FT	1050264	7853	8.00 FT	716.5
5.50 FT	955746	7146	8.50 FT	706.7
5.00 FT	862530	6449	9.00 FT	697.0
4.50 FT	770607	5762	9.50 FT	687.3
4.00 FT	679968	5084	10.00 FT	677.7
3.50 FT	590604	4416	10.50 FT	668.2
3.00 FT	502506	3757	11.00 FT	658.7
2.50 FT	415665	3108	11.50 FT	649.3
2.00 FT	330072	2468	12.00 FT	640.0
1.50 FT	245718	1837	12.50 FT	630.7
1.00 FT	162594	1216	13.00 FT	621.5
0.50 FT	80691	603	13.50 FT	612.4
0.00 FT	0	0	14.00 FT	603.3
0.00 FT	0	0	14.00 FT	0.0
0.00 FT	0	0	14.00 FT	0.0
0.00 FT	0	0	14.00 FT	0.0


RECTANGULAR HOLDING POND 1
Storage Curve
Volume (1,000 Gallons)
0
5000
10000
15000
20000
25000
10.00 FT
9.00 FT
8.00 FT
7.00 FT
6.00 FT
5.00 FT
4.00 FT
3.00 FT
2.00 FT
1.00 FT
0.00 FT
Depth (FT)
0.00 FT
1.00 FT
2.00 FT
3.00 FT
4.00 FT
5.00 FT
6.00 FT
7.00 FT
8.00 FT
9.00 FT
10.00 FT
Depth Bellow Free Board
0
500000
1000000
1500000
2000000
2500000
3000000
Volume (CF)
(CF)
(1,000 GALLON)

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeside
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: NUTRIENTS AS EXCRETED

Liquid Manure							
				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine W/F W/D*	100%	5400	135	269.7		200.3	141.1
Swine Gest. Gilt*	100%	1600	300	76.8		55.0	63.9
Swine Boar*	100%	20	325	0.9		0.7	0.7
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				347	0	256	206

Solid Manure							
				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine W/F W/D*	0%	5400	135	0.0		0.0	0.0
Swine Gest. Gilt*	0%	1600	300	0.0		0.0	0.0
Swine Boar*	0%	20	325	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				0	0	0	0

Solid Totals (lbs)		lb/ton
N	0	#DIV/0!
P2O5	0	#DIV/0!
K2O	0	#DIV/0!

Liquid Totals (lbs)		lb/1000gal
N	126816	31
P2O5	93452	23
K2O	75092	19

Annual Totals (lbs)	
N	126816
P2O5	93452
K2O	75092

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeside
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Lakeside Water Usage worksheet

Building	Capacity
W-F	5400
gilt	1600
boars	20
	0
	0

type	gpd/hd
cups	0.1
swinging nipples, Edstom	0.2
swinging nipples	0.3
regular nipples, Edstrom	0.4
regular nipples	0.6
wet/dry	0.1

Waterers (place a 1 on which type of waterers)

Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry
W-F						
gilt						
boars						
0						
0						

Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry	**total gpd**
W-F	0	0	0	0	0	0	**0.00**
gilt	0	0	0	0	0	0	**0.00**
boars	0	0	0	0	0	0	**0.00**
0	0	0	0	0	0	0	**0.00**
0	0	0	0	0	0	0	**0.00**

Cleaning				**Presoak**				
Building	pressure washer gpm	cleaning interval weeks	time to clean hrs	time hr	flow gph	sprinklers #	usage gpd	**total gpd**
W-F	10	26	55	0	0	0	0.00	**180.82**
gilt	10	26	20	0	0	0	0.00	**65.75**
boars	10	13	2	0	0	0	0.00	**13.15**
0		1		0	0	0	0.00	**0.00**
0		1		0	0	0	0.00	**0.00**

total	**waterers**	**cleaning**	**total, gpd**	
W-F	0.00	180.82	180.82	70%
gilt	0.00	65.75	65.75	25%
boars	0.00	13.15	13.15	5%
0	0.00	0.00	0.00	0%
0	0.00	0.00	0.00	0%
			259.73	

SECTION 2
LITTLE WABASH CALCULATIONS

LITTLE WABASH

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
LW1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW5	EXISTING SWINE BUILDING W/2' SHALLOW PIT
LW6	OFFICE
LW7	GENERATOR BUILDING
LW8	EARTHEN LAGOON (CELL A)
LW9	EARTHEN LAGOON (CELL B)
LW10	RECEPTION SUMP LIFT STATION (6'ø)
LW11	RECYCLE LIFT STATION (6'ø)

LEGEND

SAN — GRAVITY MANURE TRANSFER PIPE
FM — PRESSURE MANURE TRANSFER PIPE
(AE) — AERIAL ELECTRIC LINE
(W) — WATER LINE

0 50' 100'
BAR SCALE IN FEET

PRELIMINARY

SCALE VALID ONLY ON 22"x34" SIZE PLANS

MURPHY-BROWN, LLC. NMP PREPARED WITH ASSISTANCE FROM USDA-NRCS ASSISTED BY: DANIEL N. FEUCHT WAYNE COUNTY SOIL & WATER CONSERVATION DISTRICT WAYNE COUNTY, ILLINOIS

MAURER-STUTZ ENGINEERS SURVEYORS

SHEET TITLE: SITE PLAN - LITTLE WABASH

PROJECT: MT. ERIE SOW FARM

CLIENT: MURPHY-BROWN, LLC.

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C104B

MAURER-STUTZ

ENGINEERS SURVEYORS

PROJECT: Murphy-Brown, LLC. - Little Wabash

PROJECT NO.: 23804009.11

COMPUTATION BY: DNF DATE: 1/9/23

CHECKED BY: DATE:

Inputs:

Facility Animals & Loactions

Additional Animal Waste Inputs

25 YR Storm Event Inputs

50 YR Storm Event Inputs

Silage Leachate

Dairy Waste Water Inputs

Swine Waste Water Inputs

Outputs:

Facility Storage Volumes

Nutrients As Excreted

Storages:

Holding Pond 1

Holding Pond 2

Holding Pond 3

Holding Pond 4

Holding Pond 5

Uncovered Stacks

Covered Stacks

Rectangular Tanks

Circular Tanks 1-2

Circular Tanks 3-4

Settling Basin 1

Settling Basin 2

v.14.2

PROJECT: Murphy-Brown, LLC. - Little Wabash
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: ______ DATE: ______ OF: 1

MAURER-STUTZ

Subject: Facility Animals & Locations

Animal Data

	Animals	Actual Quantity hd	Actual Weight lbs	210-AWMFH - Ch 4 Manure cf/d-a	Weight lbs	Manure cf/d/AU	Manure CF/day	VS lbs/d/AU	VS lbs/day	TS lbs/d/AU	TS lbs/day	NRCS AU
1	Swine Lact. Sow	384	400	0.41	423	0.97	148.9	5.40	829.4	5.90	906.2	153.6
2	Swine Gest. Sow	1391	400	0.18	440	0.41	227.6	2.30	1279.7	2.50	1391.0	556.4
3	Swine Nursery	3840	6	0.04	27.5	1.40	32.3	8.80	202.8	10.00	230.4	23.0
4	Swine Boar	4	325	0.13	440	0.30	0.4	1.70	2.2	1.90	2.5	1.3
5				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
6				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
7				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
8				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
9				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
	Total	5619					409		2314		2530	734

Rainfall Data	
County, State	Wayne, Illinois
Precip for storage period	42.7 in
Annual Lake Evap	35.5 in
% Evap for storage period	100%
1 Yr 2 Hr Storm Event	1.55 in
2 Yr 24 Hr Storm Event	3.16 in
25 Yr 24 Hr Storm Event	5.8 in
Storage Period	12.0 Months

VS Loading Rate	4.00 lb/d*1000 CF
ODOR Loading Rate	2.46 lb/d*1000 CF

Rainfall Data (Indiana Only)	
Location	Wayne, Illinois
50 Yr 24 Hr Storm Event	6.7 in
IDEM 50 Yr 24 Hr Storm	6.0 in
Greater of Storm Events	6.7 in

Location Data

	Animals	Holding Pond E9	Holding Pond E10	Covered Stack	Uncovered Stack	Rect. Tank	Circular Tank	Pasture	Settling Basin
1	Swine Lact. Sow		100%						
2	Swine Gest. Sow		100%						
3	Swine Nursery		100%						
4	Swine Boar		100%						
5									
6									
7									
8									
9									
	Parlor								
	Sprinkler								
	Waters								
	Other								
	Solid Removal								
	Lagoon treat	86%	14%						
	Silage leachate								
	Runoff								
	25Y Runoff								
	Solid Stored								
	Wash Water		100%						
	Flush Water								
	Bedding								
	50Y Runoff								

*Values calculated above are based on data from the USDA-NRCS 210-AWMFH Chapter 4 March 2008

MAURER-STUTZ

Subject: Facility Waste Volumes

PROJECT: Murphy-Brown, LLC. - Little Wabash
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: ______ DATE: ______ OF: 1

Facility Volumes (CF/day)

Facility	Holding Pond: E9	Holding Pond: E10	Holding Pond	Holding Pond	Holding Pond	Covered Stack	Covered Stack	Covered Stack	Covered Stack	Covered Stack
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	0.00	409.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	0.00	92.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	0.00	501.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	0	183019	0	0	0	0	0	0	0	0
Density lb/cf	0	0	0	0	0	50	50	50	50	50
Annual Tons	0	0	0	0	0	0	0	0	0	0
Annual Gal	0.00E+00	1.37E+06	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0
# LOADS	0	2281	0	0	0	0	0	0	0	0
TIME	0	38	0	0	0	0	0	0	0	0

Facility	Uncovered Stack	Uncovered Stack	Uncovered Stack	Uncovered Stack	Uncovered Stack	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	0	0	0	0	0	0	0	0	0	0	0	0	0
Density lb/cf	60	60	60	60	60	0	0	0	0	0	0	0	0
Annual Tons	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Gal	0	0	0	0	0	0	0	0	0	0	0	0	0
# LOADS	0	0	0	0	0	0	0	0	0	0	0	0	0
TIME	0	0	0	0	0	0	0	0	0	0	0	0	0

Facility	Circular Tank	Circular Tank	Circular Tank	Circular Tank	Pasture	Settling Basin	Settling Basin
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	0	0	0	0	0	0	0
Density lb/cf	0	0	0	0	0	0	0
Annual Tons	0	0	0	0	0	0	0
Annual Gal	0	0	0	0	0	0	0
# LOADS	0	0	0	0	0	0	0
TIME	0	0	0	0	0	0	0

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF/d	409.1	92.3	0.0	0.0	0.0	0.0	0.0	501.4

Annual Manure & Wates Water Volumes

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF	149335	33683	0	0	0	0	0	183019

Storage Volumes (CF/Period)

Storage	Holding Pond: E9	Holding Pond: E10	Holding Pond	Holding Pond	Holding Pond	Covered Stack	Covered Stack	Covered Stack	Covered Stack	Covered Stack
Period (M)	12.00	12.00								
Period (D)	365	365	0	0	0	0	0	0	0	0
Required Vol										
CF	0	183019	0	0	0	0	0	0	0	0
GALLONS	0	1368430	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0
Designed Vol										
CF	74044	331924	0	0	0	0	0	0	0	0
GALLONS	553627	2481797	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0
Extra										
CF	74044	148906	0	0	0	0	0	0	0	0
GALLONS	553627	1113367	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0

Storage	Uncovered Stack	Uncovered Stack	Uncovered Stack	Uncovered Stack	Uncovered Stack	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank
Period (M)													
Period (D)	0	0	0	0	0	0	0	0	0	0	0	0	0
Required Vol													
CF	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0
Designed Vol													
CF	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0
Extra													
CF	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0

Storage	Circular Tank	Circular Tank	Circular Tank	Circular Tank	Pasture	Settling Basin	Settling Basin
Period (M)							
Period (D)	0	0	0	0	0	0	0
Required Vol							
CF	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0
Designed Vol							
CF	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0
Extra							
CF	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0

Storage Volumes	Required Vol CF	Required Vol GALLONS	Designed Vol CF	Designed Vol GALLONS	Extra CF
Total	183019	1368430	405968	3035423	222950

	AVAILABLE	REQUIRED
PASTURE 1 ACRES		0.0 ac

(FIGURES 0.25 IN COVER ON ENTIRE PASTURE)

Annual Storage Volumes Hauled		
Type	UNITS	Volume
LIQUID	GAL	2,561,875
SOLID	TONS	0

(MANURE & PRECIP)

APPLICATION INFROMATION					
TYPE	SIZE	UNITS	LOAD/HR	# LOADS	TIME
LIQUID	400	GAL	50	2281	39
SOLID	400	bu	2	0	0

Storage Volumes (CF/Period)

Storage	Holding Pond: E9	Holding Pond: E10	Holding Pond	Holding Pond	Holding Pond	Covered Stack	Covered Stack	Covered Stack	Covered Stack	Covered Stack
Working	0	183018.56	0	0	0	0	0	0	0	0
24 hr runoff	0	0	0	0	0	-	-	-	-	-
24 hr storm	62886.638	37176.143	0	0	0	-	-	-	-	-
Precip	91082.011	68533.554	0	0	0	-	-	-	-	-
Treatment	500217.91	80997.819	0	0	0	-	-	-	-	-
Residuals	308785.87	50271.254	0	0	0	-	-	-	-	-
Freeboard	122099.83	70722.833	0	0	0	-	-	-	-	-
Total	1159123.2	639626.17	0	0	0	0	0	0	0	0
Gal to Haul	681020.2	1880855.1	0	0	0	-	-	-	-	-
Tons to Haul	-	-	-	-	-	0	0	0	0	0
Annual gal	681020.2	1880855.1	0	0	0					
Annual tons						0	0	0	0	0

Storage	Uncovered Stack	Uncovered Stack	Uncovered Stack	Uncovered Stack	Uncovered Stack	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank	Rect. Tank
Working	0	0	0	0	0	0	0	0	0	0	0	0	0
24 hr runoff	-	-	-	-	-	0	0	0	0	0	0	0	0
24 hr storm	-	-	-	-	-	0	0	0	0	0	0	0	0
Precip	-	-	-	-	-	0	0	0	0	0	0	0	0
Treatment	-	-	-	-	-	-	-	-	-	-	-	-	-
Residuals	-	-	-	-	-	0	0	0	0	0	0	0	0
Freeboard	-	-	-	-	-	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Gal to Haul	-	-	-	-	-	0	0	0	0	0	0	0	0
Tons to Haul	0	0	0	0	0	-	-	-	-	-	-	-	-
Annual gal						0	0	0	0	0	0	0	0
Annual tons	0	0	0	0	0								

Storage	Circular Tank	Circular Tank	Circular Tank	Circular Tank	Pasture	Settling Basin	Settling Basin
Working	0	0	0	0	0	0	0
24 hr runoff	0	0	0	0			
24 hr storm	0	0	0	0			
Precip	0	0	0	0			
Treatment	-	-	-	-	-	-	-
Residuals	0	0	0	0			
Freeboard	0	0	0	0			
Total	0	0	0	0			
Gal to Haul	0	0	0	0	-		
Tons to Haul	-	-	-	-	0	0	0
Annual gal	0	0	0	0			
Annual tons					0	0	0

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Little Wabash
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Additional Waste Produced

Additions Data							
			Bedding				
Animals	Wash Gal/day	Flush Gal/day	Type	Rate lbs/d/A	Amount lbs/day	Density lb/CF	Amount CF/day
wine Lact. Sow	410				0	0	0.00
wine Gest. Sov	265				0	0	0.00
Swine Nursery*					0	0	0.00
Swine Boar*	15				0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
Parlor**						0	0.00
Sprinkler**	0					0	0.00
Waters**	0					0	0.00
Other**						0	0.00
Total	690				0		0.00

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

S:\238\2004 project numbers\23804009.11(Smithfield-NMP Updates)\AWM\2023\4091 Little Wabash
MSI AWM 2010 v14.2

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Little Wabash
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: 25yr Runoff Calculations

Normal Runoff

Area = | Area = | Area =

	Concrete (CN=97)				Earth (CN=90)				Roof (CN=100)			
	Months	R	P	Total CF	Months	R	P	Total CF	Months	R	P	Total CF
X	JAN	0	2.47	0	JAN	0	2.47	0	JAN	100	2.5	0
X	FEB	0	2.57	0	FEB	0	2.57	0	FEB	100	2.6	0
X	MAR	0	4.01	0	MAR	0	4.01	0	MAR	100	4	0
X	APR	0	4.19	0	April	0	4.19	0	April	100	4.2	0
X	May	0	4.23	0	May	0	4.23	0	May	100	4.2	0
X	June	0	3.92	0	June	0	3.92	0	June	100	3.9	0
X	July	0	3.89	0	July	0	3.89	0	July	100	3.9	0
X	AUG	0	3.66	0	AUG	0	3.66	0	AUG	100	3.7	0
X	SEPT	0	3.22	0	SEPT	0	3.22	0	SEPT	100	3.2	0
X	OCT	0	3.12	0	OCT	0	3.12	0	OCT	100	3.1	0
X	NOV	0	4.19	0	NOV	0	4.19	0	NOV	100	4.2	0
X	DEC	0	3.22	0	DEC	0	3.22	0	DEC	100	3.2	0
	Total		42.7	0	Total			0	Total			0

Net Normal Ruoff = 0 CF

25 YR - 24HR Storm Event

Concrete (CN=97)			Earth (CN=90)			Roof (CN=100)		
CN	97		CN	90		CN	100	
S	0.31	in	S	1.11	in	S	0.00	in
I_{25}	5.79	in	I_{25}	5.79	in	I_{25}	5.79	in
Q_{25}	5.43	in	Q_{25}	4.64	in	Q_{25}	5.79	in
Vol_{25}	0.00	CF	Vol_{25}	0.00	CF	Vol_{25}	0.00	CF

25yr Storm Event Runoff = 0 CF

Notes

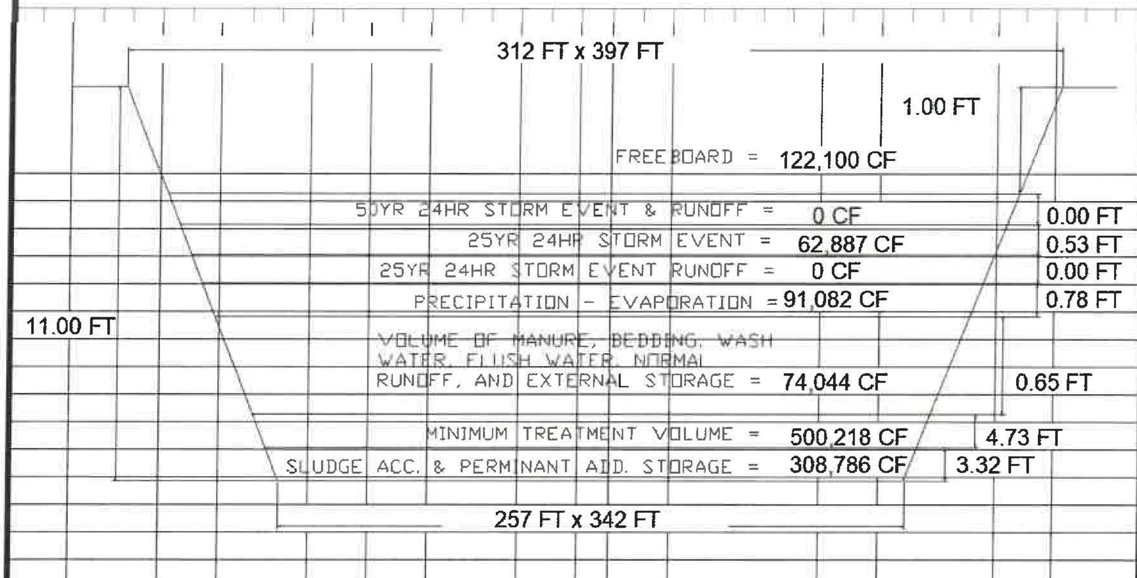
Concrete Areas: Earthen Areas: Roofed Areas:

S:\238\2004 project numbers\23804009.11(Smithfield-NMP Updates)\AWM\2023\4091 Little Wabash
MSI AWM 2010 v14.2

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Little Wabash
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: *Lagoon 1 Design Sheet, E9*



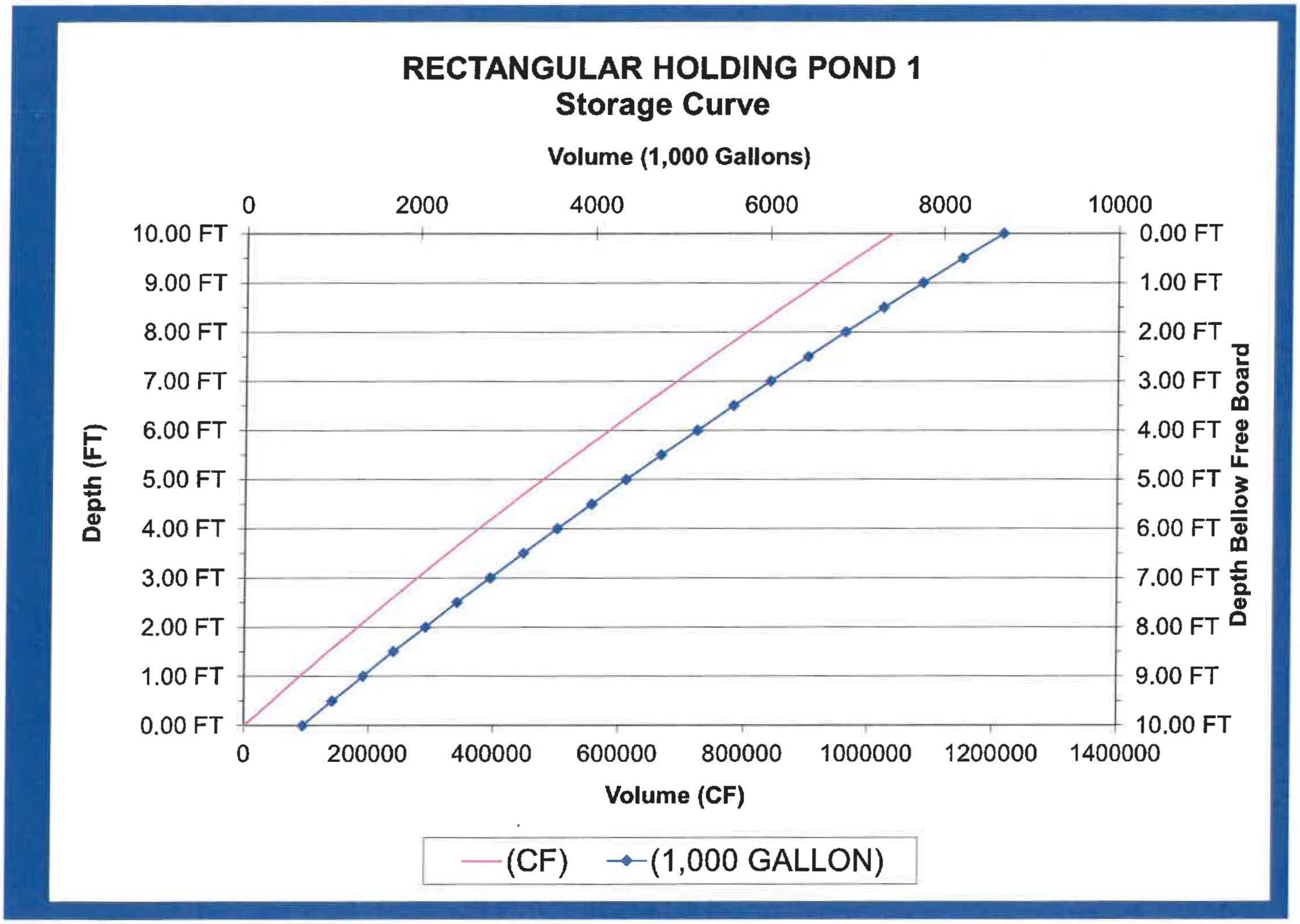
EARTHEN STORAGE

TOTAL DEPTH	11.00 FT
FREEBOARD	1.00 FT
RESIDUAL SOLIDS	3.32 FT
MINIMUM TREATMENT	4.73 FT
PRECIP-EVAP DEPTH	0.78 FT
25 YR, 24-HR Runoff V	0 CF
25 YR, 24-HR Runoff D	0.00 FT
25 YR, 24-HR EFF	0.53 FT
50 YR, 24-HR Runoff V	0 CF
WORKING DEPTH	0.65 FT

50 YR, 24-HR VOL	0 CF	≈	0.00 MG
25 YR, 24-HR VOL	62,887 CF	≈	0.47 MG
PRECIP-EVAP VOL	91,082 CF	≈	0.68 MG
WORKING VOLUME	74,044 CF	≈	0.55 MG
MINIMUM TREATMENT	500,218 CF	≈	3.74 MG
RESIDUAL SOLIDS	308,786 CF	≈	2.31 MG
TOTAL RAMP VOL	0 CF	≈	0.00 MG
FREEBOARD	122,100 CF	≈	0.91 MG
TOTAL VOLUME	1,159,123 CF	≈	8.67 MG

Deminsions	
BOTTOM WIDTH	257 FT
BOTTOM LENGTH	342 FT
INSIDE SLOPE	2.5 FT
TOP WIDTH	312 FT
TOP LENGTH	397 FT
START PUMPING	
STOP PUMPING	
ACTUAL PRECIP	42.7 in
ACTUAL EVAP	36.5 in
25 YR, 24-HR ACT	5.8 in
50 YR, 24-HR ACT	0.0 in
50 YR, 24-HR Runoff D	0.00 FT
50 YR, 24-HR EVENT D	0.00 FT

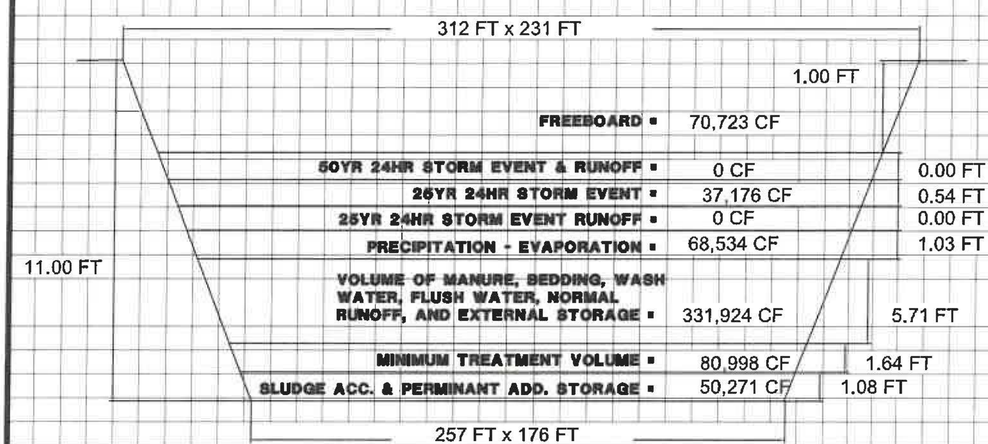
POND 1 - STAGE STORAGE				
TOTAL DEPTH	VOLUME (CF)	VOLUME (1,000 GALLON)	DEPTH BELOW	VOLUME (1,000 GAL / 1/2 FT)
11.00 FT	1159123	8667	0.00 FT	0.0
10.50 FT	1097633	8207	0.50 FT	459.8
10.00 FT	1037023	7754	1.00 FT	453.2
9.50 FT	977287	7307	1.50 FT	446.6
9.00 FT	918419	6867	2.00 FT	440.2
8.50 FT	860411	6433	2.50 FT	433.7
8.00 FT	803259	6006	3.00 FT	427.3
7.50 FT	746955	5585	3.50 FT	421.0
7.00 FT	691494	5170	4.00 FT	414.7
6.50 FT	636869	4762	4.50 FT	408.4
6.00 FT	583074	4360	5.00 FT	402.2
5.50 FT	530103	3964	5.50 FT	396.1
5.00 FT	477949	3574	6.00 FT	390.0
4.50 FT	426607	3190	6.50 FT	383.9
4.00 FT	376069	2812	7.00 FT	377.9
3.50 FT	326331	2440	7.50 FT	371.9
3.00 FT	277385	2074	8.00 FT	366.0
2.50 FT	229225	1714	8.50 FT	360.1
2.00 FT	181845	1360	9.00 FT	354.3
1.50 FT	135239	1011	9.50 FT	348.5
1.00 FT	89400	668	10.00 FT	342.7
0.50 FT	44322	331	10.50 FT	337.0
0.00 FT	0	0	11.00 FT	331.4
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0


RECTANGULAR HOLDING POND 1
Storage Curve
Volume (1,000 Gallons)
0
2000
4000
6000
8000
10000
10.00 FT
9.00 FT
8.00 FT
7.00 FT
6.00 FT
5.00 FT
4.00 FT
3.00 FT
2.00 FT
1.00 FT
0.00 FT
Depth (FT)
0.00 FT
1.00 FT
2.00 FT
3.00 FT
4.00 FT
5.00 FT
6.00 FT
7.00 FT
8.00 FT
9.00 FT
10.00 FT
Depth Bellow Free Board
0
200000
400000
600000
800000
1000000
1200000
1400000
Volume (CF)
(CF)
(1,000 GALLON)

MAURER-STUTZ

PROJECT: *Murphy-Brown, LLC. - Little Wabash*
PROJECT NO.: *23804009.11*
COMPUTATION BY: *DNF* DATE: *1/9/23* SH. NO.: *1*
CHECKED BY: ______ DATE: ______ OF: *1*

Subject: *Lagoon 2 Design Sheet, E10*



EARTHEN STORAGE

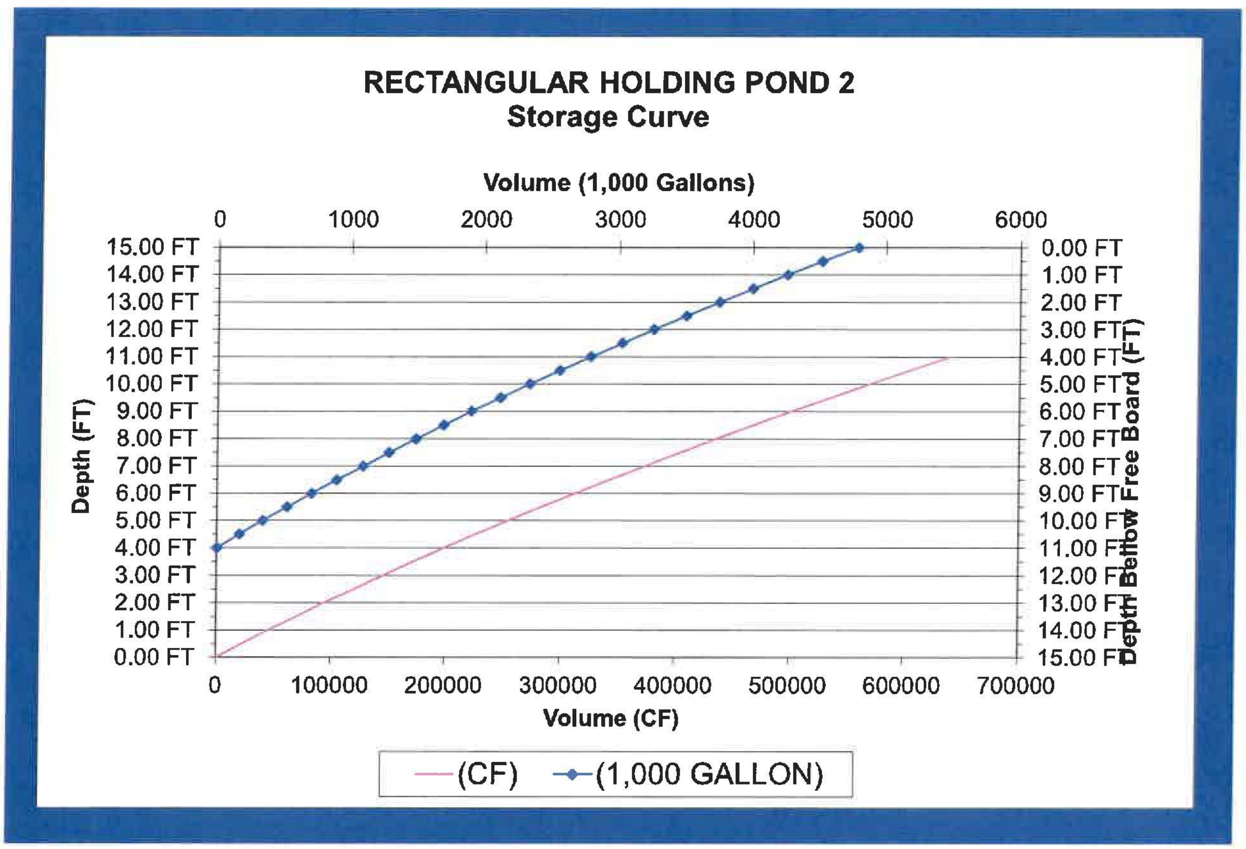
TOTAL DEPTH	11.00 FT		
FREEBOARD	1.00 FT		
RESIDUAL SOLIDS	1.08 FT		
MINIMUM TREATMENT	1.64 FT		
PRECIP-EVAP DEPTH	1.03 FT		
25 YR, 24-HR Runoff V	0 CF		
25 YR, 24-HR Runoff D	0.00 FT		
25 YR, 24-HR EVENT D	0.54 FT		
50 YR, 24-HR Runoff V	0 CF		
WORKING DEPTH	5.71 FT		
50 YR, 24-HR VOL	0 CF	≈	0.00 MG
25 YR, 24-HR VOL	37,176 CF	≈	0.28 MG
PRECIP-EVAP VOL	68,534 CF	≈	0.51 MG
WORKING VOLUME	331,924 CF	≈	2.48 MG
MINIMUM TREATMENT	80,998 CF	≈	0.61 MG
RESIDUAL SOLIDS	50,271 CF	≈	0.38 MG
TOTAL RAMP VOL	0 CF	≈	0.00 MG
FREEBOARD	70,723 CF	≈	0.53 MG
TOTAL VOLUME	639,626 CF	≈	4.78 MG

Deminsions	
BOTTOM WIDTH	257 FT
BOTTOM LENGTH	176 FT
INSIDE SLOPE	2.5 FT
TOP WIDTH	312 FT
TOP LENGTH	231 FT
START PUMPING	
STOP PUMPING	

ACTUAL PRECIP	42.7 in
ACTUAL EVAP	36.5 in
25 YR, 24-HR ACT	5.8 in
50 YR, 24-HR ACT	0.0 in

50 YR, 24-HR Runoff D	0.00 FT
50 YR, 24-HR EVENT D	0.00 FT

POND 2 - STAGE STORAGE				
TOTAL DEPTH	VOLUME (CF)	VOLUME (1,000 GALLON)	DEPTH BELOW TOP OF BERM	VOLUME (1,000 GALLON)
11.00 FT	639626	4782	0.00 FT	0.0
10.50 FT	603929	4516	0.50 FT	266.9
10.00 FT	568903	4254	1.00 FT	261.9
9.50 FT	534544	3997	1.50 FT	256.9
9.00 FT	500846	3745	2.00 FT	252.0
8.50 FT	467800	3498	2.50 FT	247.1
8.00 FT	435403	3256	3.00 FT	242.2
7.50 FT	403646	3018	3.50 FT	237.4
7.00 FT	372525	2785	4.00 FT	232.7
6.50 FT	342032	2557	4.50 FT	228.0
6.00 FT	312162	2334	5.00 FT	223.3
5.50 FT	282908	2115	5.50 FT	218.7
5.00 FT	254264	1901	6.00 FT	214.2
4.50 FT	226224	1691	6.50 FT	209.7
4.00 FT	198781	1486	7.00 FT	205.2
3.50 FT	171930	1286	7.50 FT	200.8
3.00 FT	145664	1089	8.00 FT	196.4
2.50 FT	119976	897	8.50 FT	192.1
2.00 FT	94861	709	9.00 FT	187.8
1.50 FT	70312	526	9.50 FT	183.6
1.00 FT	46323	346	10.00 FT	179.4
0.50 FT	22888	171	10.50 FT	175.2
0.00 FT	0	0	11.00 FT	171.1
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0
0.00 FT	0	0	11.00 FT	0.0


RECTANGULAR HOLDING POND 2
Storage Curve
Volume (1,000 Gallons)
0
1000
2000
3000
4000
5000
6000
Depth (FT)
15.00 FT
14.00 FT
13.00 FT
12.00 FT
11.00 FT
10.00 FT
9.00 FT
8.00 FT
7.00 FT
6.00 FT
5.00 FT
4.00 FT
3.00 FT
2.00 FT
1.00 FT
0.00 FT
Depth Bellow Free Board (FT)
0.00 FT
1.00 FT
2.00 FT
3.00 FT
4.00 FT
5.00 FT
6.00 FT
7.00 FT
8.00 FT
9.00 FT
10.00 FT
11.00 FT
12.00 FT
13.00 FT
14.00 FT
15.00 FT
0
100000
200000
300000
400000
500000
600000
700000
Volume (CF)
(CF)
(1,000 GALLON)

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Little Wabash
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: NUTRIENTS AS EXCRETED

Liquid Manure							
				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine Lact. Sow*	100%	384	400	69.1		45.7	52.0
Swine Gest. Sow*	100%	1391	400	89.0		63.7	74.1
Swine Nursery*	100%	3840	6	21.2		7.9	9.8
Swine Boar*	100%	4	325	0.2		0.1	0.1
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				180	0	117	136

Solid Manure							
				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine Lact. Sow*	0%	384	400	0.0		0.0	0.0
Swine Gest. Sow*	0%	1391	400	0.0		0.0	0.0
Swine Nursery*	0%	3840	6	0.0		0.0	0.0
Swine Boar*	0%	4	325	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				0	0	0	0

Solid Totals (lbs)		lb/ton
N	0	#DIV/0!
P2O5	0	#DIV/0!
K2O	0	#DIV/0!

Liquid Totals (lbs)		lb/1000gal
N	65526	26
P2O5	42887	17
K2O	49638	19

Annual Totals (lbs)	
N	65526
P2O5	42887
K2O	49638

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Little Wabash
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Little Wabash Water Usage workshe

Building	Capacity
Lact	384
gest	1391
boar	4
Nusery	0
Truck	0

type	gpd/hd
cups	0.1
swinging nipples, Edstom	0.2
swinging nipples	0.3
regular nipples, Edstrom	0.4
regular nipples	0.6
wet/dry	0.1

Waterers (place a 1 on which type of waterers)

Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry
Lact						
gest						
boar						
Nusery						
Truck						

Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry	total gpd
Lact	0	0	0	0	0	0	**0.00**
gest	0	0	0	0	0	0	**0.00**
boar	0	0	0	0	0	0	**0.00**
Nusery	0	0	0	0	0	0	**0.00**
Truck	0	0	0	0	0	0	**0.00**

	Cleaning			Presoak				
Building	pressure washer gpm	cleaning interval weeks	time to clean hrs	time hr	flow gph	sprinklers #	usage gpd	total gpd
Lact	8	1	6	0	0	0	0.00	**410.30**
gest	10	13	40	0	0	0	0.00	**263.01**
boar	10	13	2	0	0	0	0.00	**13.15**
Nusery		1		0	0	0	0.00	**0.00**
Truck		1		0	0	0	0.00	**0.00**

total	waterers	cleaning	total, gpd	
Lact	0.00	410.30	410.30	60%
gest	0.00	263.01	263.01	38%
boar	0.00	13.15	13.15	2%
Nusery	0.00	0.00	0.00	0%
Truck	0.00	0.00	0.00	0%
			686.47	

SECTION 2
LAKEVIEW CALCULATIONS

LAKEVIEW

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
LV1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV5	EARTHEN LAGOON (CELL A)
LV6	EARTHEN LAGOON (CELL B)
LV7	RECEPTION SUMP LIFT STATION (6'ø)
LV8	RECYCLE LIFT STATION (6'ø)
LV9	OFFICE
LV10	BOAR ISOLATION W/ 9" SHALLOW PIT
LV11	DEPOT – LOAD/UNLOAD
LV12	OFFICE

LEGEND

GAN — GRAVITY MANURE TRANSFER PIPE
FM — PRESSURE MANURE TRANSFER PIPE
OHE — AERIAL ELECTRIC LINE
W — WATER LINE

PRELIMINARY

0 60' 120'
BAR SCALE IN FEET

SCALE VALID ONLY ON 22"x34" SIZE PLANS

MURPHY-BROWN, LLC. NMP
PREPARED WITH ASSISTANCE FROM USDA-NRCS
ASSISTED BY: DANIEL N. FEUCHT
WAYNE COUNTY SOIL & WATER CONSERVATION DISTRICT
WAYNE COUNTY, ILLINOIS

MAURER-STUTZ
ENGINEERS SURVEYORS

SHEET TITLE: SITE PLAN - LAKEVIEW

PROJECT: MT. ERIE SOW FARM

CLIENT: MURPHY-BROWN, LLC.

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C105C

MAURER-STUTZ

ENGINEERS SURVEYORS

PROJECT: Murphy-Brown, LLC. - Lakeview

PROJECT NO.: 23804009.11

COMPUTATION BY: DNF DATE: 1/9/23

CHECKED BY: DATE:

Inputs:

Facility Animals & Loactions

Additional Animal Waste Inputs

25 YR Storm Event Inputs

50 YR Storm Event Inputs

Silage Leachate

Dairy Waste Water Inputs

Swine Waste Water Inputs

Outputs:

Facility Storage Volumes

Nutrients As Excreted

Storages:

Holding Pond 1

Holding Pond 2

Holding Pond 3

Holding Pond 4

Holding Pond 5

Uncovered Stacks

Covered Stacks

Rectangular Tanks

Circular Tanks 1-2

Circular Tanks 3-4

Settling Basin 1

Settling Basin 2

v.14.2

MAURER-STUTZ

Subject: Facility Animals & Locations

PROJECT: Murphy-Brown, LLC. - Lakeview
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: ______ DATE: ______ OF: 1

Animal Data

	Animals	Actual Quantity (hd)	Actual Weight (lbs)	210-AWMFH - Ch 4 Manure (cf/d-a)	Weight (lbs)	Manure (cf/d/AU)	Manure (CF/day)	VS (lbs/d/AU)	VS (lbs/day)	TS (lbs/d/AU)	TS (lbs/day)	NRCS AU
1	Swine Lact. Sow	364	400	0.41	423	0.97	141.1	5.40	786.2	5.90	859.0	145.6
2	Swine Gest. Sow	1494	400	0.18	440	0.41	244.5	2.30	1374.5	2.50	1494.0	597.6
3	Swine Boar	4	325	0.13	440	0.30	0.4	1.70	2.2	1.90	2.5	1.3
4	Swine Nursery	3640	6	0.04	27.5	1.40	30.6	8.80	192.2	10.00	218.4	21.8
5				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
6				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
7				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
8				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
9				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
	Total	5502					417		2355		2574	766

Rainfall Data

County, State	Wayne, Illinois
Precip for storage period	38.5 in
Annual Lake Evap	[illegible]
% Evap for storage period	96%
1 Yr 2 Hr Storm Event	1.55 in
2 Yr 24 Hr Storm Event	3.16 in
25 Yr 24 Hr Storm Event	5.8 in
Storage Period	11.0 Months

VS Loading Rate	4.00 lb/d*1000 CF
ODOR Loading Rate	2.46 lb/d*1000 CF

Rainfall Data (Indiana Only)

Location	Wayne, Illinois
50 Yr 24 Hr Storm Event	6.7 in
IDEM 50 Yr 24 Hr Storm	6.0 in
Greater of Storm Events	6.7 in

Location Data

	Animals	Holding Pond Cell A	Holding Pond Cell B	Covered Stack	Uncovered Stack	Rect. Tank	Circular Tank	Pasture	Settling Basin
1	Swine Lact. Sow	5%	95%						
2	Swine Gest. Sow	5%	95%						
3	Swine Boar	5%	95%						
4	Swine Nursery	5%	95%						
5									
6									
7									
8									
9									
	Parlor								
	Sprinkler								
	Waters								
	Other								
	Solid Removal								
	Lagoon treat	78%	22%						
	Silage leachate								
	Runoff								
	25Y Runoff								
	Solid Stored								
	Wash Water	5%	95%						
	Flush Water								
	Bedding								
	50Y Runoff								

*Values calculated above are based on data from the USDA-NRCS 210-AWMFH Chapter 4 March 2008

MAURER-STUTZ

PROJECT: Murphy Brown, LLC. - Lakeview
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: ______ DATE: ______ OF: 1

Subject: Facility Waste Volumes

Facility Volumes (CF/day)

	Holding Pond				
Facility	Cell A	Cell B	0	0	0
Solids Remov	0.00	0.00	0.00	0.00	0.00
Manure	20.83	395.73	0.00	0.00	0.00
Wash	5.19	98.60	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00
Daily Vol	26.02	494.33	0.00	0.00	0.00
Annual Vol	9496	180429	0	0	0
Density lb/cf	0	0	0	0	0
Annual Tons	0	0	0	0	0
Annual Gal	7.10E+04	1.35E+06	0.00E+00	0.00E+00	0.00E+00
# LOADS	119	2249	0	0	0
TIME	2	37	0	0	0

	Covered Stack					Uncovered Stack				
Facility	0%	0	0%	0	0	0	0	0	0	0
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	0	0	0	0	0	0	0	0	0	0
Density lb/cf	50	50	50	50	50	60	60	60	60	60
Annual Tons	0	0	0	0	0	0	0	0	0	0
Annual Gal	0	0	0	0	0	0	0	0	0	0
# LOADS	0	0	0	0	0	0	0	0	0	0
TIME	0	0	0	0	0	0	0	0	0	0

	Rect. Tank							
Facility	0	0	0	0	0	0	0	0
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	0	0	0	0	0	0	0	0
Density lb/cf	0	0	0	0	0	0	0	0
Annual Tons	0	0	0	0	0	0	0	0
Annual Gal	0	0	0	0	0	0	0	0
# LOADS	0	0	0	0	0	0	0	0
TIME	0	0	0	0	0	0	0	0

	Circular Tank				Pasture	Settling Basin	
Facility	0	0	0	0	0	0	0
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	0	0	0	0	0	0	0
Density lb/cf	0	0	0	0	0	0	0
Annual Tons	0	0	0	0	0	0	0
Annual Gal	0	0	0	0	0	0	0
# LOADS	0	0	0	0	0	0	0
TIME	0	0	0	0	0	0	0

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF/d	416.6	103.8	0.0	0.0	0.0	0.0	0.0	520.3

Annual Manure & Wales Water Volumes

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF	152044	37882	0	0	0	0	0	189925

Storage Volumes (CF/Period)

	Holding Pond				
Storage	Cell A	Cell B	0	0	0
Period (M)	11.00	11.00			
Period (D)	330	330	0	0	0
Required Vol					
CF	8586	163128	0	0	0
GALLONS	64195	1219705	0	0	0
TONS	0	0	0	0	0
Designed Vol					
CF	75904	208186	0	0	0
GALLONS	567533	1556604	0	0	0
TONS	0	0	0	0	0
Extra					
CF	67318	45058	0	0	0
GALLONS	503338	336900	0	0	0
TONS	0	0	0	0	0

	Covered Stack					Uncovered Stack				
Storage	0%	0	0%	0	0	0	0	0	0	0
Period (M)										
Period (D)	0	0	0	0	0	0	0	0	0	0
Required Vol										
CF	0	0	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0
Designed Vol										
CF	0	0	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0
Extra										
CF	0	0	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0

	Rect. Tank							
Storage	0	0	0	0	0	0	0	0
Period (M)								
Period (D)	0	0	0	0	0	0	0	0
Required Vol								
CF	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0
Designed Vol								
CF	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0
Extra								
CF	0	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0

	Circular Tank				Pasture	Settling Basin	
Storage	0	0	0	0	0	0	0
Period (M)							
Period (D)	0	0	0	0	0	0	0
Required Vol							
CF	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0
Designed Vol							
CF	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0
Extra							
CF	0	0	0	0	0	0	0
GALLONS	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0

Storage Volumes	Required Vol CF	Required Vol GALLONS	Designed Vol CF	Designed Vol GALLONS	Extra CF
Total	171713	1283900	284090	2124137	112376

	AVAILABLE	REQUIRED
PASTURE 1 ACRES		0.0 ac

(FIGURES 0.25 IN COVER ON ENTIRE PASTURE)

Annual Storage Volumes Hauled

Type	UNITS	Volume
LIQUID	GAL	2,121,794
SOLID	TONS	0

(MANURE & PRECIP)

APPLICATION INFROMATION

TYPE	SIZE	UNITS	LOAD/HR	# LOADS	TIME
LIQUID	[illegible]	GAL	[illegible]	2368	40
SOLID	400	bu	[illegible]	0	0

Storage Volumes (CF/Period)

	Holding Pond				
Storage	Cell A	Cell B	0	0	0
Working	8585.6604	163127.55	0	0	0
24 hr runoff	0	0	0	0	0
24 hr storm	48279.945	26624.471	0	0	0
Precip	50091.245	38323.635	0	0	0
Treatment	459248.81	129532.85	0	0	0
Residuals	178072.97	50226.464	0	0	0
Freeboard	92741.146	49889.083	0	0	0
Total	904344.87	502783.88	0	0	0
Gal to Haul	438727.22	1506250.5	0	0	0
Tons to Haul	-	-	-	-	-
Annual gal	478611.51	1643182.4	0	0	0
Annual tons					

	Covered Stack					Uncovered Stack				
Storage	0%	0	0%	0	0	0	0	0	0	0
Working	0	0	0	0	0	0	0	0	0	0
24 hr runoff	-	-	-	-	-	-	-	-	-	-
24 hr storm	-	-	-	-	-	-	-	-	-	-
Precip	-	-	-	-	-	-	-	-	-	-
Treatment	-	-	-	-	-	-	-	-	-	-
Residuals	-	-	-	-	-	-	-	-	-	-
Freeboard	-	-	-	-	-	-	-	-	-	-
Total	0	0	0	0	0	0	0	0	0	0
Gal to Haul	-	-	-	-	-	-	-	-	-	-
Tons to Haul	0	0	0	0	0	0	0	0	0	0
Annual gal										
Annual tons	0	0	0	0	0	0	0	0	0	0

	Rect. Tank							
Storage	0	0	0	0	0	0	0	0
Working	0	0	0	0	0	0	0	0
24 hr runoff	0	0	0	0	0	0	0	0
24 hr storm	0	0	0	0	0	0	0	0
Precip	0	0	0	0	0	0	0	0
Treatment	-	-	-	-	-	-	-	-
Residuals	0	0	0	0	0	0	0	0
Freeboard	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
Gal to Haul	0	0	0	0	0	0	0	0
Tons to Haul	-	-	-	-	-	-	-	-
Annual gal	0	0	0	0	0	0	0	0
Annual tons								

	Circular Tank				Pasture	Settling Basin	
Storage	0	0	0	0	0	0	0
Working	0	0	0	0	0	0	0
24 hr runoff	0	0	0	0			
24 hr storm	0	0	0	0			
Precip	0	0	0	0			
Treatment	-	-	-	-	-	-	-
Residuals	0	0	0	0			
Freeboard	0	0	0	0			
Total	0	0	0	0			
Gal to Haul	0	0	0	0	-		
Tons to Haul	-	-	-	-	0	0	0
Annual gal	0	0	0	0			
Annual tons					0	0	0

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MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeview
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Additional Waste Produced

Additions Data							
			Bedding				
Animals	Wash Gal/day	Flush Gal/day	Type	Rate lbs/d/A	Amount lbs/day	Density lb/CF	Amount CF/day
wine Lact. Sow	410				0	0	0.00
wine Gest. Sov	265				0	0	0.00
Swine Boar*	15				0	0	0.00
Swine Nursery*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
Parlor**						0	0.00
Sprinkler**	0					0	0.00
Waters**	0					0	0.00
Other**	86					0	0.00
Total	776				0		0.00

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

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MAURER-STUTZ

PROJECT: *Murphy-Brown, LLC. - Lakeview*
PROJECT NO.: *23804009.11*
COMPUTATION BY: *DNF* DATE: *1/9/23* SH. NO.: *1*
CHECKED BY: DATE: OF: *1*

Subject: *25yr Runoff Calculations*

Normal Runoff

Area = | Area = | Area =

	Concrete (CN=97)				Earth (CN=90)				Roof (CN=100)			
	Months	R	P	Total CF	Months	R	P	Total CF	Months	R	P	Total CF
X	JAN	0	2.47	0	JAN	0	2.47	0	JAN	100	2.5	0
X	FEB	0	2.57	0	FEB	0	2.57	0	FEB	100	2.6	0
X	MAR	0	4.01	0	MAR	0	4.01	0	MAR	100	4	0
X	APR	0	4.19	0	April	0	4.19	0	April	100	4.2	0
X	May	0	4.23	0	May	0	4.23	0	May	100	4.2	0
X	June	0	3.92	0	June	0	3.92	0	June	100	3.9	0
X	July	0	3.89	0	July	0	3.89	0	July	100	3.9	0
X	AUG	0	3.66	0	AUG	0	3.66	0	AUG	100	3.7	0
X	SEPT	0	3.22	0	SEPT	0	3.22	0	SEPT	100	3.2	0
X	OCT	0	3.12	0	OCT	0	3.12	0	OCT	100	3.1	0
	NOV	0	4.19	0	NOV	0	4.19	0	NOV	100	4.2	0
X	DEC	0	3.22	0	DEC	0	3.22	0	DEC	100	3.2	0
	Total		38.5	0	Total			0	Total			0

Net Normal Ruoff = 0 CF

25 YR - 24HR Storm Event

Concrete (CN=97)			Earth (CN=90)			Roof (CN=100)		
CN	97		CN	90		CN	100	
S	0.31	in	S	1.11	in	S	0.00	in
I_{25}	5.79	in	I_{25}	5.79	in	I_{25}	5.79	in
Q_{25}	5.43	in	Q_{25}	4.64	in	Q_{25}	5.79	in
Vol_{25}	0.00	CF	Vol_{25}	0.00	CF	Vol_{25}	0.00	CF

25yr Storm Event Runoff = 0 CF

Notes

Concrete Areas: | Earthen Areas: | Roofed Areas:

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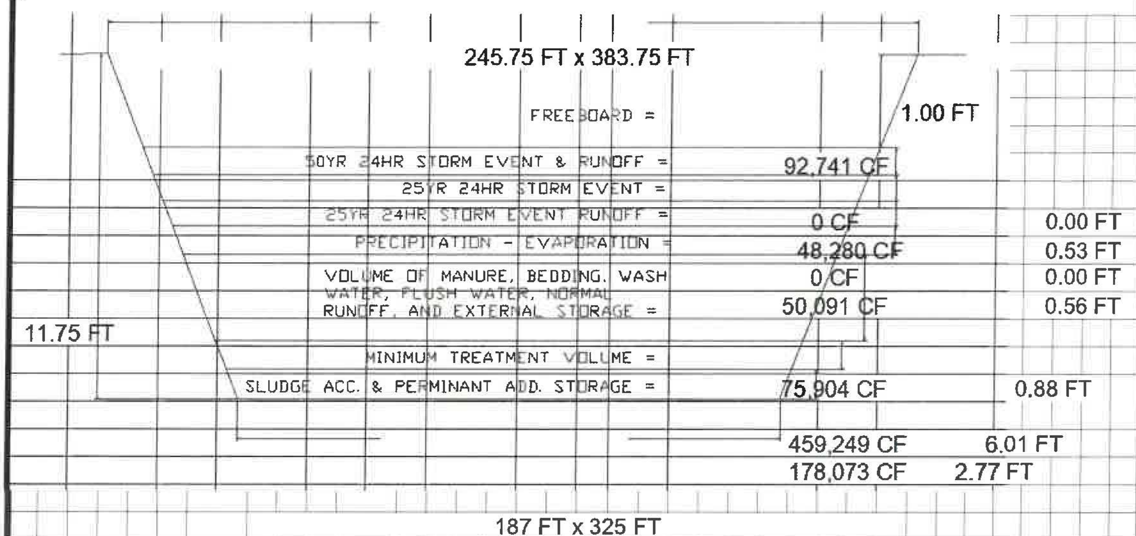
AWM 2010 v14.2

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeview
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Lagoon 1 Design Sheet, Cell A



EARTHEN STORAGE

TOTAL DEPTH	11.75 FT		
FREEBOARD	1.00 FT		
RESIDUAL SOLIDS	2.77 FT		
MINIMUM TREATMENT	6.01 FT		
PRECIP-EVAP DEPTH	0.56 FT		
25 YR, 24-HR Runoff V	0 CF		
25 YR, 24-HR Runoff D	0.00 FT		
25 YR, 24-HR EFF	0.53 FT		
50 YR, 24-HR Runoff V	0 CF		
WORKING DEPTH	0.88 FT		
50 YR, 24-HR VOL	0 CF	≈	0.00 MG
25 YR, 24-HR VOL	48,280 CF	≈	0.36 MG
PRECIP-EVAP VOL	50,091 CF	≈	0.37 MG
WORKING VOLUME	75,904 CF	≈	0.57 MG
MINIMUM TREATMENT	459,249 CF	≈	3.43 MG
RESIDUAL SOLIDS	178,073 CF	≈	1.33 MG
TOTAL RAMP VOL	0 CF	≈	0.00 MG
FREEBOARD	92,741 CF	≈	0.69 MG
TOTAL VOLUME	904,345 CF	≈	6.76 MG

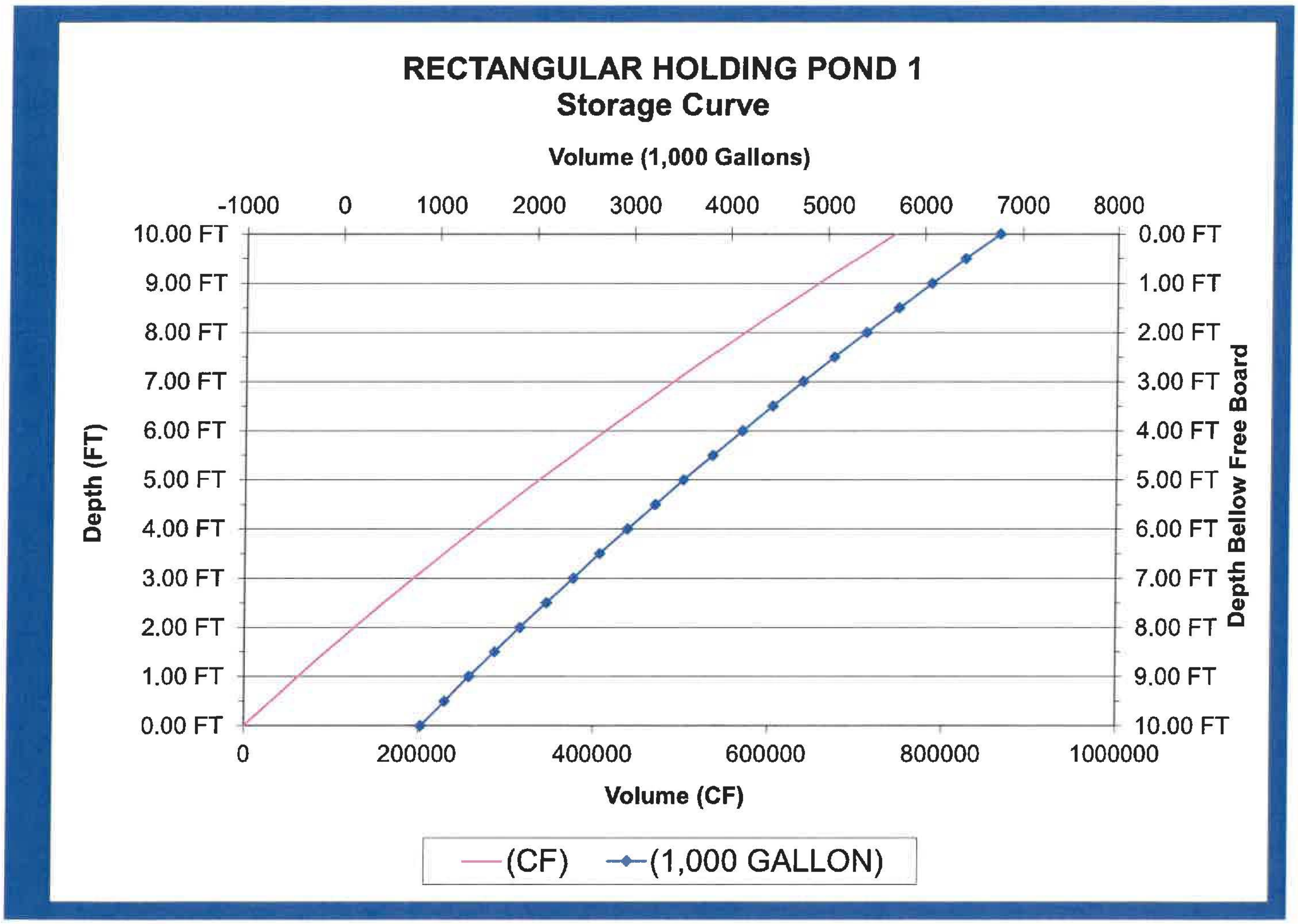
Deminsions	
BOTTOM WIDTH	187 FT
BOTTOM LENGTH	325 FT
INSIDE SLOPE	2.5 FT
TOP WIDTH	246 FT
TOP LENGTH	384 FT

START PUMPING	
STOP PUMPING	

ACTUAL PRECIP	38.5 in
ACTUAL EVAP	35.0 in
25 YR, 24-HR ACT	5.8 in
50 YR, 24-HR ACT	0.0 in

50 YR, 24-HR Runoff D	0.00 FT
50 YR, 24-HR EVENT D	0.00 FT

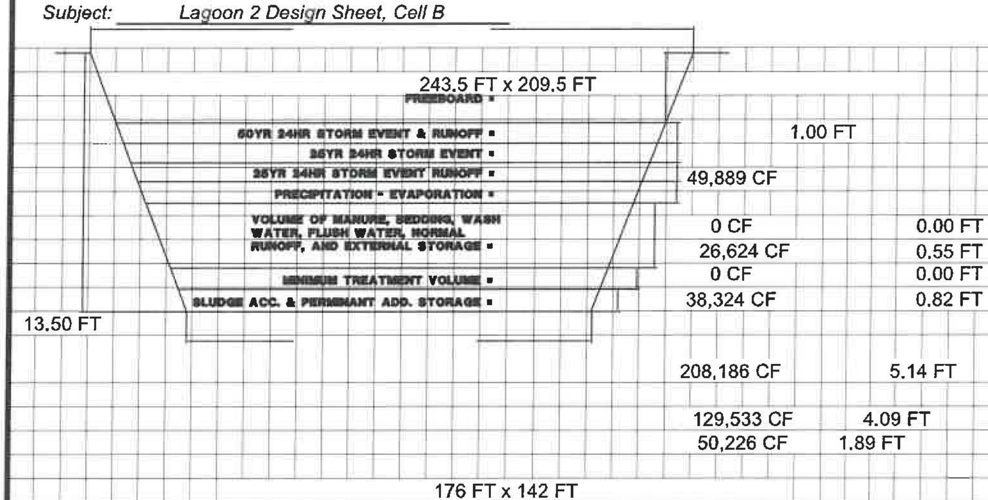
POND 1 - STAGE STORAGE				
TOTAL DEPTH	VOLUME (CF)	VOLUME (1,000 GALLON)	DEPTH BELOW	VOLUME (1,000 GAL / 1/2 FT)
11.75 FT	904345	6762	0.00 FT	0.0
11.25 FT	857584	6412	0.50 FT	349.6
10.75 FT	811604	6068	1.00 FT	343.8
10.25 FT	766398	5730	1.50 FT	338.0
9.75 FT	721960	5398	2.00 FT	332.3
9.25 FT	678284	5072	2.50 FT	326.6
8.75 FT	635364	4751	3.00 FT	320.9
8.25 FT	593193	4435	3.50 FT	315.3
7.75 FT	551765	4126	4.00 FT	309.8
7.25 FT	511074	3821	4.50 FT	304.2
6.75 FT	471114	3523	5.00 FT	298.8
6.25 FT	431878	3229	5.50 FT	293.4
5.75 FT	393360	2941	6.00 FT	288.0
5.25 FT	355555	2658	6.50 FT	282.7
4.75 FT	318454	2381	7.00 FT	277.4
4.25 FT	282053	2109	7.50 FT	272.2
3.75 FT	246346	1842	8.00 FT	267.0
3.25 FT	211325	1580	8.50 FT	261.9
2.75 FT	176985	1323	9.00 FT	256.8
2.25 FT	143319	1072	9.50 FT	251.7
1.75 FT	110321	825	10.00 FT	246.7
1.25 FT	77985	583	10.50 FT	241.8
0.75 FT	46305	346	11.00 FT	236.9
0.25 FT	15274	114	11.50 FT	232.0
-0.25 FT	-15114	-113	12.00 FT	227.2
0.00 FT	0	0	11.75 FT	-113.0
0.00 FT	0	0	11.75 FT	0.0
0.00 FT	0	0	11.75 FT	0.0
0.00 FT	0	0	11.75 FT	0.0
0.00 FT	0	0	11.75 FT	0.0
0.00 FT	0	0	11.75 FT	0.0
0.00 FT	0	0	11.75 FT	0.0


RECTANGULAR HOLDING POND 1
Storage Curve
Volume (1,000 Gallons)
-1000
0
1000
2000
3000
4000
5000
6000
7000
8000
Depth (FT)
10.00 FT
9.00 FT
8.00 FT
7.00 FT
6.00 FT
5.00 FT
4.00 FT
3.00 FT
2.00 FT
1.00 FT
0.00 FT
Depth Bellow Free Board
0.00 FT
1.00 FT
2.00 FT
3.00 FT
4.00 FT
5.00 FT
6.00 FT
7.00 FT
8.00 FT
9.00 FT
10.00 FT
0
200000
400000
600000
800000
1000000
Volume (CF)
(CF)
(1,000 GALLON)

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeview
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Lagoon 2 Design Sheet, Cell B



EARTHEN STORAGE

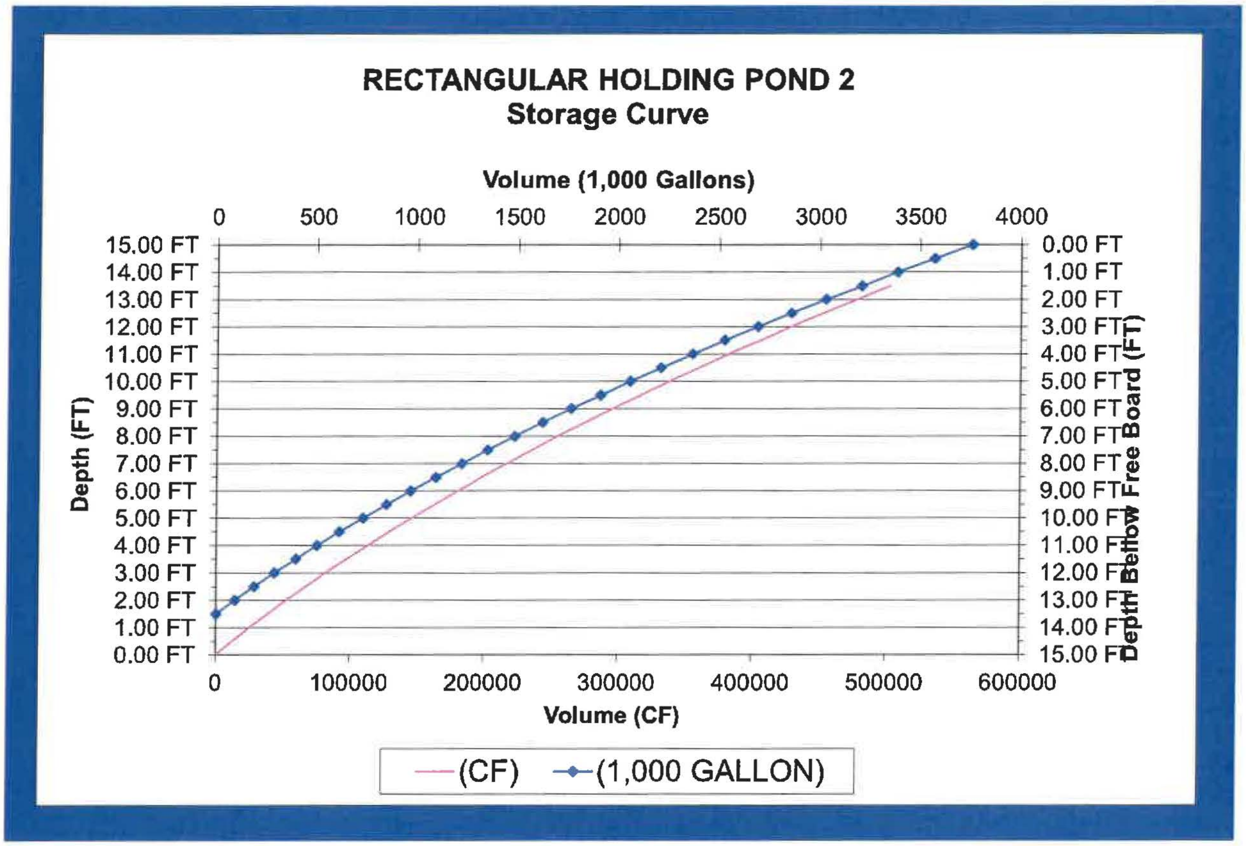
TOTAL DEPTH	13.50 FT		
FREEBOARD	1.00 FT		
RESIDUAL SOLIDS	1.89 FT		
MINIMUM TREATMENT	4.09 FT		
PRECIP-EVAP DEPTH	0.82 FT		
25 YR, 24-HR Runoff V	0 CF		
25 YR, 24-HR Runoff D	0.00 FT		
25 YR, 24-HR EVENT D	0.55 FT		
50 YR, 24-HR Runoff V	0 CF		
WORKING DEPTH	5.14 FT		
50 YR, 24-HR VOL	0 CF	≈	0.00 MG
25 YR, 24-HR VOL	26,624 CF	≈	0.20 MG
PRECIP-EVAP VOL	38,324 CF	≈	0.29 MG
WORKING VOLUME	208,186 CF	≈	1.56 MG
MINIMUM TREATMENT	129,533 CF	≈	0.97 MG
RESIDUAL SOLIDS	50,226 CF	≈	0.38 MG
TOTAL RAMP VOL	0 CF	≈	0.00 MG
FREEBOARD	49,889 CF	≈	0.37 MG
TOTAL VOLUME	502,784 CF	≈	3.76 MG

Deminsions	
BOTTOM WIDTH	176 FT
BOTTOM LENGTH	142 FT
INSIDE SLOPE	2.5 FT
TOP WIDTH	244 FT
TOP LENGTH	210 FT
START PUMPING	
STOP PUMPING	

ACTUAL PRECIP	38.5 in
ACTUAL EVAP	35.0 in
25 YR, 24-HR ACT	5.8 in
50 YR, 24-HR ACT	0.0 in

50 YR, 24-HR Runoff D	0.00 FT
50 YR, 24-HR EVENT D	0.00 FT

POND 2 - STAGE STORAGE				
TOTAL DEPTH	VOLUME (CF)	VOLUME (1,000 GALLON)	DEPTH BELOW TOP OF BERM	VOLUME (1,000 GALLON)
13.50 FT	502784	3759	0.00 FT	0.0
13.00 FT	477559	3571	0.50 FT	188.6
12.50 FT	452895	3386	1.00 FT	184.4
12.00 FT	428784	3206	1.50 FT	180.3
11.50 FT	405221	3030	2.00 FT	176.2
11.00 FT	382199	2858	2.50 FT	172.1
10.50 FT	359712	2690	3.00 FT	168.1
10.00 FT	337753	2525	3.50 FT	164.2
9.50 FT	316318	2365	4.00 FT	160.3
9.00 FT	295398	2209	4.50 FT	156.4
8.50 FT	274988	2056	5.00 FT	152.6
8.00 FT	255083	1907	5.50 FT	148.8
7.50 FT	235674	1762	6.00 FT	145.1
7.00 FT	216757	1621	6.50 FT	141.4
6.50 FT	198325	1483	7.00 FT	137.8
6.00 FT	180372	1349	7.50 FT	134.2
5.50 FT	162891	1218	8.00 FT	130.7
5.00 FT	145877	1091	8.50 FT	127.2
4.50 FT	129322	967	9.00 FT	123.8
4.00 FT	113221	847	9.50 FT	120.4
3.50 FT	97568	730	10.00 FT	117.0
3.00 FT	82356	616	10.50 FT	113.7
2.50 FT	67579	505	11.00 FT	110.5
2.00 FT	53231	398	11.50 FT	107.3
1.50 FT	39305	294	12.00 FT	104.1
1.00 FT	25795	193	12.50 FT	101.0
0.50 FT	12696	95	13.00 FT	97.9
0.00 FT	0	0	13.50 FT	94.9
0.00 FT	0	0	13.50 FT	0.0
0.00 FT	0	0	13.50 FT	0.0
0.00 FT	0	0	13.50 FT	0.0
0.00 FT	0	0	13.50 FT	0.0


RECTANGULAR HOLDING POND 2
Storage Curve
Volume (1,000 Gallons)
0
500
1000
1500
2000
2500
3000
3500
4000
15.00 FT
14.00 FT
13.00 FT
12.00 FT
11.00 FT
10.00 FT
9.00 FT
8.00 FT
7.00 FT
6.00 FT
5.00 FT
4.00 FT
3.00 FT
2.00 FT
1.00 FT
0.00 FT
Depth (FT)
0.00 FT
1.00 FT
2.00 FT
3.00 FT
4.00 FT
5.00 FT
6.00 FT
7.00 FT
8.00 FT
9.00 FT
10.00 FT
11.00 FT
12.00 FT
13.00 FT
14.00 FT
15.00 FT
Depth Bellow Free Board (FT)
0
100000
200000
300000
400000
500000
600000
Volume (CF)
(CF)
(1,000 GALLON)

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeview
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: NUTRIENTS AS EXCRETED

Liquid Manure							
				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine Lact. Sow*	100%	364	400	65.5		43.3	49.3
Swine Gest. Sow*	100%	1494	400	95.6		68.4	79.5
Swine Boar*	100%	4	325	0.2		0.1	0.1
Swine Nursery*	100%	3640	6	20.1		7.5	9.2
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				181	0	119	138

Solid Manure							
				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine Lact. Sow*	0%	364	400	0.0		0.0	0.0
Swine Gest. Sow*	0%	1494	400	0.0		0.0	0.0
Swine Boar*	0%	4	325	0.0		0.0	0.0
Swine Nursery*	0%	3640	6	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				0	0	0	0

Solid Totals (lbs)		lb/ton
N	0	#DIV/0!
P2O5	0	#DIV/0!
K2O	0	#DIV/0!

Liquid Totals (lbs)		lb/1000gal
N	66215	31
P2O5	43589	21
K2O	50465	24

Annual Totals (lbs)	
N	66215
P2O5	43589
K2O	50465

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Lakeview
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: 4089 Lakeview - Water Usage works

Building	Capacity
Lact	364
gest	1494
Boars	4

type	gpd/hd
cups	0.1
swinging nipples, Edstom	0.2
swinging nipples	0.3
regular nipples, Edstrom	0.4
regular nipples	0.6
wet/dry	0.1

Waterers (place a 1 on which type of waterers)

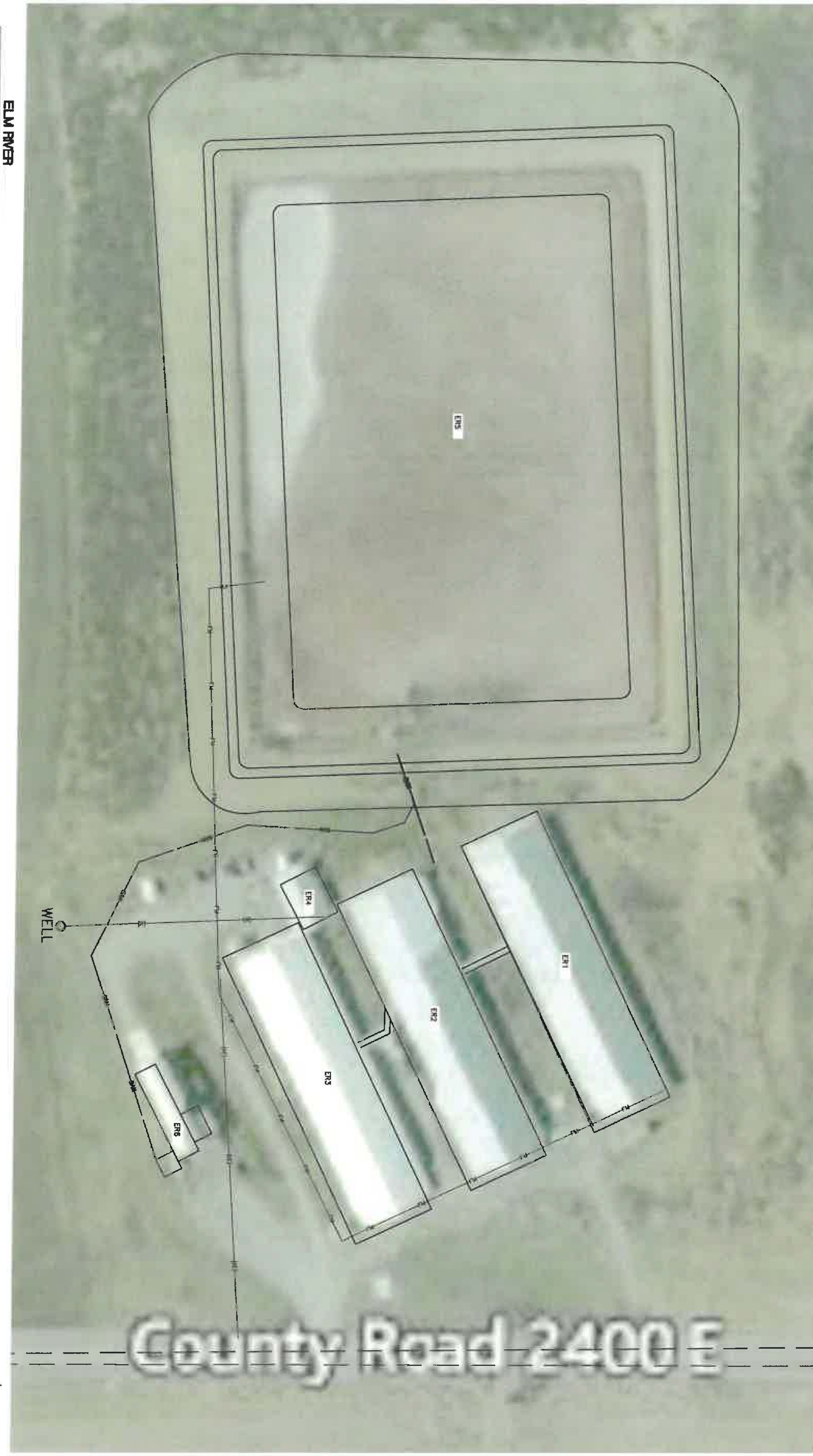
Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry
Lact						
gest						
Boars						
0						
0						

Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry	total gpd
Lact	0	0	0	0	0	0	**0.00**
gest	0	0	0	0	0	0	**0.00**
Boars	0	0	0	0	0	0	**0.00**
0	0	0	0	0	0	0	**0.00**
0	0	0	0	0	0	0	**0.00**

Cleaning				**Presoak**				
Building	pressure washer gpm	cleaning interval weeks	time to clean hrs	time hr	flow gph	sprinklers #	usage gpd	**total gpd**
Lact	8	1	6	0	0	0	0.00	**410.30**
gest	10	13	40	0	0	0	0.00	**263.01**
Boars	10	13	2	0	0	0	0.00	**13.15**

total	**waterers**	**cleaning**	**total, gpd**	
Lact	0.00	410.30	410.30	60%
gest	0.00	263.01	263.01	38%
Boars	0.00	13.15	13.15	2%
			686.47	

SECTION 2
ELM RIVER CALCULATIONS



ELM RIVER

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
ER1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ER2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ER3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ER5	EARTHEN LAGOON
ER6	TRUCK WASH BUILDING
ER4	OFFICE

LEGEND

- SAN — GRAVITY MANURE TRANSFER PIPE
- FM — PRESSURE MANURE TRANSFER PIPE
- AE — AERIAL ELECTRIC LINE
- W — WATER LINE

PRELIMINARY

BAR SCALE IN FEET

100'

SCALE VALID ONLY ON 22"x34" SIZE PLANS

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C105D

CLIENT: MURPHY-BROWN, LLC.

SHEET TITLE: SITE PLAN - ELM RIVER

PROJECT: MT. ERIE SOW FARM

MAURER-STUTZ ENGINEERS SURVEYORS

MURPHY-BROWN, LLC. NMP PREPARED WITH ASSISTANCE FROM USDA-NRCS ASSISTED BY: DANIEL N. FEUCHT WAYNE COUNTY SOIL & WATER CONSERVATION DISTRICT WAYNE COUNTY, ILLINOIS

MAURER-STUTZ

ENGINEERS SURVEYORS

PROJECT: Murphy-Brown, LLC. - Elm River

PROJECT NO.: 23804009.11

COMPUTATION BY: DNF *DATE:* 1/9/23

CHECKED BY: *DATE:*

Inputs:

- Facility Animals & Loactions
- Additional Animal Waste Inputs
- 25 YR Storm Event Inputs
- 50 YR Storm Event Inputs
- Silage Leachate
- Dairy Waste Water Inputs
- Swine Waste Water Inputs

Outputs:

- Facility Storage Volumes
- Nutrients As Excreted

Storages:

- Holding Pond 1
- Holding Pond 2
- Holding Pond 3
- Holding Pond 4
- Holding Pond 5
- Uncovered Stacks
- Covered Stacks
- Rectangular Tanks
- Circular Tanks 1-2
- Circular Tanks 3-4
- Settling Basin 1
- Settling Basin 2

v.14.2

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Elm River
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Facility Animals & Locations

	Animal Data											
		Actual		210-AWMFH - Ch 4								NRCS AU
		Quantity	Weight	Manure	Weight	Manure	Manure	VS		TS		
	Animals	hd	lbs	cf/d-a	lbs	cf/d/AU	CF/day	lbs/d/AU	lbs/day	lbs/d/AU	lbs/day	
1	Swine Lact. Sow	384	400	0.41	423	0.97	141.1	5.40	786.2	5.90	859.0	145.6
2	Swine Gest. Sow	1298	400	0.18	440	0.41	212.4	2.30	1194.2	2.50	1298.0	519.2
3	Swine Nursery	3640	6	0.04	27.5	1.40	30.6	8.80	192.2	10.00	218.4	21.8
4	Swine Boar	4	325	0.13	440	0.30	0.4	1.70	2.2	1.90	2.5	1.3
5				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
6				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
7				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
8				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
9				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
	Total	5306					384		2175		2378	688

Rainfall Data	
County, State	Wayne, Illinois
Precip for storage period	42.7 in
Annual Lake Evap	35.5 in
% Evap for storage period	100%
1 Yr 2 Hr Storm Event	1.55 in
2 Yr 24 Hr Storm Event	3.16 in
25 Yr 24 Hr Storm Event	5.8 in
Storage Period	12.0 Months

VS Loading Rate	4.00 lb/d*1000 CF
ODOR Loading Rate	2.46 lb/d*1000 CF

Rainfall Data (Indiana Only)	
Location	Wayne, Illinois
50 Yr 24 Hr Storm Event	6.7 in
IDEM 50 Yr 24 Hr Storm	6.0 in
Greater of Storm Events	6.7 in

	Location Data							
	Animals	Holding Pond	Covered Stack	Uncovered Stack	Rect. Tank	Circular Tank	Pasture	Settling Basin
		Cell A						
1	Swine Lact. Sow	100%						
2	Swine Gest. Sow	100%						
3	Swine Nursery	100%						
4	Swine Boar	100%						
5								
6								
7								
8								
9								
	Parlor							
	Sprinkler							
	Waters							
	Other							
	Solid Removal							
	Lagoon treat							
	Silage leachate							
	Runoff							
	25Y Runoff							
	Solid Stored							
	Wash Water	100%						
	Flush Water							
	Bedding							
	50Y Runoff							

*Values calculated above are based on data from the USDA-NRCS 210-AWMFH Chapter 4 March 2008

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Elm River
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: ______ DATE: ______ OF: 1

Subject: Facility Waste Volumes

Facility Volumes (CF/day)

	Holding Pond					Covered Stack					Uncovered Stack					Rect. Tank								Circular Tank				Pasture	Settling Basin	
Facility	Cell A	0	0	0	0	0%	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	384.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	132.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	516.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	188665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Density lb/cf	0	0	0	0	0	50	50	50	50	50	60	60	60	60	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Tons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Gal	1.41E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
# LOADS	2352	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TIME	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF/d	384.5	132.4	0.0	0.0	0.0	0.0	0.0	516.9

Annual Manure & Wates Water Volumes

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF	140337	48328	0	0	0	0	0	188665

Storage Volumes (CF/Period)

	Holding Pond					Covered Stack					Uncovered Stack					Rect. Tank								Circular Tank				Pasture	Settling Basin	
Storage	Cell A	0	0	0	0	0%	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Period (M)	12.00																													
Period (D)	365	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Required Vol																														
CF	188665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	1410651	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Designed Vol																														
CF	426612	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	3189779	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Extra																														
CF	237947	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	1779128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Storage Volumes	Required Vol CF	Required Vol GALLONS	Designed Vol CF	Designed Vol GALLONS	Extra CF
Total	188665	1410651	426612	3189779	237947

	AVAILABLE	REQUIRED
PASTURE 1 ACRES		0.0 ac

(FIGURES 0.25 IN COVER ON ENTIRE PASTURE)

Annual Storage Volumes Hauled

Type	UNITS	Volume
LIQUID	GAL	2,904,198
SOLID	TONS	0

(MANURE & PRECIP)

APPLICATION INFROMATION

TYPE	SIZE	UNITS	LOAD/HR	# LOADS	TIME
LIQUID	600	GAL	60	2352	40
SOLID	400	bu	2	0	0

Storage Volumes (CF/Period)

	Holding Pond					Covered Stack					Uncovered Stack					Rect. Tank								Circular Tank				Pasture	Settling Basin	
Storage	Cell A	0	0	0	0	0%	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Working	188665.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24 hr runoff	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
24 hr storm	126778.2	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
Precip	199752.18	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
Treatment	895145.04	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Residuals	337458.96	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
Freeboard	494761.5	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
Total	2480523.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Gal to Haul	2904198	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	-		
Tons to Haul	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Annual gal	2904198	0	0	0	0											0	0	0	0	0	0	0	0	0	0	0	0			
Annual tons						0	0	0	0	0	0	0	0	0	0													0	0	0

S:\238\2004 project numbers\23804009.11(Smithfield-NMP Updates)\AWM\2023\4090 Elm River MSI AWM 2010 v14.2

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Elm River
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Additional Waste Produced

Additions Data							
			Bedding				
Animals	Wash Gal/day	Flush Gal/day	Type	Rate lbs/d/A	Amount lbs/day	Density lb/CF	Amount CF/day
wine Lact. Sow	410				0	0	0.00
wine Gest. Sow	265				0	0	0.00
Swine Nursery*	0				0	0	0.00
Swine Boar*	15				0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
Parlor**						0	0.00
Sprinkler**	0					0	0.00
Waters**	0					0	0.00
Other**	300					0	0.00
Total	990				0		0.00

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Elm River
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: 25yr Runoff Calculations

Normal Runoff

Area = | Area = | Area =

	Concrete (CN=97)				Earth (CN=90)				Roof (CN=100)			
	Months	R	P	Total CF	Months	R	P	Total CF	Months	R	P	Total CF
X	JAN	0	2.47	0	JAN	0	2.47	0	JAN	100	2.5	0
X	FEB	0	2.57	0	FEB	0	2.57	0	FEB	100	2.6	0
X	MAR	0	4.01	0	MAR	0	4.01	0	MAR	100	4	0
X	APR	0	4.19	0	April	0	4.19	0	April	100	4.2	0
X	May	0	4.23	0	May	0	4.23	0	May	100	4.2	0
X	June	0	3.92	0	June	0	3.92	0	June	100	3.9	0
X	July	0	3.89	0	July	0	3.89	0	July	100	3.9	0
X	AUG	0	3.66	0	AUG	0	3.66	0	AUG	100	3.7	0
X	SEPT	0	3.22	0	SEPT	0	3.22	0	SEPT	100	3.2	0
X	OCT	0	3.12	0	OCT	0	3.12	0	OCT	100	3.1	0
X	NOV	0	4.19	0	NOV	0	4.19	0	NOV	100	4.2	0
X	DEC	0	3.22	0	DEC	0	3.22	0	DEC	100	3.2	0
	Total		42.7	0	Total			0	Total			0

Net Normal Ruoff = 0 CF

25 YR - 24HR Storm Event

Concrete (CN=97)			Earth (CN=90)			Roof (CN=100)		
CN	97		CN	90		CN	100	
S	0.31	in	S	1.11	in	S	0.00	in
I_{25}	5.79	in	I_{25}	5.79	in	I_{25}	5.79	in
Q_{25}	5.43	in	Q_{25}	4.64	in	Q_{25}	5.79	in
Vol_{25}	0.00	CF	Vol_{25}	0.00	CF	Vol_{25}	0.00	CF

25yr Storm Event Runoff = 0 CF

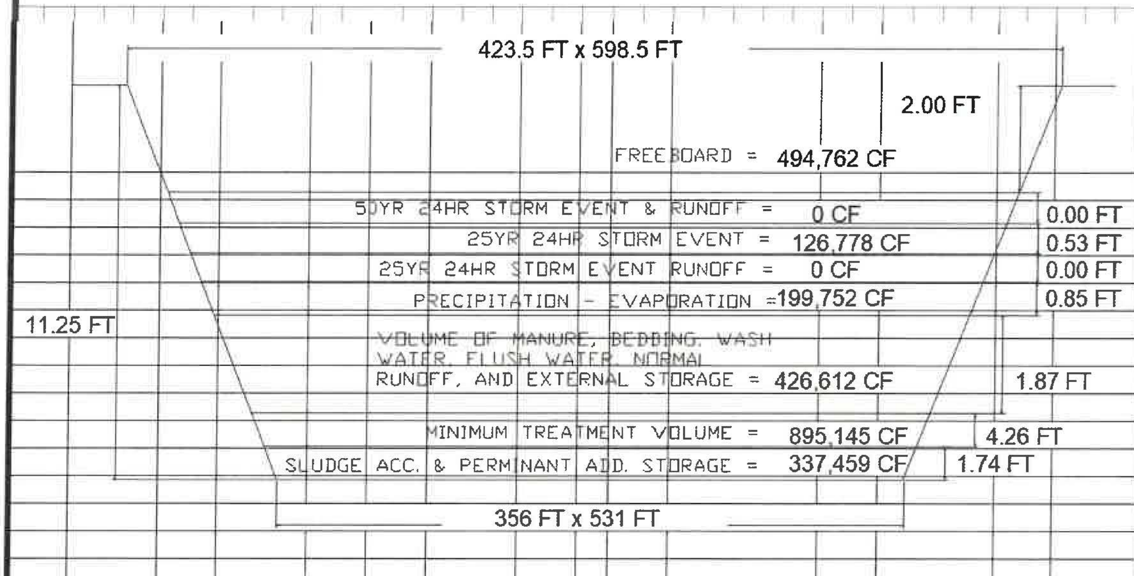
Notes

Concrete Areas: Earthen Areas: Roofed Areas:

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Elm River
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: *Lagoon 1 Design Sheet, Cell A*



EARTHEN STORAGE

TOTAL DEPTH	11.25 FT
FREEBOARD	2.00 FT
RESIDUAL SOLIDS	1.74 FT
MINIMUM TREATMENT	4.26 FT
PRECIP-EVAP DEPTH	0.85 FT
25 YR, 24-HR Runoff V	0 CF
25 YR, 24-HR Runoff D	0.00 FT
25 YR, 24-HR EFF	0.53 FT
50 YR, 24-HR Runoff V	0 CF
WORKING DEPTH	1.87 FT

50 YR, 24-HR VOL	0 CF	≈	0.00 MG
25 YR, 24-HR VOL	126,778 CF	≈	0.95 MG
PRECIP-EVAP VOL	199,752 CF	≈	1.49 MG
WORKING VOLUME	426,612 CF	≈	3.19 MG
MINIMUM TREATMENT	895,145 CF	≈	6.69 MG
RESIDUAL SOLIDS	337,459 CF	≈	2.52 MG
TOTAL RAMP VOL	0 CF	≈	0.00 MG
FREEBOARD	494,762 CF	≈	3.70 MG
TOTAL VOLUME	2,480,524 CF	≈	18.55 MG

Deminsions	
BOTTOM WIDTH	356 FT
BOTTOM LENGTH	531 FT
INSIDE SLOPE	3.0 FT
TOP WIDTH	424 FT
TOP LENGTH	599 FT

START PUMPING	
STOP PUMPING	

ACTUAL PRECIP	42.7 in
ACTUAL EVAP	36.5 in
25 YR, 24-HR ACT	5.8 in
50 YR, 24-HR ACT	0.0 in

50 YR, 24-HR Runoff D	0.00 FT
50 YR, 24-HR EVENT D	0.00 FT

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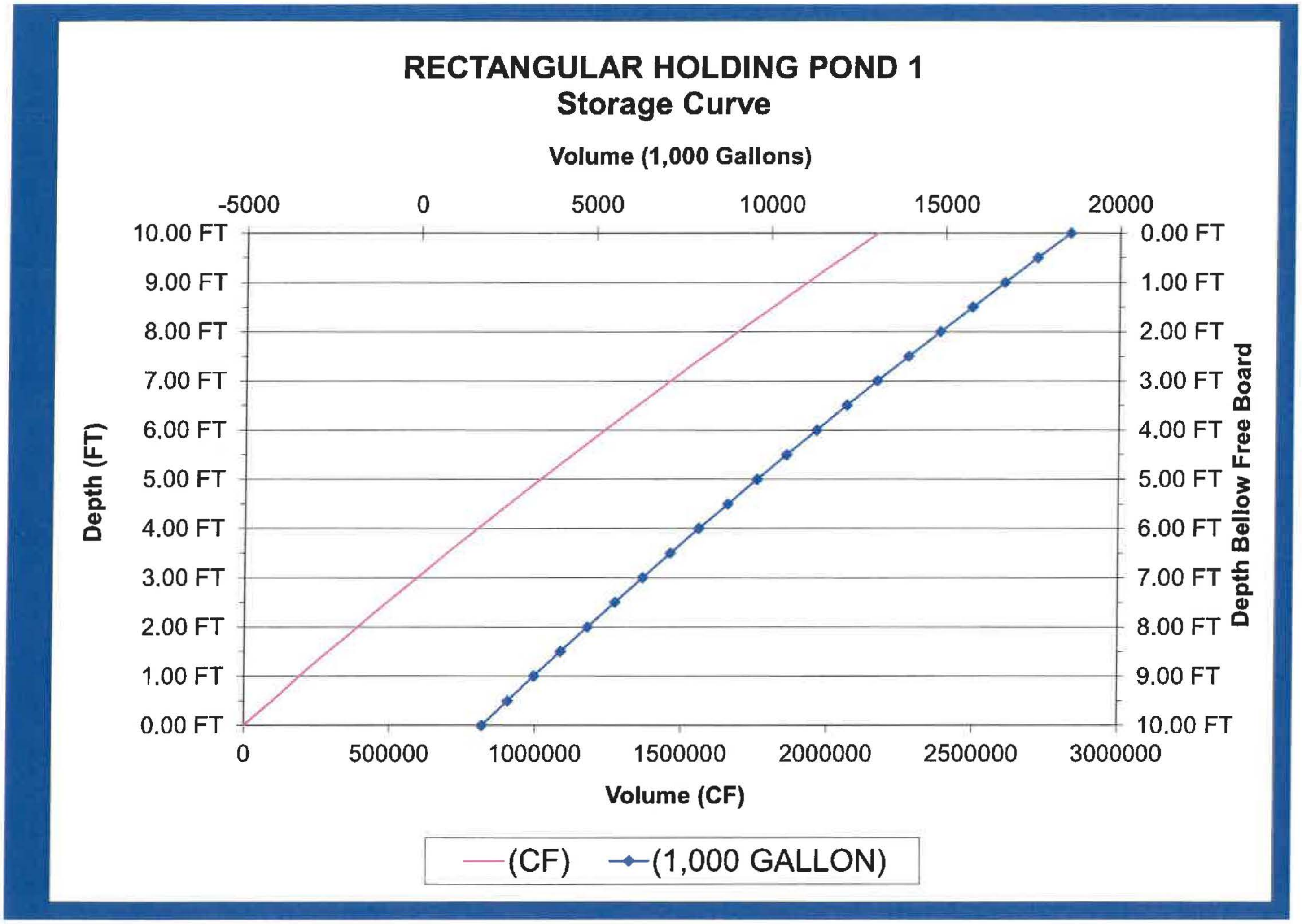
POND 1 - STAGE STORAGE				
TOTAL DEPTH	VOLUME (CF)	VOLUME (1,000 GALLON)	DEPTH BELOW	VOLUME (1,000 GAL / 1/2 FT)
11.25 FT	2480524	18547	0.00 FT	0.0
10.75 FT	2354556	17605	0.50 FT	941.9
10.25 FT	2230113	16675	1.00 FT	930.5
9.75 FT	2107185	15755	1.50 FT	919.1
9.25 FT	1985762	14848	2.00 FT	907.9
8.75 FT	1865837	13951	2.50 FT	896.7
8.25 FT	1747400	13065	3.00 FT	885.6
7.75 FT	1630441	12191	3.50 FT	874.5
7.25 FT	1514953	11327	4.00 FT	863.5
6.75 FT	1400925	10475	4.50 FT	852.6
6.25 FT	1288350	9633	5.00 FT	841.7
5.75 FT	1177218	8802	5.50 FT	830.9
5.25 FT	1067519	7982	6.00 FT	820.2
4.75 FT	959246	7172	6.50 FT	809.6
4.25 FT	852389	6373	7.00 FT	799.0
3.75 FT	746938	5585	7.50 FT	788.5
3.25 FT	642886	4807	8.00 FT	778.0
2.75 FT	540222	4039	8.50 FT	767.6
2.25 FT	438939	3282	9.00 FT	757.3
1.75 FT	339027	2535	9.50 FT	747.0
1.25 FT	240476	1798	10.00 FT	736.9
0.75 FT	143279	1071	10.50 FT	726.7
0.25 FT	47426	355	11.00 FT	716.7
-0.25 FT	-47093	-352	11.50 FT	706.7
0.00 FT	0	0	11.25 FT	-352.1
0.00 FT	0	0	11.25 FT	0.0
0.00 FT	0	0	11.25 FT	0.0
0.00 FT	0	0	11.25 FT	0.0
0.00 FT	0	0	11.25 FT	0.0
0.00 FT	0	0	11.25 FT	0.0
0.00 FT	0	0	11.25 FT	0.0
0.00 FT	0	0	11.25 FT	0.0


RECTANGULAR HOLDING POND 1
Storage Curve
Volume (1,000 Gallons)
-5000
0
5000
10000
15000
20000
10.00 FT
9.00 FT
8.00 FT
7.00 FT
6.00 FT
5.00 FT
4.00 FT
3.00 FT
2.00 FT
1.00 FT
0.00 FT
Depth (FT)
0.00 FT
1.00 FT
2.00 FT
3.00 FT
4.00 FT
5.00 FT
6.00 FT
7.00 FT
8.00 FT
9.00 FT
10.00 FT
Depth Bellow Free Board
0
500000
1000000
1500000
2000000
2500000
3000000
Volume (CF)
(CF)
(1,000 GALLON)

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Elm River
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: NUTRIENTS AS EXCRETED

Liquid Manure

				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine Lact. Sow*	100%	364	400	65.5		43.3	49.3
Swine Gest. Sow*	100%	1298	400	83.1		59.4	69.1
Swine Nursery*	100%	3640	6	20.1		7.5	9.2
Swine Boar*	100%	4	325	0.2		0.1	0.1
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				169	0	110	128

Solid Manure

				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine Lact. Sow*	0%	364	400	0.0		0.0	0.0
Swine Gest. Sow*	0%	1298	400	0.0		0.0	0.0
Swine Nursery*	0%	3640	6	0.0		0.0	0.0
Swine Boar*	0%	4	325	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				0	0	0	0

Solid Totals (lbs)		lb/ton
N	0	#DIV/0!
P2O5	0	#DIV/0!
K2O	0	#DIV/0!

Liquid Totals (lbs)		lb/1000gal
N	61636	21
P2O5	40312	14
K2O	46656	16

Annual Totals (lbs)	
N	61636
P2O5	40312
K2O	46656

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

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MAURER-STUTZ

PROJECT: *Murphy-Brown, LLC. - Elm River*
PROJECT NO.: *23804009.11*
COMPUTATION BY: ______ DATE: *1/9/23* SH. NO.: *1*
CHECKED BY: ______ DATE: ______ OF: *1*

Subject: 4090 Elm River Water Usage works

Building	Capacity
Lact	364
gest	1298
Boar	4
Nusery	0
Truck	0

type	gpd/hd
cups	0.1
swinging nipples, Edstom	0.2
swinging nipples	0.3
regular nipples, Edstrom	0.4
regular nipples	0.6
wet/dry	0.1

Waterers (place a 1 on which type of waterers)

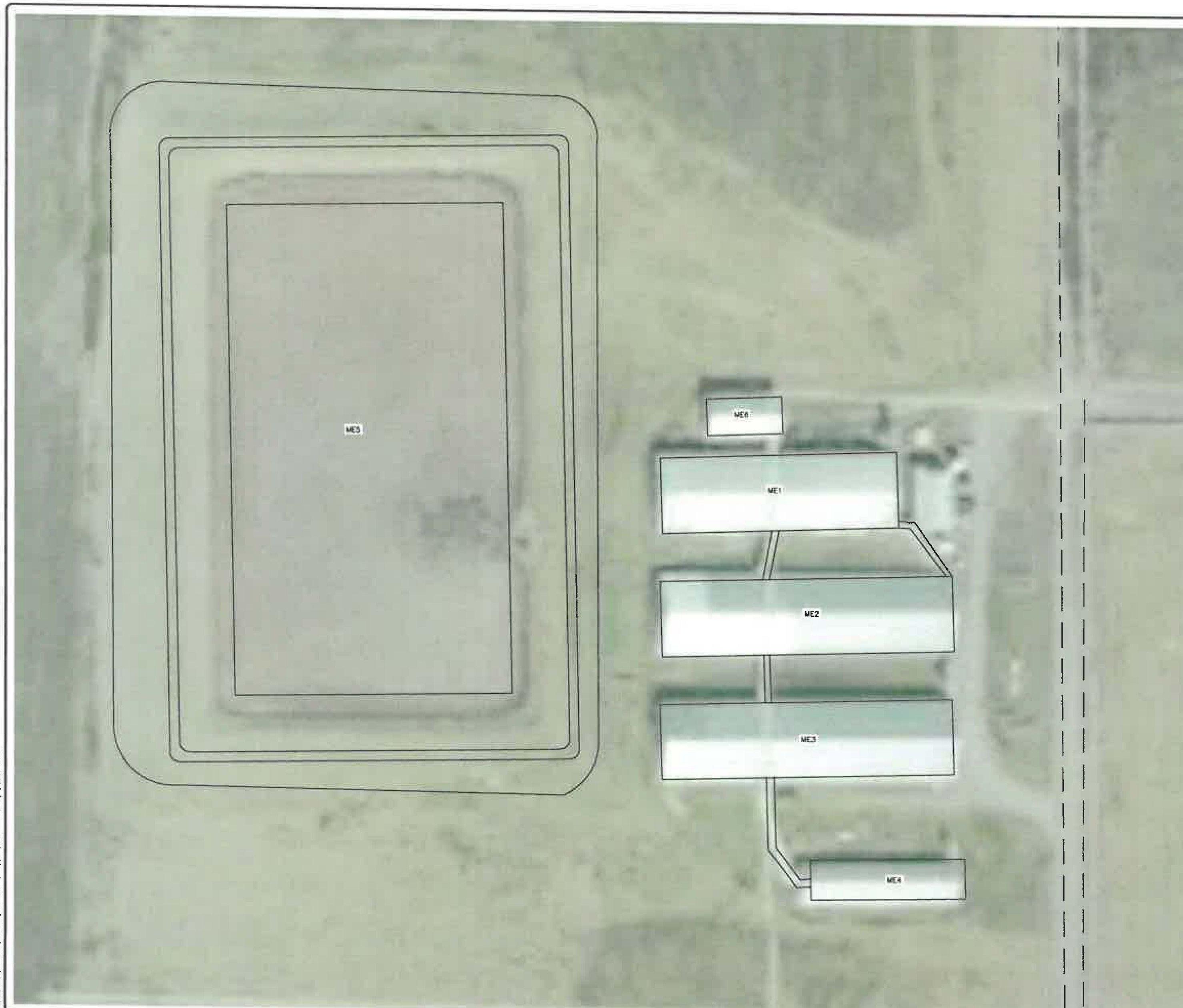
Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry
Lact						
gest						
Boar						
Nusery						
Truck						

Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry	total gpd
Lact	0	0	0	0	0	0	**0.00**
gest	0	0	0	0	0	0	**0.00**
Boar	0	0	0	0	0	0	**0.00**
Nusery	0	0	0	0	0	0	**0.00**
Truck	0	0	0	0	0	0	**0.00**

	Cleaning			Presoak				
Building	pressure washer gpm	cleaning interval weeks	time to clean hrs	time hr	flow gph	sprinklers #	usage gpd	total gpd
Lact	8	1	6	0	0	0	0.00	**410.30**
gest	10	13	40	0	0	0	0.00	**263.01**
Boar	10	13	2	0	0	0	0.00	**13.15**
Nusery		1		0	0	0	0.00	**0.00**
Truck	5	0.29	2	0	0	0	0.00	**294.76**

total	waterers	cleaning	total, gpd	
Lact	0.00	410.30	410.30	42%
gest	0.00	263.01	263.01	27%
Boar	0.00	13.15	13.15	1%
Nusery	0.00	0.00	0.00	0%
Truck	0.00	294.76	294.76	30%
			981.22	

SECTION 2
MT. ERIE CALCULATIONS



MT. ERIE

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
ME1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME5	EARTHEN LAGOON
ME6	SWINE BUILDING

LEGEND

- GMN — GRAVITY MANURE TRANSFER PIPE
- FM — PRESSURE MANURE TRANSFER PIPE
- AE — AERIAL ELECTRIC LINE
- W — WATER LINE

PRELIMINARY

0 60' 100'
BAR SCALE IN FEET

SCALE VALID ONLY ON 22"x34" SIZE PLANS

MURPHY-BROWN, LLC. NMP
PREPARED WITH ASSISTANCE
FROM USDA-NRCS
ASSISTED BY: DANIEL N. FEUCHT
WAYNE COUNTY SOIL & WATER
CONSERVATION DISTRICT
WAYNE COUNTY, ILLINOIS

MAURER-STUTZ
ENGINEERS SURVEYORS

SHEET TITLE: SITE PLAN - MT. ERIE

PROJECT: MT. ERIE SOW FARM

CLIENT: MURPHY-BROWN, LLC.

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804008.11
SHEET: C105E

MAURER-STUTZ

ENGINEERS SURVEYORS

PROJECT: Murphy-Brown, LLC. - Mt. Erie

PROJECT NO.: 23804009.11

COMPUTATION BY: DNF DATE: 1/9/23

CHECKED BY: DATE:

Inputs:

- Facility Animals & Loactions
- Additional Animal Waste Inputs
- 25 YR Storm Event Inputs
- 50 YR Storm Event Inputs
- Silage Leachate
- Dairy Waste Water Inputs
- Swine Waste Water Inputs

Outputs:

- Facility Storage Volumes
- Nutrients As Excreted

Storages:

- Holding Pond 1
- Holding Pond 2
- Holding Pond 3
- Holding Pond 4
- Holding Pond 5
- Uncovered Stacks
- Covered Stacks
- Rectangular Tanks
- Circular Tanks 1-2
- Circular Tanks 3-4
- Settling Basin 1
- Settling Basin 2

v.14.2

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Mt. Erie
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: ______ DATE: ______ OF: 1

Subject: *Facility Animals & Locations*

Animal Data

	Animals	Actual Quantity hd	Actual Weight lbs	210-AWMFH - Ch 4 Manure cf/d-a	Weight lbs	Manure cf/d/AU	Manure CF/day	VS lbs/d/AU	VS lbs/day	TS lbs/d/AU	TS lbs/day	NRCS AU
1	Swine Lact. Sow	364	400	0.41	423	0.97	141.1	5.40	786.2	5.90	859.0	145.6
2	Swine Gest. Sow	1459	400	0.18	440	0.41	238.7	2.30	1342.3	2.50	1459.0	583.6
3	Swine Boar	4	325	0.13	440	0.30	0.4	1.70	2.2	1.90	2.5	1.3
4	Swine Nursery	3640	6	0.04	27.5	1.40	30.6	8.80	192.2	10.00	218.4	21.8
5				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
6				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
7				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
8				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
9				0.00	0	0.00	0.0	0.00	0.0	0.00	0.0	0.0
	Total	5467					411		2323		2539	752

Rainfall Data

County, State	Wayne, Illinois
Precip for storage period	42.7 in
Annual Lake Evap	[illegible]
% Evap for storage period	100%
1 Yr 2 Hr Storm Event	1.55 in
2 Yr 24 Hr Storm Event	3.16 in
25 Yr 24 Hr Storm Event	5.8 in
Storage Period	12.0 Months

VS Loading Rate	4.00 lb/d*1000 CF
ODOR Loading Rate	2.46 lb/d*1000 CF

Rainfall Data (Indiana Only)

Location	Wayne, Illinois
50 Yr 24 Hr Storm Event	6.7 in
IDEM 50 Yr 24 Hr Storm	6.0 in
Greater of Storm Events	6.7 in

Location Data

	Animals	Holding Pond Cell A	Covered Stack	Uncovered Stack	Rect. Tank	Circular Tank	Pasture	Settling Basin
1	Swine Lact. Sow	100%						
2	Swine Gest. Sow	100%						
3	Swine Boar	100%						
4	Swine Nursery	100%						
5								
6								
7								
8								
9								
	Parlor							
	Sprinkler							
	Waters							
	Other							
	Solid Removal							
	Lagoon treat							
	Silage leachate							
	Runoff							
	25Y Runoff							
	Solid Stored							
	Wash Water	100%						
	Flush Water							
	Bedding							
	50Y Runoff							

*Values calculated above are based on data from the USDA-NRCS 210-AWMFH Chapter 4 March 2008

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MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Mt. Erie
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: ______ DATE: ______ OF: 1

Subject: Facility Waste Volumes

Facility Volumes (CF/day)

	Holding Pond					Covered Stack					Uncovered Stack					Rect. Tank								Circular Tank				Pasture	Settling Basin	
Facility	Cell A	0	0	0	0	0%	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solids Remov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manure	419.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wash	98.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flush	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bedding	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silage Leach	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solids Store	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily Vol	517.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Vol	188896	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Density lb/cf	0	0	0	0	0	50	50	50	50	50	60	60	60	60	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Tons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Gal	1412372	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
# LOADS	2354	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TIME	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF/d	419.2	98.3	0.0	0.0	0.0	0.0	0.0	517.5

Annual Manure & Wates Water Volumes

Facility	Manure	Wash	Flush	Bedding	Runoff	Solids Rem	Solids Sto	Total V
Total CF	153015	35880	0	0	0	0	0	188896

Storage Volumes (CF/Period)

	Holding Pond					Covered Stack					Uncovered Stack					Rect. Tank								Circular Tank				Pasture	Settling Basin	
Storage	Cell A	0	0	0	0	0%	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Period (M)	12.00																													
Period (D)	365	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Required Vol																														
CF	188896	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	1412372	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Designed Vol																														
CF	569566	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	4258644	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Extra																														
CF	380670	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GALLONS	2846272	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Storage Volumes	Required Vol CF	Required Vol GALLONS	Designed Vol CF	Designed Vol GALLONS	Extra CF
Total	188896	1412372	569566	4258644	380670

	AVAILABLE	REQUIRED
PASTURE 1 ACRES		0.0 ac

(FIGURES 0.25 IN COVER ON ENTIRE PASTURE)

Annual Storage Volumes Hauled

Type	UNITS	Volume
LIQUID	GAL	2,714,457
SOLID	TONS	0

(MANURE & PRECIP)

APPLICATION INFROMATION

TYPE	SIZE	UNITS	LOAD/HR	# LOADS	TIME
LIQUID	[illegible]	GAL	[illegible]	2354	40
SOLID	400	bu	2	0	0

Storage Volumes (CF/Period)

	Holding Pond					Covered Stack					Uncovered Stack					Rect. Tank								Circular Tank				Pasture	Settling Basin	
Storage	Cell A	0	0	0	0	0%	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Working	188895.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24 hr runoff	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
24 hr storm	104791.28	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
Precip	174145.46	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
Treatment	583976.18	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Residuals	360310.98	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
Freeboard	204869.33	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0			
Total	1997664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Gal to Haul	2714457.3	0	0	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	-		
Tons to Haul	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Annual gal	2714457.3	0	0	0	0											0	0	0	0	0	0	0	0	0	0	0	0			
Annual tons						0	0	0	0	0	0	0	0	0	0													0	0	0

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Mt. Erie
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Additional Waste Produced

Additions Data							
			Bedding				
Animals	Wash Gal/day	Flush Gal/day	Type	Rate lbs/d/A	Amount lbs/day	Density lb/CF	Amount CF/day
wine Lact. Sow	410				0	0	0.00
wine Gest. Sow	265				0	0	0.00
Swine Boar*	15				0	0	0.00
Swine Nursery*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
*					0	0	0.00
Parlor**						0	0.00
Sprinkler**	0					0	0.00
Waters**	0					0	0.00
Other**						0	0.00
Total	690				0		0.00

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

S:\238\2004 project numbers\23804009.11(Smithfield-NMP Updates)\AWM\2023\4088 Mt Erie MSI
AWM 2010 v14.2

MAURER-STUTZ

PROJECT: *Murphy-Brown, LLC. - Mt. Erie*
PROJECT NO.: *23804009.11*
COMPUTATION BY: *DNF* DATE: *1/9/23* SH. NO.: *1*
CHECKED BY: DATE: OF: *1*

Subject: *25yr Runoff Calculations*

Normal Runoff

Area = | Area = | Area =

	Concrete (CN=97)				Earth (CN=90)				Roof (CN=100)			
	Months	R	P	Total CF	Months	R	P	Total CF	Months	R	P	Total CF
X	JAN	0	2.47	0	JAN	0	2.47	0	JAN	100	2.5	0
X	FEB	0	2.57	0	FEB	0	2.57	0	FEB	100	2.6	0
X	MAR	0	4.01	0	MAR	0	4.01	0	MAR	100	4	0
X	APR	0	4.19	0	April	0	4.19	0	April	100	4.2	0
X	May	0	4.23	0	May	0	4.23	0	May	100	4.2	0
X	June	0	3.92	0	June	0	3.92	0	June	100	3.9	0
X	July	0	3.89	0	July	0	3.89	0	July	100	3.9	0
X	AUG	0	3.66	0	AUG	0	3.66	0	AUG	100	3.7	0
X	SEPT	0	3.22	0	SEPT	0	3.22	0	SEPT	100	3.2	0
X	OCT	0	3.12	0	OCT	0	3.12	0	OCT	100	3.1	0
X	NOV	0	4.19	0	NOV	0	4.19	0	NOV	100	4.2	0
X	DEC	0	3.22	0	DEC	0	3.22	0	DEC	100	3.2	0
	Total		42.7	0	Total			0	Total			0

Net Normal Ruoff = 0 CF

25 YR - 24HR Storm Event

Concrete (CN=97)			Earth (CN=90)			Roof (CN=100)		
CN	97		CN	90		CN	100	
S	0.31	in	S	1.11	in	S	0.00	in
I_{25}	5.79	in	I_{25}	5.79	in	I_{25}	5.79	in
Q_{25}	5.43	in	Q_{25}	4.64	in	Q_{25}	5.79	in
Vol_{25}	0.00	CF	Vol_{25}	0.00	CF	Vol_{25}	0.00	CF

25yr Storm Event Runoff = 0 CF

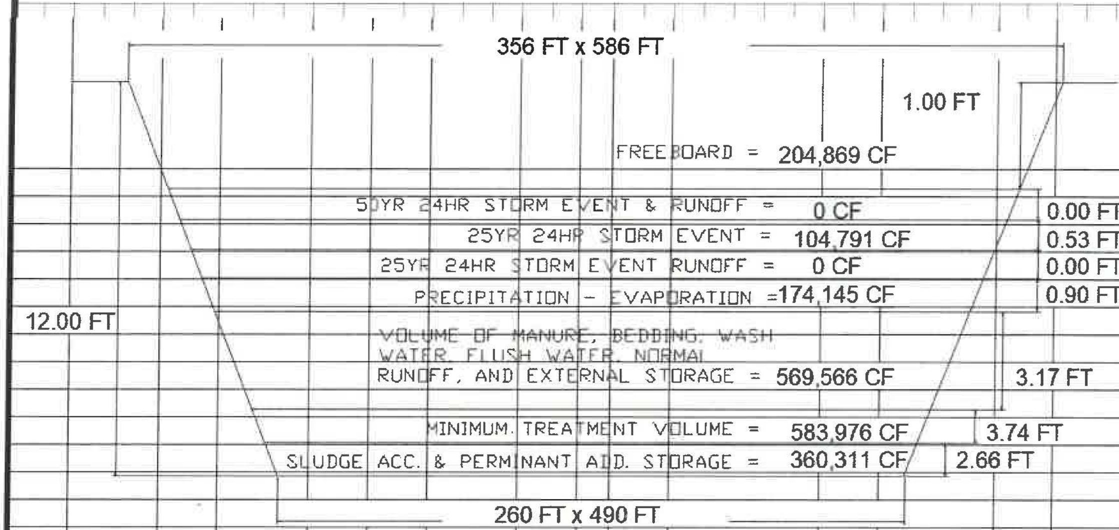
Notes

Concrete Areas: Earthen Areas: Roofed Areas:

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Mt. Erie
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Lagoon 1 Design Sheet, Cell A



EARTHEN STORAGE

TOTAL DEPTH	12.00 FT
FREEBOARD	1.00 FT
RESIDUAL SOLIDS	2.66 FT
MINIMUM TREATMENT	3.74 FT
PRECIP-EVAP DEPTH	0.90 FT
25 YR, 24-HR Runoff V	0 CF
25 YR, 24-HR Runoff D	0.00 FT
25 YR, 24-HR EFF	0.53 FT
50 YR, 24-HR Runoff V	0 CF
WORKING DEPTH	3.17 FT

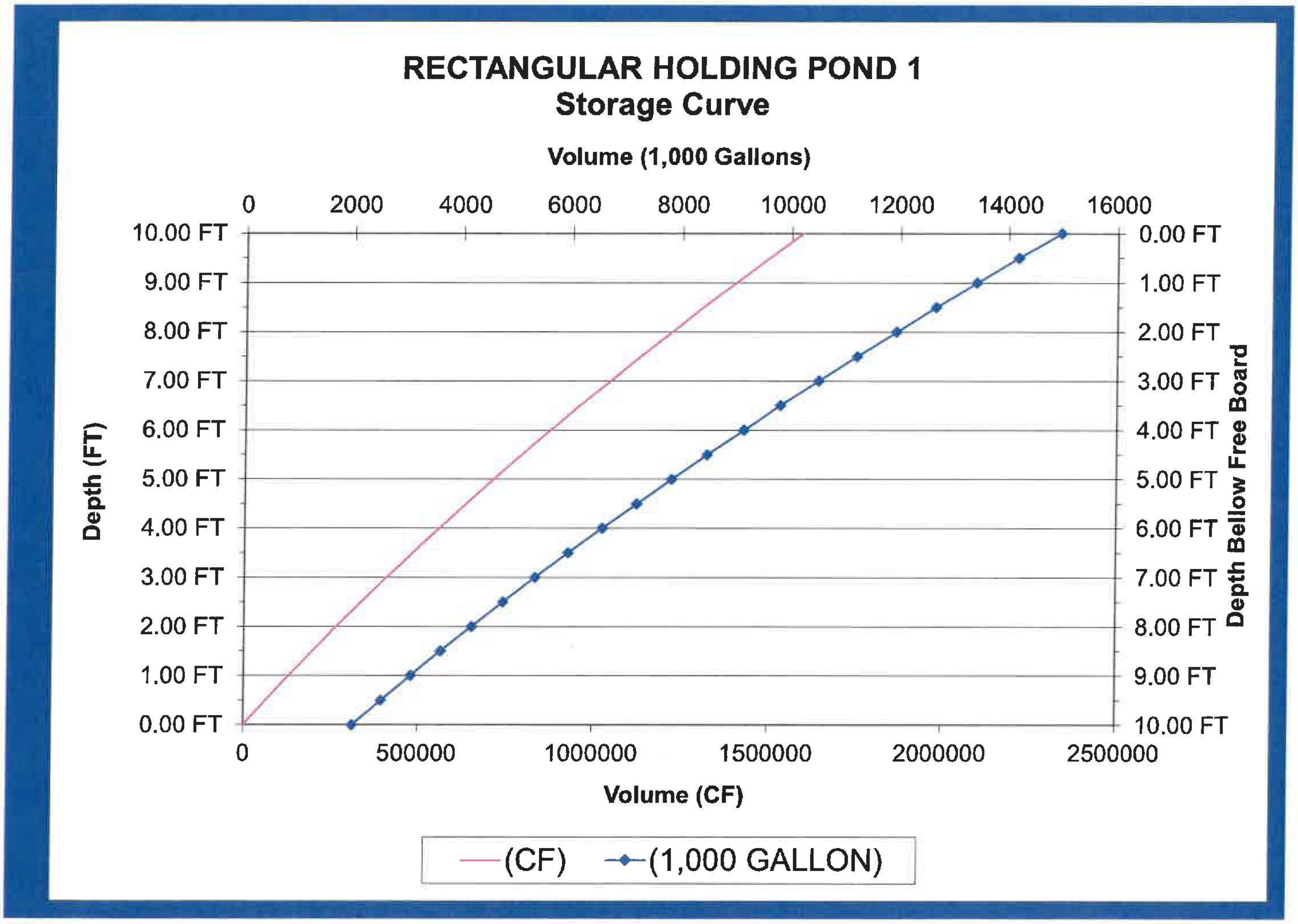
Deminsions	
BOTTOM WIDTH	260 FT
BOTTOM LENGTH	490 FT
INSIDE SLOPE	4.0 FT
TOP WIDTH	356 FT
TOP LENGTH	586 FT
START PUMPING	
STOP PUMPING	

50 YR, 24-HR VOL	0 CF	≈	0.00 MG
25 YR, 24-HR VOL	104,791 CF	≈	0.78 MG
PRECIP-EVAP VOL	174,145 CF	≈	1.30 MG
WORKING VOLUME	569,566 CF	≈	4.26 MG
MINIMUM TREATMENT	583,976 CF	≈	4.37 MG
RESIDUAL SOLIDS	360,311 CF	≈	2.69 MG
TOTAL RAMP VOL	0 CF	≈	0.00 MG
FREEBOARD	204,869 CF	≈	1.53 MG
TOTAL VOLUME	1,997,664 CF	≈	14.94 MG

ACTUAL PRECIP	42.7 in
ACTUAL EVAP	36.5 in
25 YR, 24-HR ACT	5.8 in
50 YR, 24-HR ACT	0.0 in

50 YR, 24-HR Runoff D	0.00 FT
50 YR, 24-HR EVENT D	0.00 FT

POND 1 - STAGE STORAGE				
TOTAL DEPTH	VOLUME (CF)	VOLUME (1,000 GALLON)	DEPTH BELOW	VOLUME (1,000 GAL / 1/2 FT)
12.00 FT	1997664	14937	0.00 FT	0.0
11.50 FT	1894295	14164	0.50 FT	772.9
11.00 FT	1792795	13405	1.00 FT	758.9
10.50 FT	1693146	12660	1.50 FT	745.1
10.00 FT	1595333	11928	2.00 FT	731.3
9.50 FT	1499341	11211	2.50 FT	717.7
9.00 FT	1405152	10506	3.00 FT	704.2
8.50 FT	1312751	9815	3.50 FT	690.9
8.00 FT	1222123	9138	4.00 FT	677.6
7.50 FT	1133250	8473	4.50 FT	664.5
7.00 FT	1046117	7822	5.00 FT	651.5
6.50 FT	960709	7183	5.50 FT	638.6
6.00 FT	877008	6557	6.00 FT	625.8
5.50 FT	794999	5944	6.50 FT	613.2
5.00 FT	714667	5344	7.00 FT	600.6
4.50 FT	635994	4755	7.50 FT	588.2
4.00 FT	558965	4179	8.00 FT	575.9
3.50 FT	483565	3616	8.50 FT	563.8
3.00 FT	409776	3064	9.00 FT	551.7
2.50 FT	337583	2524	9.50 FT	539.8
2.00 FT	266971	1996	10.00 FT	528.0
1.50 FT	197922	1480	10.50 FT	516.3
1.00 FT	130421	975	11.00 FT	504.7
0.50 FT	64453	482	11.50 FT	493.2
0.00 FT	0	0	12.00 FT	481.9
0.00 FT	0	0	12.00 FT	0.0
0.00 FT	0	0	12.00 FT	0.0
0.00 FT	0	0	12.00 FT	0.0
0.00 FT	0	0	12.00 FT	0.0
0.00 FT	0	0	12.00 FT	0.0
0.00 FT	0	0	12.00 FT	0.0
0.00 FT	0	0	12.00 FT	0.0


RECTANGULAR HOLDING POND 1
Storage Curve
Volume (1,000 Gallons)
0
2000
4000
6000
8000
10000
12000
14000
16000
10.00 FT
9.00 FT
8.00 FT
7.00 FT
6.00 FT
5.00 FT
4.00 FT
3.00 FT
2.00 FT
1.00 FT
0.00 FT
Depth (FT)
0.00 FT
1.00 FT
2.00 FT
3.00 FT
4.00 FT
5.00 FT
6.00 FT
7.00 FT
8.00 FT
9.00 FT
10.00 FT
Depth Bellow Free Board
0
500000
1000000
1500000
2000000
2500000
Volume (CF)
(CF)
(1,000 GALLON)

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Mt. Erie
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: NUTRIENTS AS EXCRETED

Liquid Manure							
				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine Lact. Sow*	100%	364	400	65.5		43.3	49.3
Swine Gest. Sow*	100%	1459	400	93.4		66.8	77.7
Swine Boar*	100%	4	325	0.2		0.1	0.1
Swine Nursery*	100%	3640	6	20.1		7.5	9.2
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				179	0	118	136

Solid Manure							
				Nutrients as Excreted			
				N	NH4-N	P2O5	K2O
Animals	%	Quantity	lbs	lbs/day	lbs/day	lbs/day	lbs/day
Swine Lact. Sow*	0%	364	400	0.0		0.0	0.0
Swine Gest. Sow*	0%	1459	400	0.0		0.0	0.0
Swine Boar*	0%	4	325	0.0		0.0	0.0
Swine Nursery*	0%	3640	6	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
*	0%	0	0	0.0		0.0	0.0
			gal	0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
				0.0		0.0	0.0
Total				0	0	0	0

Solid Totals (lbs)		lb/ton
N	0	#DIV/0!
P2O5	0	#DIV/0!
K2O	0	#DIV/0!

Liquid Totals (lbs)		lb/1000gal
N	65397	24
P2O5	43004	16
K2O	49785	18

Annual Totals (lbs)	
N	65397
P2O5	43004
K2O	49785

*Values calculated above are based on data from the Livestock Waste Facilities Handbook

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Mt. Erie
PROJECT NO.: 23804009.11
COMPUTATION BY: DNF DATE: 1/9/23 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: 4088 Mt. Erie Water Usage workshe

Building	Capacity
Lact	364
gest	1459
boar	4
Nusery	0
Truck	0
	1827

type	gpd/hd
cups	0.1
swinging nipples, Edstom	0.2
swinging nipples	0.3
regular nipples, Edstrom	0.4
regular nipples	0.6
wet/dry	0.1

Waterers (place a 1 on which type of waterers)

Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry
Lact						
gest						
boar						
Nusery						
Truck						

Building	cups	swinging nipples Edstrom	swinging nipples rest	regular nipples Edstrom	regular nipples rest	wet/dry	**total gpd**
Lact	0	0	0	0	0	0	**0.00**
gest	0	0	0	0	0	0	**0.00**
boar	0	0	0	0	0	0	**0.00**
Nusery	0	0	0	0	0	0	**0.00**
Truck	0	0	0	0	0	0	**0.00**

	Cleaning			**Presoak**				
Building	pressure washer gpm	cleaning interval weeks	time to clean hrs	time hr	flow gph	sprinklers #	usage gpd	**total gpd**
Lact	8	1	6	0	0	0	0.00	**410.30**
gest	10	13	40	0	0	0	0.00	**263.01**
boar	10	13	2	0	0	0	0.00	**13.15**
Nusery	0	1	0	0	0	0	0.00	**0.00**
Truck	0	1	0	0	0	0	0.00	**0.00**

total	**waterers**	**cleaning**	**total, gpd**
Lact	0.00	410.30	410.30
gest	0.00	263.01	263.01
boar	0.00	13.15	13.15
Nusery	0.00	0.00	0.00
Truck	0.00	0.00	0.00

2.5. Normal Mortality Management

To decrease non-point source pollution of surface and ground water resources, reduce the impact of odors that result from improperly handled animal mortality, and decrease the likelihood of the spread of disease or other pathogens, approved handling and utilization methods shall be implemented in the handling of normal mortality losses. If on-farm storage or handling of animal mortality is done, NRCS Standard 316, Animal Mortality Facility, will be followed for proper management of dead animals.

Plan for Proper Management of Dead Animals

The following table describes how you plan to manage normal animal mortality in a manner that protects surface and ground water quality.

1. Dead animals should be removed from building perimeters and not be visible to the occasional viewer.
2. Pickup sites should be properly fenced.
3. Refrigerated drop-off facilities should be properly maintained.
4. Dead animals should not remain in the pickup sites for more than 48 hours.
5. Carcass burners should be properly and regularly maintained.
6. Composting sites should be free of leachate and properly drained.
7. Composting facilities should be properly constructed and covered.
8. All dead animal facilities should be free of scavenger activity and insect infestations.
9. ***No evidence should be found of dead animals disposed of in manure storage containments.***
10. Present Dead animal disposal is composting

COMPOSTING FACILITY RECOMMEDATIONS - Swine

1. Precipitation should be diverted away from composting material and surface water shall be diverted away from the compost. Leachate shall be contained so as to not contaminate ground or surface water steams, ponds, or lakes.
2. The composting facility and mortalities should be protected from animals/predators and located on an impermeable base.
3. **Setbacks:**
   i. Stream, Private Potable water supply, well or other potable water supply source: 200 FT
   ii. Community water supply well: 200 to 400 FT (Section 14.2 of the Illinois Environmental Protection Act)
   iii. Residence: 200 feet except at a livestock management facility classified as a "new facility" as defined in the LMFA (510 ILCS 77/10.45) which shall be located at least ¼
4. Carbon Source Recommendations/Alternatives: Coarse sawmill sawdust, shredded cornstalks, chopped straw, coarse-ground corn cobs.
5. Carbon material that will be used for composting should be stored in such a way to prevent runoff.
6. It is expected that the carbon source will be required in the ratio of approximately one cubic foot of carbon source per ten pounds of carcass (3.7 cubic yards of carbon source per 1000 pounds of carcass). The composter shall have primary and secondary bins sized based on the farm's projected mortality. Target a range for carbon: nitrogen (C:N) ratio between 40:1 and 25:1.
7. Each bin shall have a layer of carbon source of at least 10" between the carcass and bin walls/floor in addition to a minimum 10" covering over and around each carcass. Add additional carbon source as needed to maintain cover.
8. A compost thermometer with a probe at least 36" long shall be obtained and used daily to measure the temperature of the compost in the middle of each bin.
9. The compost temperature should reach 135 to 160° F. (57° to 71° C.) and be recorded daily. If compost does not reach at least 135° F, the compost shall be stirred/turned to add air, and moisture content adjusted (typically in the range of 40% and 60% moisture). Adequate air and moisture content are the two most important parameters for proper aerobic composting.
10. After the compost temperature peaks and falls below 130° F, it is ready for the secondary bin. Compost shall remain in the secondary bin for the duration of the secondary composting cycle (typically three months). Temperature of the compost shall be measured using the compost thermometer to monitor the composting process with a peak over 135° F and being finished when temperature falls below 130° F.
11. Finished compost shall be agronomically distributed over pasture or cropland or reused in the composting process. Finished compost should be returned to the primary composting bin to help inoculate proper aerobic bacteria in the ratio of up to 50 percent finished compost to fresh carbon source.
12. Records of carcass additions, composter operation and land application of finished compost shall be maintained on the premises.

Mortality Disposal Operations

Form 3-D

☐ If a rendering service is used, completely describe how often they pick up, where mortalities are kept until pick up, security, etc. **Use Forms 3-F and 3-G** to record mortalities.

☒ If mortalities are composted, completely describe (how constructed - dimensions, roof, floor, material used, etc.) composting operation and the facilities operation and maintenance, including daily activities, temperature readings, approximate pounds of mortalities per month, location of compost site, carbon source, recipe, etc. **Use Forms 3-F and 3-G** to record mortalities.

ROOFED MORTALITY COMPOSTER LOCATED AT LAKESIDE FARM. ALL MORTALITIES COMPOSTED HERE.

☐ If an incinerator is used, provide a complete description of the operation and maintenance of the incinerator, including approximate pounds per month incinerated and location of the incinerator. Also include a copy of the IEPA incinerator approval, etc. **Use Forms 3-F and 3-G** to record mortalities.

☐ If burial is used provide a complete description of procedures including location of past and current burial sites (map showing the sites should be included), how many pounds are buried at each site, field drainage, water table, etc. **Use Forms 3-F and 3-G** to record mortalities.

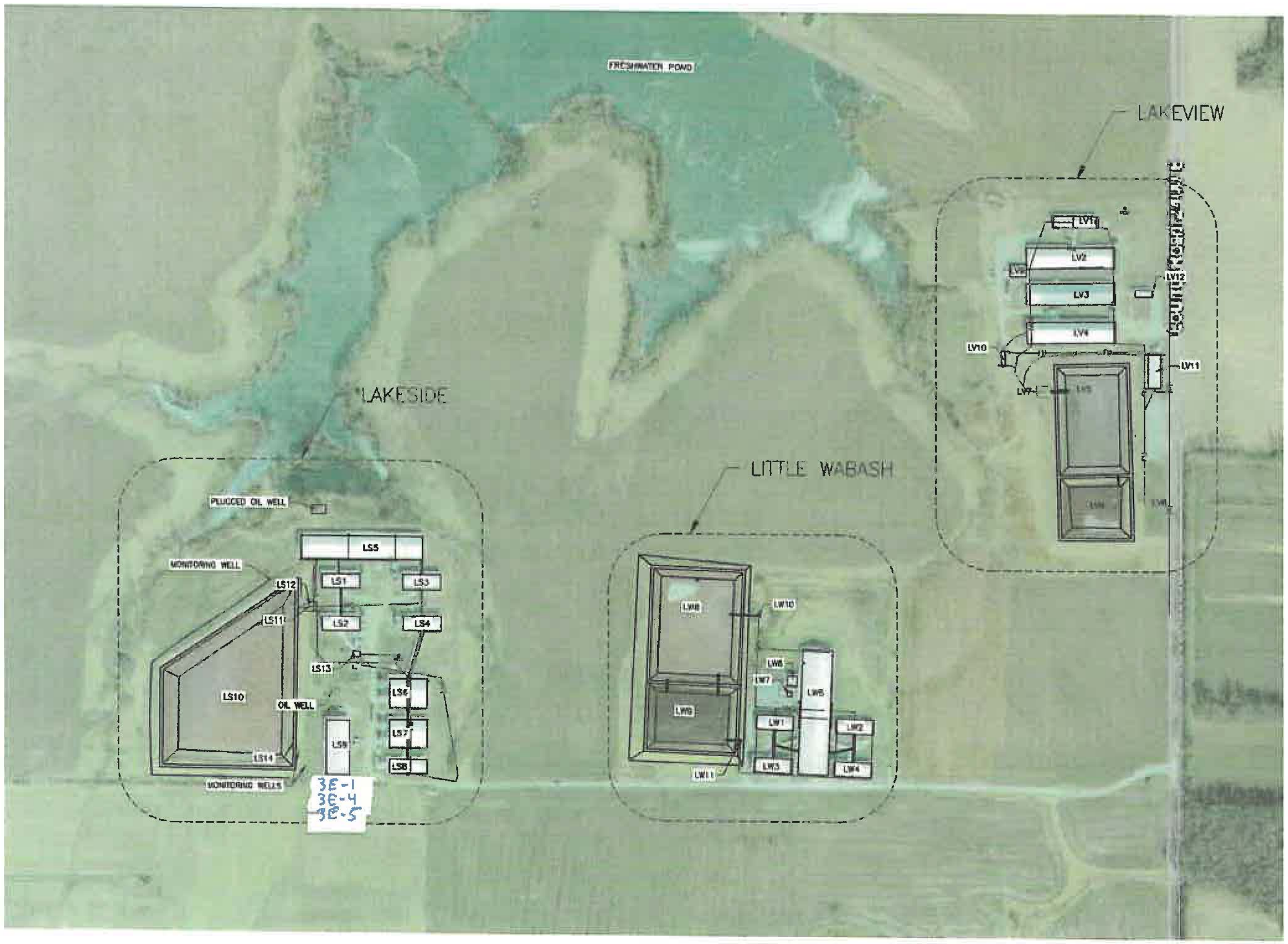
Mortality Discharge Prevention Best Management Practices

Form 3-E

Mark those BMP's listed below that are applicable to any part of your operation.

Y	N	NA	Map Legend*	Practices
	☒	☐	3E-1	**Location**—The facility is down gradient (slope) from all springs and/or wells.
☒	☐	☐	3E-1	**Location**—The animal mortality facility is located outside the 100-year floodplain.
☐	☒	☐	3E-1	**Location**—Due to site restrictions, the facility is within a floodplain, and the facility is protected from inundation or damage.
☒	☐	☐	3E-1	**Location**—The facility is located as close to the source of mortality as practical, considering bio-security issues and the need to keep the facility out of sight of the general public.
☐	☐	☒	3E-1 concrete	**Liner**—Seepage from mortality facilities could create a potential water quality problem, and a clay liner or other acceptable liner technology is used beneath the facility to contain seepage.
☐	☐	☐	3E-2	**Freezers**—Freezer units are sized to accommodate the normal maximum volume of mortality to be expected in the interval between emptying. Freezer volume includes the expected mortality rate of the animal, the period of time between emptying where mortality is given on a per day basis, the average weight of the animal between emptying, and a conversion factor for weight to volume. Capacity calculations are supported by a removal schedule supplied by an integrator or approved vendor.
☐	☐	☐	3E-3	**Incinerators**—Incinerator is dual burning Type 4 (human and animal remains) approved for use within the state. Permit for operation (IEPA Bureau of Air) is on file at the site.
☐	☐	☐	3E-3	**Incinerators**—Minimum incinerator capacity is based on the average daily weight of animal mortality and the length of time the incinerator will be operated each day.
☐	☐	☐	3E-3	**Incinerators**—Incineration ash is properly handled so as not to cause pollution.
☐	☐	☐	3E-3	**Incinerators**—Ground under incinerator is managed to prevent storm water runoff, either by berms or containment of that runoff.
☐	☐	☒		**Runoff**—All mortality areas are managed to prevent storm water runoff, either by using berms or containment of that runoff.
☒	☐	☐		**Roofs**—Facility has a roof to manage storm water and prevent storm water from entering mortality management area.
☒	☐	☐		**Inspection and maintenance**—At each operation or use, the animal mortality facility is inspected to note any maintenance needs or indicators of operation problems.
☒	☐	☐		**Biosecurity**—Biosecurity concerns are addressed in all aspects of planning, installation, and operation and maintenance of the animal mortality facility.
☒	☐	☐	3E-4	**Visual screens**—Vegetative screens, topography, and buildings are used to shield the animal disposal facility from public view and to minimize visual impact.
☒	☐	☐	3E-5	**Safety**—Safety devices such as fencing, warning signs, and freezer locks are in place where appropriate.
☐	☐	☐	3E-6	**Other (list)**

* Mark the map legend codes on facility/production area maps where appropriate.



LEGEND

- GRAVITY MANURE TRANSFER PIPE
- PRESSURE MANURE TRANSFER PIPE
- AERIAL ELECTRIC LINE
- WATER LINE

N

0 200' 400'
BAR SCALE IN FEET

LAKE SIDE

EXISTING FACILITY DETAILS

ITEM	FACILITY DESCRIPTION
LS1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS5	EXISTING SWINE BUILDING W/2' SHALLOW PIT
LS6	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS7	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS8	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS9	MORTALITY COMPOSTER
LS10	EARTHEN LAGOON
LS11	RECEPTION SUMP LIFT STATION (6'ø)
LS12	RECEPTION SUMP LIFT STATION (7'ø)
LS13	OFFICE
LS14	RECYCLE LIFT STATION (6'ø)

LITTLE WABASH

EXISTING FACILITY DETAILS

ITEM	FACILITY DESCRIPTION
LW1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW5	EXISTING SWINE BUILDING W/2' SHALLOW PIT
LW6	OFFICE
LW7	GENERATOR BUILDING
LW8	EARTHEN LAGOON (CELL A)
LW9	EARTHEN LAGOON (CELL B)
LW10	RECEPTION SUMP LIFT STATION (6'ø)
LW11	RECYCLE LIFT STATION (6'ø)
E17	OFFICE
E18	GENERATOR SHED

LAKEVIEW

EXISTING FACILITY DETAILS

ITEM	FACILITY DESCRIPTION
LV1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV5	EARTHEN LAGOON (CELL A)
LV6	EARTHEN LAGOON (CELL B)
LV7	RECEPTION SUMP LIFT STATION (6'ø)
LV8	RECYCLE LIFT STATION (6'ø)
LV9	OFFICE
LV10	BOAR ISOLATION W/ 9" SHALLOW PIT
LV11	DEPOT - LOAD/UNLOAD
LV12	OFFICE

SCALE VALID ONLY ON
22"x34" SIZE PLANS

PRELIMINARY

MAURER-STUTZ
ENGINEERS SURVEYORS

SHEET TITLE: SITE PLAN

PROJECT: MT. ERIE SOW FARM

CLIENT: SMITHFIELD HOG PRODUCTION

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C102

2.6. Planned Manure Exports off the Farm

All Manure and Process wastewater is transferred off-site.
(See Nutrient Management Plan Section 6).

2.7. Planned Manure Imports onto the Farm

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

(None)

2.8. Planned Internal Transfers of Manure

Month-Year	Manure Source	Amount	Manure Destination

(None)

2.9. General Facility Operation and Management Recommendations:

1. Observe and record Freeboard on all open containments on a weekly basis.
2. Inspect and maintain all earthen structures, dikes, and piping.
3. Plan pumping windows to avoid inopportune application.
4. Avoid full containments during early spring.
5. Size removal equipment to complete pumping in as few days as possible.
6. Agitate containments during all hauling events.
7. Observe all safety rules when agitating and hauling manure.
8. Do not pump containments intermittently -- start and finish as quickly as possible. One-week maximum for recharge systems.
9. Apply highest nutrient content manure to the furthest site.
10. Schedule custom applications well in advance.
11. Enforce all application, records, and testing protocols.
12. Install windbreaks and maintain a well-manicured farmstead appearance.
13. Observe and maintain all containment dilution and treatment volumes.
14. Pump storage/lagoon before or when pump down stake is reached.
15. Never leave pumping operations unattended.
16. Fill lagoons with fresh water to minimum treatment volume. Add at least two feet of fresh water to earthen storage after construction.
17. Observe perimeter drain inspection ports for evidence of containment seepage.
18. Be sure exposed pit walls are not cracked and leaking.
19. Assure all pump-out covers are in good repair and in place at all times.
20. No evidence of medical or bio-hazardous waste should be found in manure storage containments. (Rubber gloves, pipettes, bottles, needle holders, etc.)

2.10. Stormwater Management:

Elm River

Storm Water Pollution Prevention Plan

Form 3-B

Y	N	NA	Map Legend*	Physical Structures
☐	☐	☒	3B-1	**Collection basins**—Permanent structures in which large spills or contaminated storm water is contained and stored before cleanup or treatment. Collection basins are designed to receive spills, leaks, etc., and to prevent pollutants from being released into the environment. Collection basins can receive and contain materials from many locations across a facility.
☐	☐	☒	3B-2	**Curbing**—A barrier that surrounds an area of concern. Unlike diking, curbing is unable to contain large spills and is usually implemented on a small-scale basis. However, curbing is common at many facilities and in small areas where liquids are handled and transferred.
☐	☐	☒	3B-3	**Containment diking**—Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking can be used at any facility, but is most common for controlling large spills or releases from liquid storage and transfer areas. Diking can provide one of the best protective measures against the contamination of storm water because it surrounds the area of concern and keeps spilled materials separated from the storm water outside of the diked area.
☐	☐	☒	3B-4	**Diversions**—A diversion is a channel constructed across the slope, generally with a supporting ridge on the lower side, for the purpose of changing the direction of flow of storm water.
☐	☐	☒	3B-5	**Dry extended detention ponds**—Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the storm water runoff from a water quality design storm for some minimum time (e.g., 24 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. However, they are often designed with small pools at the inlet and outlet of the basin. They can also be used to provide flood control by including additional flood detention storage.
☒	☐	☐	3B-6	**Wet ponds**—Wet ponds (a.k.a. storm water ponds, retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season). Ponds treat incoming storm water runoff by settling and algal uptake. The primary removal mechanism is settling as storm water runoff resides in this pool, and pollutant uptake, particularly of nutrients, also occurs through biological activity in the pond.
☐	☐	☒	3B-7	**Infiltration basin**—An infiltration basin is a shallow impoundment that is designed to infiltrate storm water into the ground water. This practice is believed to have a high pollutant removal efficiency and can help recharge the ground water, thus restoring low flows to stream systems.
☐	☐	☒	3B-8	**Infiltration trench**—An infiltration trench (a.k.a. infiltration galley) is a rock-filled trench with no outlet that receives storm water runoff. Storm water runoff passes through some combination of pretreatment measures, such as a swale and detention basin, and into the trench. There, runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. The primary pollutant removal mechanism of this practice is filtering through the soil.
☐	☐	☒	3B-9	**Storm water wetland**—Storm water wetlands (a.k.a. constructed wetlands) are structural practices similar to wet ponds that incorporate wetland plants into the design. As storm water runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake within the practice. Storm water wetlands are designed specifically for the purpose of treating storm water runoff, and typically have less biodiversity than natural wetlands in terms of both plant and animal life.

☐	☐	☒	3B-10	**Grassed waterways/swales**—A series of vegetated, open channel management practices designed specifically to treat and attenuate storm water runoff for a specified water quality volume. As storm water runoff flows through these channels, it is treated through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Variations of the grassed swale include the grassed channel, dry swale, and wet swale.
☐	☐	☒	3B-11	**Grassed filter strip**—Grassed filter strips (vegetated filter strips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. Filter strips function by slowing runoff velocities and filtering out sediment and other pollutants, and by providing some infiltration into underlying soils.
☐	☐	☒	3B-12	**Catch basin**—A catch basin (a.k.a. storm drain inlet, curb inlet) is an inlet to the storm drain system that typically includes a grate or curb inlet and a sump to capture sediment, debris, and associated pollutants. They are also used in combined sewer overflow (CSO) watersheds to capture floatables and settle some solids. Catch basins act as pretreatment for other treatment practices by capturing large sediments.
☐	☐	☒	3B-13	**In-line storage**—In-line storage refers to a number of practices designed to use the storage within the storm drain system to detain flows. Storage is achieved by placing devices in the storm drain system to restrict the rate of flow. Devices can slow the rate of flow by backing up flow, as in the case of a dam or weir, or through the use of vortex valves, devices that reduce flow rates by creating a helical flow path in the structure.
☐	☐	☒	3B-14	**Other practices**

* Mark the map legend codes on facility/production area maps where appropriate.

Facility/Production Area Storm Water Pollution Prevention Plan

Form 3-C

Mark those BMP's listed below that are applicable to any part of your operation.

Y	N	NA	Map Legend	Management/Operational Practices
				Diversions (Terrace-like structures can also function as diversions.)
☐	☐	☒		Temporary diversions are used only where the drainage area is less than 5 acres.
☐	☐	☒		Diversions that are part of a pollution abatement system have a minimum capacity for the peak discharge from a 10-year frequency, 24-hour duration storm.
☐	☐	☒		Diversions designed to protect areas such as buildings, roads, and animal waste management systems have a minimum capacity for the peak discharge from a storm frequency consistent with the hazard involved but not less than a 25-year frequency, 24-hour duration storm. Freeboard is not less than 0.3 ft.
☐	☐	☒		The location of a diversion and outlet is in compliance with applicable state drainage and water conveyance laws.** Diversions do not outlet on public roads, highways, or other public utility, or the written approval of the appropriate authorities has been obtained.
☐	☐	☒		Where movement of sediment into the channel can be a problem, the design includes extra capacity for sediment or periodic removal; and where applicable, such sediment removal is outlined in the operation and maintenance plan.
☐	☐	☒		The outlet conveys runoff to a point where outflow will not cause damage.
☐	☐	☒		Periodic inspections, especially immediately following significant storms, are performed. Damaged components of the diversion are promptly repaired or replaced as necessary.
☐	☐	☒		Diversion capacity, ridge height, and outlet elevations are maintained, especially where high sediment yielding areas are in the drainage area above the diversion.
☐	☐	☒		Each inlet for underground outlets is kept clean and sediment buildup redistributed so that the inlet is at the lowest point.
☐	☐	☒		Sediment is redistributed as necessary to maintain the capacity of the diversion.
☒	☐	☐		Vegetation on diversions is maintained and trees and brush controlled by hand, chemical and/or mechanical means.
☒	☐	☐		Machinery is kept away from steep sloped ridges. Equipment operators are informed of all potential hazards.
☐	☐	☒	3C-1	**Hazardous materials storage**—Proper storage of hazardous materials. Practices such as covering hazardous materials, or even storing them properly, can have dramatic impacts.
☐	☐	☒	3C-2	**Fueling areas**—Absorbent used for fueling areas will be packaged in small bags for convenient use and small drums will be available for storage. Absorbent materials will not be washed down the floor drain or into the storm sewer.

☐	☐	☒	3C-3	**Chemical spills**—Emergency spill containment and cleanup kits will be located at the facility site. The contents of the kit will be appropriate to the type and quantities of chemical or goods stored at the facility.
☐	☐	☒	3C-4	**Other practices** (describe)

** See *Illinois Drainage Law Part 1* on the Workbook CD for details on landowner rights and responsibilities regarding drainage.

Diversion - NRCS Practice Standard Code 362, Roof Runoff Structure - NRCS Practice Standard Code 558

Lakeside

Storm Water Pollution Prevention Plan

Form 3-B

Y	N	NA	Map Legend*	Physical Structures
☐	☐	☒	3B-1	**Collection basins**—Permanent structures in which large spills or contaminated storm water is contained and stored before cleanup or treatment. Collection basins are designed to receive spills, leaks, etc., and to prevent pollutants from being released into the environment. Collection basins can receive and contain materials from many locations across a facility.
☐	☐	☒	3B-2	**Curbing**—A barrier that surrounds an area of concern. Unlike diking, curbing is unable to contain large spills and is usually implemented on a small-scale basis. However, curbing is common at many facilities and in small areas where liquids are handled and transferred.
☐	☐	☒	3B-3	**Containment diking**—Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking can be used at any facility, but is most common for controlling large spills or releases from liquid storage and transfer areas. Diking can provide one of the best protective measures against the contamination of storm water because it surrounds the area of concern and keeps spilled materials separated from the storm water outside of the diked area.
☐	☐	☒	3B-4	**Diversions**—A diversion is a channel constructed across the slope, generally with a supporting ridge on the lower side, for the purpose of changing the direction of flow of storm water.
☐	☐	☒	3B-5	**Dry extended detention ponds**—Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the storm water runoff from a water quality design storm for some minimum time (e.g., 24 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. However, they are often designed with small pools at the inlet and outlet of the basin. They can also be used to provide flood control by including additional flood detention storage.
☒	☐	☐	3B-6	**Wet ponds**—Wet ponds (a.k.a. storm water ponds, retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season). Ponds treat incoming storm water runoff by settling and algal uptake. The primary removal mechanism is settling as storm water runoff resides in this pool, and pollutant uptake, particularly of nutrients, also occurs through biological activity in the pond.
☐	☐	☒	3B-7	**Infiltration basin**—An infiltration basin is a shallow impoundment that is designed to infiltrate storm water into the ground water. This practice is believed to have a high pollutant removal efficiency and can help recharge the ground water, thus restoring low flows to stream systems.
☐	☐	☒	3B-8	**Infiltration trench**—An infiltration trench (a.k.a. infiltration galley) is a rock-filled trench with no outlet that receives storm water runoff. Storm water runoff passes through some combination of pretreatment measures, such as a swale and detention basin, and into the trench. There, runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. The primary pollutant removal mechanism of this practice is filtering through the soil.
☐	☐	☒	3B-9	**Storm water wetland**—Storm water wetlands (a.k.a. constructed wetlands) are structural practices similar to wet ponds that incorporate wetland plants into the design. As storm water runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake within the practice. Storm water wetlands are designed specifically for the purpose of treating storm water runoff, and typically have less biodiversity than natural wetlands in terms of both plant and animal life.

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☐	☐	☒	3B-11	**Grassed filter strip**—Grassed filter strips (vegetated filter strips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. Filter strips function by slowing runoff velocities and filtering out sediment and other pollutants, and by providing some infiltration into underlying soils.
☐	☐	☒	3B-12	**Catch basin**—A catch basin (a.k.a. storm drain inlet, curb inlet) is an inlet to the storm drain system that typically includes a grate or curb inlet and a sump to capture sediment, debris, and associated pollutants. They are also used in combined sewer overflow (CSO) watersheds to capture floatables and settle some solids. Catch basins act as pretreatment for other treatment practices by capturing large sediments.
☐	☐	☒	3B-13	**In-line storage**—In-line storage refers to a number of practices designed to use the storage within the storm drain system to detain flows. Storage is achieved by placing devices in the storm drain system to restrict the rate of flow. Devices can slow the rate of flow by backing up flow, as in the case of a dam or weir, or through the use of vortex valves, devices that reduce flow rates by creating a helical flow path in the structure.
☐	☐	☒	3B-14	**Other practices**

* Mark the map legend codes on facility/production area maps where appropriate.

Facility/Production Area Storm Water Pollution Prevention Plan

Form 3-C

Mark those BMP's listed below that are applicable to any part of your operation.

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☐	☐	☒		Vegetation on diversions is maintained and trees and brush controlled by hand, chemical and/or mechanical means.
☒	☐	☐		Machinery is kept away from steep sloped ridges. Equipment operators are informed of all potential hazards.
☐	☐	☒	3C-1	**Hazardous materials storage**—Proper storage of hazardous materials. Practices such as covering hazardous materials, or even storing them properly, can have dramatic impacts.
☐	☐	☒	3C-2	**Fueling areas**—Absorbent used for fueling areas will be packaged in small bags for convenient use and small drums will be available for storage. Absorbent materials will not be washed down the floor drain or into the storm sewer.

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Diversion - NRCS Practice Standard Code 362, Roof Runoff Structure - NRCS Practice Standard Code 558

Lakeview

Storm Water Pollution Prevention Plan

Form 3-B

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☐	☐	☒	3B-14	**Other practices**

* Mark the map legend codes on facility/production area maps where appropriate.

Facility/Production Area Storm Water Pollution Prevention Plan

Form 3-C

Mark those BMP's listed below that are applicable to any part of your operation.

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				Diversions (Terrace–like structures can also function as diversions.)
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☒	☐	☐		Machinery is kept away from steep sloped ridges. Equipment operators are informed of all potential hazards.
☐	☐	☒	3C-1	**Hazardous materials storage**—Proper storage of hazardous materials. Practices such as covering hazardous materials, or even storing them properly, can have dramatic impacts.
☐	☐	☒	3C-2	**Fueling areas**—Absorbent used for fueling areas will be packaged in small bags for convenient use and small drums will be available for storage. Absorbent materials will not be washed down the floor drain or into the storm sewer.

☐	☐	☒	3C-3	**Chemical spills**—Emergency spill containment and cleanup kits will be located at the facility site. The contents of the kit will be appropriate to the type and quantities of chemical or goods stored at the facility.
☐	☐	☒	3C-4	**Other practices** (describe)

** See *Illinois Drainage Law Part 1* on the Workbook CD for details on landowner rights and responsibilities regarding drainage.

Diversion - NRCS Practice Standard Code 362, Roof Runoff Structure - NRCS Practice Standard Code 558

Little Wabash

Form 3-B

Storm Water Pollution Prevention Plan

Y	N	NA	Map Legend*	Physical Structures
☐	☐	☒	3B-1	**Collection basins**—Permanent structures in which large spills or contaminated storm water is contained and stored before cleanup or treatment. Collection basins are designed to receive spills, leaks, etc., and to prevent pollutants from being released into the environment. Collection basins can receive and contain materials from many locations across a facility.
☐	☐	☒	3B-2	**Curbing**—A barrier that surrounds an area of concern. Unlike diking, curbing is unable to contain large spills and is usually implemented on a small-scale basis. However, curbing is common at many facilities and in small areas where liquids are handled and transferred.
☐	☐	☒	3B-3	**Containment diking**—Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking can be used at any facility, but is most common for controlling large spills or releases from liquid storage and transfer areas. Diking can provide one of the best protective measures against the contamination of storm water because it surrounds the area of concern and keeps spilled materials separated from the storm water outside of the diked area.
☐	☐	☒	3B-4	**Diversions**—A diversion is a channel constructed across the slope, generally with a supporting ridge on the lower side, for the purpose of changing the direction of flow of storm water.
☐	☐	☒	3B-5	**Dry extended detention ponds**—Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the storm water runoff from a water quality design storm for some minimum time (e.g., 24 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. However, they are often designed with small pools at the inlet and outlet of the basin. They can also be used to provide flood control by including additional flood detention storage.
☒	☐	☐	3B-6	**Wet ponds**—Wet ponds (a.k.a. storm water ponds, retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season). Ponds treat incoming storm water runoff by settling and algal uptake. The primary removal mechanism is settling as storm water runoff resides in this pool, and pollutant uptake, particularly of nutrients, also occurs through biological activity in the pond.
☐	☐	☒	3B-7	**Infiltration basin**—An infiltration basin is a shallow impoundment that is designed to infiltrate storm water into the ground water. This practice is believed to have a high pollutant removal efficiency and can help recharge the ground water, thus restoring low flows to stream systems.
☐	☐	☒	3B-8	**Infiltration trench**—An infiltration trench (a.k.a. infiltration galley) is a rock-filled trench with no outlet that receives storm water runoff. Storm water runoff passes through some combination of pretreatment measures, such as a swale and detention basin, and into the trench. There, runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. The primary pollutant removal mechanism of this practice is filtering through the soil.
☐	☐	☒	3B-9	**Storm water wetland**—Storm water wetlands (a.k.a. constructed wetlands) are structural practices similar to wet ponds that incorporate wetland plants into the design. As storm water runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake within the practice. Storm water wetlands are designed specifically for the purpose of treating storm water runoff, and typically have less biodiversity than natural wetlands in terms of both plant and animal life.

☒	☐	☐	3B-10	**Grassed waterways/swales**—A series of vegetated, open channel management practices designed specifically to treat and attenuate storm water runoff for a specified water quality volume. As storm water runoff flows through these channels, it is treated through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Variations of the grassed swale include the grassed channel, dry swale, and wet swale.
☐	☐	☒	3B-11	**Grassed filter strip**—Grassed filter strips (vegetated filter strips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. Filter strips function by slowing runoff velocities and filtering out sediment and other pollutants, and by providing some infiltration into underlying soils.
☒	☐	☐	3B-12	**Catch basin**—A catch basin (a.k.a. storm drain inlet, curb inlet) is an inlet to the storm drain system that typically includes a grate or curb inlet and a sump to capture sediment, debris, and associated pollutants. They are also used in combined sewer overflow (CSO) watersheds to capture floatables and settle some solids. Catch basins act as pretreatment for other treatment practices by capturing large sediments.
☐	☐	☒	3B-13	**In-line storage**—In-line storage refers to a number of practices designed to use the storage within the storm drain system to detain flows. Storage is achieved by placing devices in the storm drain system to restrict the rate of flow. Devices can slow the rate of flow by backing up flow, as in the case of a dam or weir, or through the use of vortex valves, devices that reduce flow rates by creating a helical flow path in the structure.
☐	☐	☐	3B-14	**Other practices**

* Mark the map legend codes on facility/production area maps where appropriate.

Facility/Production Area Storm Water Pollution Prevention Plan

Form 3-C

Mark those BMP's listed below that are applicable to any part of your operation.

Y	N	NA	Map Legend	Management/Operational Practices
				Diversions (Terrace–like structures can also function as diversions.)
☐	☐	☒		Temporary diversions are used only where the drainage area is less than 5 acres.
☐	☐	☒		Diversions that are part of a pollution abatement system have a minimum capacity for the peak discharge from a 10-year frequency, 24-hour duration storm.
☐	☐	☒		Diversions designed to protect areas such as buildings, roads, and animal waste management systems have a minimum capacity for the peak discharge from a storm frequency consistent with the hazard involved but not less than a 25-year frequency, 24-hour duration storm. Freeboard is not less than 0.3 ft.
☒	☐	☐		The location of a diversion and outlet is in compliance with applicable state drainage and water conveyance laws.** Diversions do not outlet on public roads, highways, or other public utility, or the written approval of the appropriate authorities has been obtained.
☐	☐	☒		Where movement of sediment into the channel can be a problem, the design includes extra capacity for sediment or periodic removal; and where applicable, such sediment removal is outlined in the operation and maintenance plan.
☒	☐	☐		The outlet conveys runoff to a point where outflow will not cause damage.
☒	☐	☐		Periodic inspections, especially immediately following significant storms, are performed. Damaged components of the diversion are promptly repaired or replaced as necessary.
☒	☐	☐		Diversion capacity, ridge height, and outlet elevations are maintained, especially where high sediment yielding areas are in the drainage area above the diversion.
☒	☐	☐		Each inlet for underground outlets is kept clean and sediment buildup redistributed so that the inlet is at the lowest point.
☐	☐	☐		Sediment is redistributed as necessary to maintain the capacity of the diversion.
☒	☐	☐		Vegetation on diversions is maintained and trees and brush controlled by hand, chemical and/or mechanical means.
☒	☐	☐		Machinery is kept away from steep sloped ridges. Equipment operators are informed of all potential hazards.
☐	☐	☒	3C-1	**Hazardous materials storage**—Proper storage of hazardous materials. Practices such as covering hazardous materials, or even storing them properly, can have dramatic impacts.
☐	☐	☒	3C-2	**Fueling areas**—Absorbent used for fueling areas will be packaged in small bags for convenient use and small drums will be available for storage. Absorbent materials will not be washed down the floor drain or into the storm sewer.

☐	☐	☒	3C-3	**Chemical spills**—Emergency spill containment and cleanup kits will be located at the facility site. The contents of the kit will be appropriate to the type and quantities of chemical or goods stored at the facility.
☐	☐	☒	3C-4	**Other practices** (describe)

** See *Illinois Drainage Law Part 1* on the Workbook CD for details on landowner rights and responsibilities regarding drainage.

Diversion - NRCS Practice Standard Code 362, Roof Runoff Structure - NRCS Practice Standard Code 558

Mt. Erie

Storm Water Pollution Prevention Plan

Form 3-B

Y	N	NA	Map Legend*	Physical Structures
☐	☐	☒	3B-1	**Collection basins**—Permanent structures in which large spills or contaminated storm water is contained and stored before cleanup or treatment. Collection basins are designed to receive spills, leaks, etc., and to prevent pollutants from being released into the environment. Collection basins can receive and contain materials from many locations across a facility.
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☐	☐	☒	3B-14	**Other practices**

* Mark the map legend codes on facility/production area maps where appropriate.

Facility/Production Area Storm Water Pollution Prevention Plan

Form 3-C

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☐	☐	☒		The outlet conveys runoff to a point where outflow will not cause damage.
☐	☐	☒		Periodic inspections, especially immediately following significant storms, are performed. Damaged components of the diversion are promptly repaired or replaced as necessary.
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☐	☐	☒		Sediment is redistributed as necessary to maintain the capacity of the diversion.
☒	☐	☐		Vegetation on diversions is maintained and trees and brush controlled by hand, chemical and/or mechanical means.
☒	☐	☐		Machinery is kept away from steep sloped ridges. Equipment operators are informed of all potential hazards.
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☐	☐	☒	3C-2	**Fueling areas**—Absorbent used for fueling areas will be packaged in small bags for convenient use and small drums will be available for storage. Absorbent materials will not be washed down the floor drain or into the storm sewer.

☐	☐	☒	3C-3	**Chemical spills**—Emergency spill containment and cleanup kits will be located at the facility site. The contents of the kit will be appropriate to the type and quantities of chemical or goods stored at the facility.
☐	☐	☒	3C-4	**Other practices (describe)**

** See *Illinois Drainage Law Part 1* on the Workbook CD for details on landowner rights and responsibilities regarding drainage.

Diversion - NRCS Practice Standard Code 362, Roof Runoff Structure - NRCS Practice Standard Code 558

LEGEND

——BAR—— GRAVITY MANURE TRANSFER PIPE
——PM—— PRESSURE MANURE TRANSFER PIPE
——(AE)—— AERIAL ELECTRIC LINE
——W—— WATER LINE

N

0 200' 400'
BAR SCALE IN FEET

LAKE SIDE

EXISTING FACILITY DETAILS

ITEM	FACILITY DESCRIPTION
LS1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LS5	EXISTING SWINE BUILDING W/2' SHALLOW PIT
LS6	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS7	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS8	EXISTING SWINE BUILDING W/20" SHALLOW PIT
LS9	MORTALITY COMPOSTER
LS10	EARTHEN LAGOON
LS11	RECEPTION SUMP LIFT STATION (6'ø)
LS12	RECEPTION SUMP LIFT STATION (7'ø)
LS13	OFFICE
LS14	RECYCLE LIFT STATION (6'ø)

LITTLE WABASH

EXISTING FACILITY DETAILS

ITEM	FACILITY DESCRIPTION
LW1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LW5	EXISTING SWINE BUILDING W/2' SHALLOW PIT
LW6	OFFICE
LW7	GENERATOR BUILDING
LW8	EARTHEN LAGOON (CELL A)
LW9	EARTHEN LAGOON (CELL B)
LW10	RECEPTION SUMP LIFT STATION (6'ø)
LW11	RECYCLE LIFT STATION (6'ø)

LAKEVIEW

EXISTING FACILITY DETAILS

ITEM	FACILITY DESCRIPTION
LV1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
LV5	EARTHEN LAGOON (CELL A)
LV6	EARTHEN LAGOON (CELL B)
LV7	RECEPTION SUMP LIFT STATION (6'ø)
LV8	RECYCLE LIFT STATION (6'ø)
LV9	OFFICE
LV10	BOAR ISOLATION W/ 9" SHALLOW PIT
LV11	DEPOT – LOAD/UNLOAD
LV12	OFFICE

SCALE VALID ONLY ON
22"x34" SIZE PLANS

MURPHY-BROWN, LLC. NMP
PREPARED WITH ASSISTANCE
FROM USDA-NRCS
ASSISTED BY: DANIEL N. FEUCHT
WAYNE COUNTY SOIL & WATER
CONSERVATION DISTRICT
WAYNE COUNTY, ILLINOIS

MAURER-STUTZ
ENGINEERS SURVEYORS

SHEET TITLE: SITE PLAN

PROJECT: MT. ERIE SOW FARM

CLIENT: MURPHY-BROWN, LLC.

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C102A

MT. ERIE

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
ME1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME4	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ME5	EARTHEN LAGOON
ME6	SWINE BUILDING

ELM RIVER

EXISTING FACILITY DETAILS	
ITEM	FACILITY DESCRIPTION
ER1	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ER2	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ER3	EXISTING SWINE BUILDING W/2'SHALLOW PIT
ER5	EARTHEN LAGOON
ER6	TRUCK WASH BUILDING
ER4	OFFICE

LEGEND

- SAN — GRAVITY MANURE TRANSFER PIPE
- FM — PRESSURE MANURE TRANSFER PIPE
- (AE) — AERIAL ELECTRIC LINE
- (W) — WATER LINE

N

0 100' 200'

BAR SCALE IN FEET

SCALE VALID ONLY ON 22"x34" SIZE PLANS

MURPHY-BROWN, LLC. NMP
PREPARED WITH ASSISTANCE FROM USDA-NRCS
ASSISTED BY: DANIEL N. FEUCHT
WAYNE COUNTY SOIL & WATER CONSERVATION DISTRICT
WAYNE COUNTY, ILLINOIS

MAURER-STUTZ
ENGINEERS SURVEYORS

SHEET TITLE: SITE PLAN

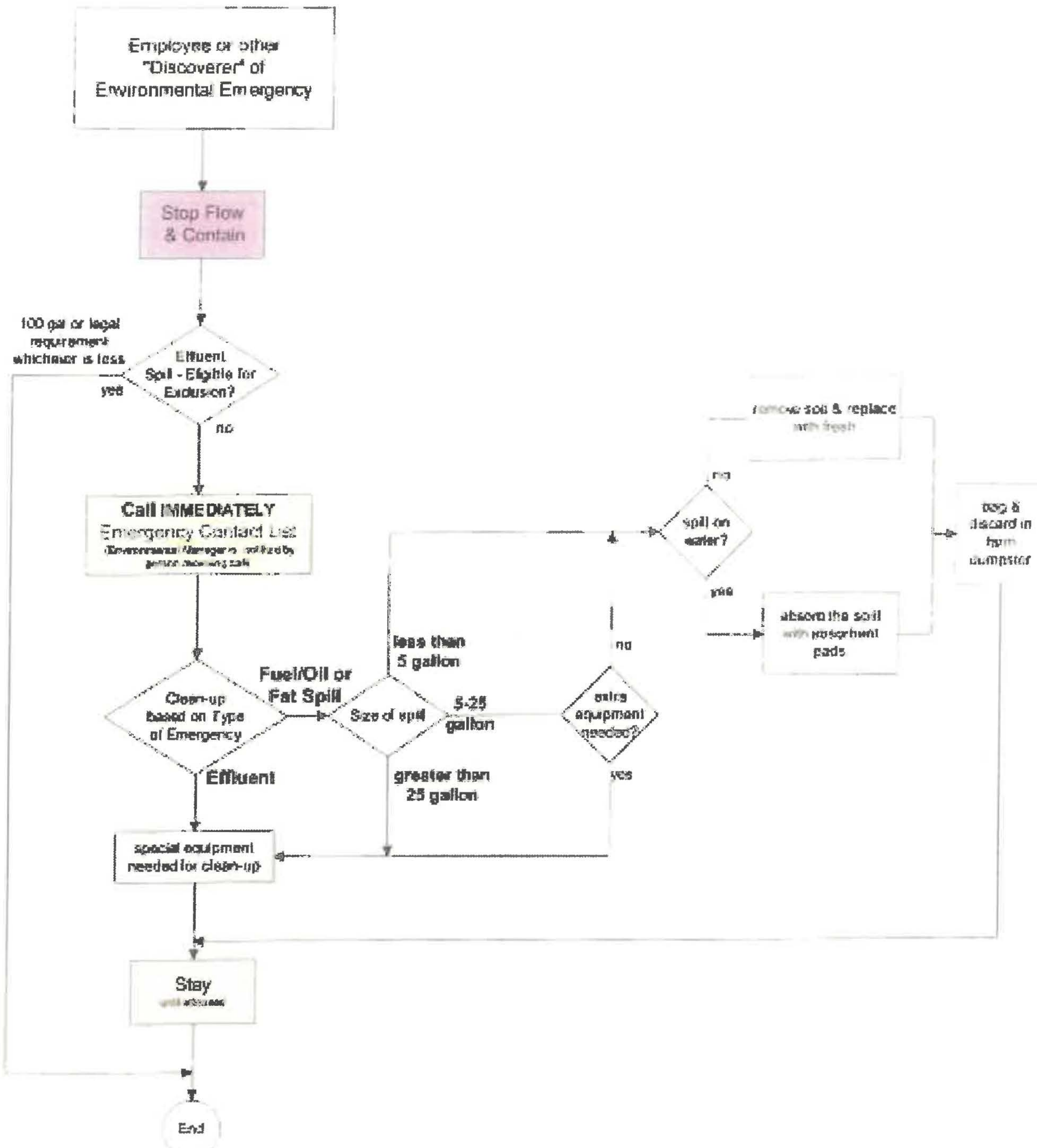
PROJECT: MT. ERIE SOW FARM

CLIENT: MURPHY-BROWN, LLC.

DESIGNED BY: DNF
REVIEWED BY: TLF
DATE: 2021
PROJECT NO.: 23804009.11
SHEET: C102B

Section 3. Farm Safety and Security

Murphy-Brown LLC
WESTERN OPERATIONS
Environmental Emergency Action Diagram



Murphy-Brown LLC

WESTERN OPERATIONS

EMERGENCY PROCEDURES and CONTACT LIST

ADDITIONAL EMERGENCY INSTRUCTIONS: *State Version 06-03-08*

EMERGENCY PROCEDURE

In the event of an emergency, immediate action should be taken as outlined in the appropriate area below.

EMERGENCY PROCEDURES

Animal Welfare

In the event of an emergency that may impact the well-being of the animals, immediate action should be taken. Immediately after discovery (as soon as practical) of any animal welfare event, contact the appropriate people following the telephone outline to the right.

Events which should be considered as an emergency that may impact the well-being of the animals are:

1. Power outage and emergency generator failure.
2. Water outage.
3. Feed outage.
4. Suspected disease outbreak.
5. Any single incident resulting in a loss of 10% of total farm capacity.
6. Animal Abuse

Environmental (Company owned/managed only)

If an incident occurs that results in the release of wastewater, fuel, oil, fat, or other hazardous material to soil or water outside of containment structures take the following steps immediately:

1. **Stop** the source of the spill, if possible and safe.
2. **Call** the appropriate contact(s) as indicated on the Emergency Procedures and Contact List.
3. **Stay** with the incident and work to contain the spill until help arrives and you are released.

In all cases, the spill must be cleaned up and contaminated material disposed of properly. A fuel/oil spill greater than 25 gallons or within 100 feet of a river, swamp, or ditch, is reportable to the EPA/NRCS by the Environmental Manager or their designee. A fat spill at the feed mill is reportable by the Environmental Manager or their designee as defined in the SPCC plan. Contract growers are responsible for reporting significant (as defined by law) spills of effluent to the proper regulatory agencies. The Environmental Manager or their designee is responsible for reporting significant (as defined by law) spills of effluent.
If there is any doubt, report the incident.

Safety (Company owned/managed only)

1. The Farm/Department Manager should call 911, then notify the main office and the Safety Manager as soon as possible.
2. When calling 911, stay on the phone until the operator has all the necessary information including:
   a. Directions to the farm/department
   b. Type of emergency
3. When the emergency puts the entire site at risk and since there are no alarms on the farms, notification of all personnel will have to be done by locating all employees and informing them of the type of emergency situation.
4. All employees on the farm should be aware of where the emergency shut off are for gas, water, and electricity.
5. Once the alarm has been given all employees should proceed to the designated assembly point.
6. After arrival at the assembly point, the Farm/Department Manager would account for all employees.

If anyone is unaccounted for, the last known location of the employee(s) should be ascertained and relayed to the emergency personnel as soon as they arrive on the scene.

Smithfield

Good food. Responsibly.®

Hog Production Missouri

Emergency Contact List

Johnson Controls - 660-748-7209

EHS Fax: 660-748-7186 (Safety & Environmental)

EHS email: EHSDepartment@smithfield.com (Safety & Environmental)

Safety Contacts

Kelli Young, RN
Safety Manager - MO/ILL Nurse
Office: 660-748-7223
Cell: 660-425-0654
Fax: 660-748-7331

Amie Curtis
Safety Coordinator
Office: 660-748-7222
Cell: 660-748-5693

Security Contact

Lori Young
HR Manager/Site Security
Office: 660-748-7224
Cell: 660-868-0836

Environmental Contacts

Blake Boxley
EHS Director
Office: 660-748-7239
Cell: 660-748-5370

Nacaela Berndt
Environmental Resource Spec.
Office: 660-748-7191
Cell: 816-341-6940

Kelly Fitch (Illinois)
Sr. Swine Production Manager
Office: 618-516-1484
Cell: 618-854-2347

Animal Care

Dr. Emily Fry
Veterinarian
Cell: 419-733-9387

Biosecurity Contact

Kiera Pollard
Biosecurity Manager
Office: 660-365-0226
Cell: 660-365-0226

SAFETY EMERGENCIES

If you have an injury that is life threatening, call 911. For all other injuries, follow the Accident Reporting Guidelines in your MSI Binder and on the MSI Bulletin Board (orange sheet).

SDS (Chemical Information) SEARCH

If you do not have Access to the SDS Finder on a computer, or the power is out, contact Johnson Controls for critical chemical information.

Smithfield Hotline #: 1-877-510-4979

Version: 04232024

Emergency Response Plan:

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.

CONTACT LIST

Immediately after discovery, contact the appropriate personnel in the contact list below. Contract growers are responsible for reporting significant (as defined by law) spills of effluent to the proper regulatory agencies. ENVIRONMENTAL: If first contact is not available, continue calling until someone is notified. If you reach the bottom of the list without speaking to a contact, start at the top.

EMERGENCY CONTACT:

NAME	*TITLE*	*OFFICE*	*MOBILE/CELL*	*HOME*
	Animal Well-Being			
Effingham Equity	Feed Mill	888-675-2683		
Sloans Water Well Drilling a	Water - Well Name	618-395-7147		
Wayne White Electric Coop	Power Company	618-842-2196		
Troyer Electric	Electrician	618-842-7169		
Herb Paul	Production Co Rep.	618-854-2355	618-925-2389	
Herb Paul	Head of Maintenance		618-925-2389	

Additional Emergency Numbers

	DNR Office	217-782-3637	217 -782-3637	
IL Emergency Management Agency	IEMA	800-782-7860		
IL Department of Agriculture	IDOA	217-785-2427		
Neil Borgic	Manure Applicator		618-553-5666	
Gill Excavating	Dirt Contractor	618-854-2488		
Effingham Equity	LP	888-675-2683		
Terry L. Feldmann	Engineer	309-693-7615	309-251-6962	

Emergency Response Personnel

Facility	Facility Mangers	CLM	Office Phone	Cell Phone
4088	Danny Myers – Mt. Erie Sow	LM11086		
4089	Ivy Fitch – Lakeview			
4090	Miranda Hoffee – Elm River			
4091	Gregorio Estrada – Little Wabash		618-854-2552	
4092	Osmin Calix – Lakside		618-854-2552	

Recovery equipment

Equipment	Location
Tractor	Owned - Lakeview
Fire Department	Mt Erie FPD

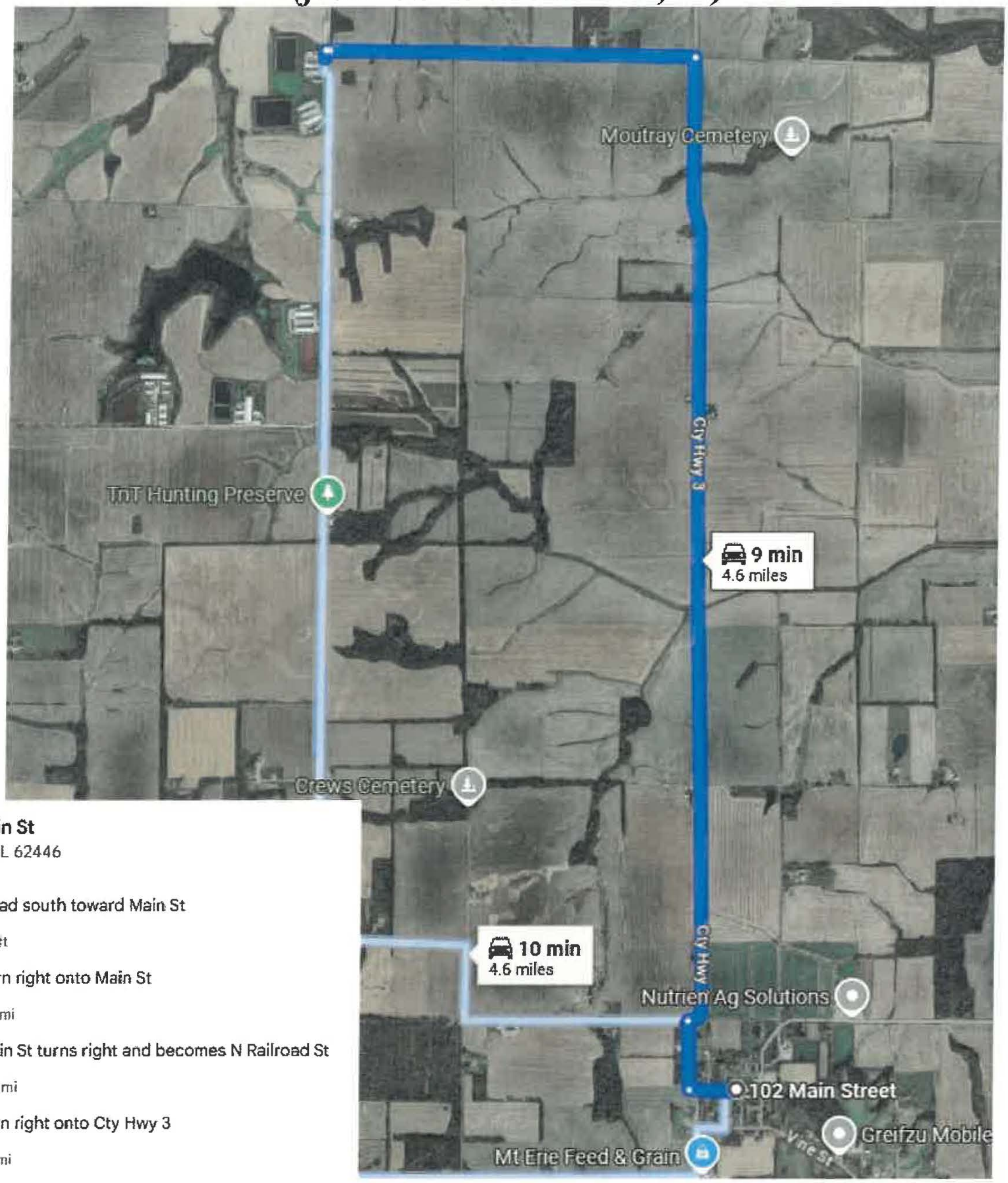
Be prepared to provide the following information:

a. Your name and contact information.
b. Farm location (driving directions) and other pertinent information.

See next page;

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.

Driving Directions to the Facility
(from USPS in Mt. Erie, IL)



102 Main St
Mt Erie, IL 62446

↑ Head south toward Main St
43 ft

↱ Turn right onto Main St
0.1 mi

↱ Main St turns right and becomes N Railroad St
0.2 mi

↱ Turn right onto Cty Hwy 3
3.1 mi

↰ Turn left onto Co Rd 2150N/County Rd 2150
1.2 mi

↑ Continue straight
66 ft

↰ Turn left
Destination will be on the right
125 ft

Mt Erie Sow
2059 County Rd 2400 E, Mt Erie, IL 62446

Emergency Action Plan

Emergency Storage Plan

In the event of cropping practices, soil conditions, weather conditions or other conditions prevent the application of livestock waste to land or prevent other methods of livestock waste disposal, a description of the storage provisions and schedules will be provided to comply with Section 502.320 of Title 35, Subtitle E, Chapter I.

Liquid Manure	*Manure may be transferred to neighboring storage facilities if available*

Spill Emergency Action Plan

Spills From Containment Breaches or Structure Failures

1. Construct earthen dike to contain or divert spill away from tiles, watercourses, roadways, and water of the state.
2. Relieve containment of manure sufficient to cease the unplanned release of manure.
3. Setup equipment and procedures to secure the containment from further uncontrolled releases until proper repairs are made.
4. Remove spill from diked area with vacuum tank.

Spills During Pumping Operations

1. Shut off all pumping equipment
2. Build a sand bag dike to contain or divert spills away from tiles, watercourses, and roadways
3. Use absorbent pads to stop leaks in dike
4. Remove spill from diked area with vacuum tank
5. If larger dike is necessary use backhoe to reinforce with soil barrier.

Spills During Transportation on Public Roadways

1. Coordinate efforts with local law enforcement and emergency personnel.
2. Contain spill or divert manure away from watercourses and roadways.
3. Wash manure from roadways and public use areas into the containment or diversion structure.
4. Remove spill from diked area with vacuum tank.

Clean-up Spill Area

1. Break down dike
2. Dry out sand bags
3. Discard any absorbent pads used
4. Level any soil disturbance and incorporate residue
5. Replace any discarded or damaged equipment

Spill Reporting

Part 580 of 35 IAC contains rules for the procedure that owners or operators of livestock waste handling facilitys must follow to satisfy their obligation under Section 18(a) of the LMFA [510 ILCS 77/18(a)]. If there is a release of more than 25 gallons or if waste ***HAS ENTERED*** surface or ground water, notify the Illinois Emergency Management Agency within 24 hours by calling **800-782-7860 or 217-782-7860.**

An owner or operator of a livestock waste handling facility shall report any release of livestock waste from the livestock waste handling facility or from the transport of livestock waste by means of transportation equipment within 24 hours after the discovery of the release. Reports of releases to surface waters, including to sinkholes, drain inlets, broken subsurface drains or other conduits to groundwater or surface waters, shall be made upon discovery of the release, except when such immediate notification will impede the owner's or operator's response to correct the cause of the release or to contain the livestock waste, in which case the report shall be made as soon as possible but no later than 24 hours after discovery. The report required under subsection (a) shall be given to the Illinois Environmental Protection Agency through the Illinois Emergency Management Agency.

Also, notify the following persons ASAP.

Name	Office	Cell Phone
Herb Paul	618-854-2355	618-925-2389
Terry L. Feldmann	309-693-7615	309-251-6962
Gayle C. Baker, PE	309-693-7615	563-380-8720

Written Reports

All spills must be reported to management personnel and include the following information.

1) name and telephone number of the person reporting the release;
2) county, distance and direction from nearest town, village or municipality of the release;
3) an estimate of the quantity in gallons that was released, and an estimate of the flow rate if the release is ongoing;
4) area into which the release occurred (field, ditch, stream, or other description) and apparent environmental impacts of the release;
5) time and duration of the release;
6) the names and telephone numbers of persons who may be contacted for further information;
7) dangers to health or the environment resulting from the release;
8) actions taken to respond to, contain and mitigate the release; and
9) name of facility and mailing address.

Follow up Written Report

An owner or operator of a livestock waste handling facility who reports by telephone any release of livestock waste shall provide a follow-up written report of the release within 5 days after the discovery of the release. The report shall confirm and update the information provided by telephone pursuant to Section 580.106. Written reports shall be addressed to:

Illinois Environmental Protection Agency
Bureau of Water
Compliance Assurance Section
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Custom Applicator Agreement

> *"I have received and agree to follow this emergency spill recovery plan and reporting protocol. I will land apply the manure from this facility using Best Management Practices. I agree to monitor all application equipment and prevent runoff due to the application process. In the event of a spill I will follow the procedures outlined by this plan."*

Custom Applicator______________________________ Date_______________

Owner/Operator__________________________________ Date_______________

3.2. Biosecurity Measures

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

3.3. Catastrophic Mortality Management

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

Plan for Catastrophic Animal Mortality Handling

The following table describes how you plan to manage catastrophic loss of animals in a manner that protects surface and ground water quality. You must follow all national, state and local laws, regulations and guidelines that protect soil, water, air, plants, animals and human health.

Steps for Managing Catastrophic Mortality
Step 1: Prior to carcass disposal, contact the Illinois Department of Agriculture – Bureau of Animal Health & Welfare / Illinois State Veterinarian and / or your engineer at Maurer-Stutz, Inc. **Illinois State Veterinarian: 217-782-4944** **Maurer-Stutz, Inc.: 309-693-7615 (office)** **309-251-6962 (Terry Feldmann cellular)** **Step 2: At the discretion and direction of the Illinois State Veterinarian and / or your engineer, begin disposing of catastrophic mortality by methods in accordance with applicable laws and regulations (i.e. via licensed rendering service, burial, composter, or large scale temporary composter (if needed)).**

Medical Waste Disposal

Medical waste is stored in a container labeled "Sharps" and disposed of properly.

3.4. Chemical Handling

If checked, the indicated measures will be taken to prevent chemicals and other contaminants from contaminating process waste water or storm water storage and treatment systems.

	This is not a regulatory-agency permitted facility. This section does not apply.

	Measure
x	All chemicals are stored in proper containers. Expired chemicals and empty containers are properly disposed of in accordance with state and federal regulations. Pesticides and associated refuse are disposed of in accordance with the FIFRA label.
x	Chemical storage areas are self-contained with no drains or other pathways that will allow spilled chemicals to exit the storage area.
x	Chemical storage areas are covered to prevent chemical contact with rain or snow.
x	Emergency procedures and equipment are in place to contain and clean up chemical spills.
x	Chemical handling and equipment wash areas are designed and constructed to prevent contamination of surface waters and waste water and storm water storage and treatment systems.
x	All chemicals are custom applied and no chemicals are stored at the operation. Equipment wash areas are designed and constructed to prevent contamination of surface waters and waste water and storm water storage and treatment systems.

Section 4. LAND TREATMENT

4.1. Map(s) of Fields and Conservation Practices

a-b: See Appendix A.
c-d: See attached RUSLE2 reports at end of this section – N/A.
e-i: See Appendix A.

4.2. Land Treatment Conservation Practice

Resource Concerns (Water Quality, Soil Erosion, etc)
The following water quality issues have been address by this section of the Comprehensive Nutrient Management Plan.

a: Sheet and Rill Erosion

a-1: See Section 4.3 – N/A

a-2: See Section 4.3 – N/A

a-3: Proposed Practices Summary
The following pages list proposed practices, and operation and maintenance procedures that should be adhered to for this facility.

a-5: Operation and maintenance:
No operation and maintenance requirements have been identified for this practice.

b: Ephemeral and Gully Erosion

b-1: No practices are proposed at this time for the operation.

b-2: Proposed Practices Summary
No practices are proposed at this time for the operation.

b-4: Operation and maintenance: No operation and maintenance requirements have been identified for this practice.

c: Water Quality Considerations

c-1: Proposed Practices Summary
No practices are proposed at this time for the operation.

c-3: Operation and maintenance

d: Air Quality Considerations

4.3. RUSLE2 Soil Loss Calculations Land Treatment Conservation Practices

N/A

Section 5. SOIL and RISK ASSESSMENT

5.1. Soil Information – N/A

5.2. Predicted Soil Erosion – N/A

5.3. Nitrogen and Phosphorus Risk Analysis – N/A

Illinois Nitrogen Risk Assessment Procedure

Nitrate loss potentials based on soil texture, timing, and nitrification inhibitors

FIELDS:	None	All Fields	None
Application Timing[1]	Soil Texture[2]		
	Coarse	Medium	Fine
Fall with an inhibitor > 60° F	High	High	High
Fall with an inhibitor < 60° F	High	Medium	Medium
Fall without an inhibitor > 50° F	High	High	High
Fall without an inhibitor < 50° F	High	Medium	Medium
Spring without an inhibitor	Medium	Medium	Medium-Low
Spring with an inhibitor	Medium-Low	Low	Low
Spring split applied or sidedress	Medium-Low	Low	Low

Foot notes:

1. Temperatures refer to soil temperature measured at a depth of 4 inches. For this assessment, inhibitors refer to nitrification inhibitors.
2. Soil Texture: Coarse - sand, loamy sand, sandy loam
   Medium - silt, silt loam, loam
   Fine - silty clay loam, silty clay, clay, clay loam, sandy clay, loam, sandy clay

NITROGEN RISK SUMMARY

All of the fields behave essentially the same under the following management regarding nitrogen conservation:

- High risk of nitrogen losses if fall applied without use of an inhibitor until temperatures are below 50 degrees at a depth of 4".
- Medium risk of nitrogen loss if fall applied with a nitrification inhibiter added.
- Medium to Low risk if spring applied without an inhibiter.

- Low risk if spring applied with a nitrification inhibitor added.
- Low risk if split applied or sidedress.

Recommended Management Practices to Reduce Nitrogen Losses:

1. Set realistic yield goals and follow University of Illinois' nitrogen recommendations.
2. Take credit for nitrogen from **all** sources: previous legume crop, incidental nitrogen contained in diammonium phosphate (DAP) and other fertilizers, manure applications, etc.
3. Determine nitrate loss potential using the table above. Use this as a guideline to determine application timing for fields with various soil textures. (More detailed information on total nitrogen loss potential is available in the University of Illinois Agricultural Experiment Station Bulletin 784, Nitrogen-Loss Potential Ratings for Illinois Soils.)
4. In fields where spring applications are not usually troublesome, apply the majority of the nitrogen shortly before or after planting.
5. For fall applications, use a nitrification inhibitor or wait until the soil has cooled down to 50° F. Even when applying a nitrification inhibitor, do not apply nitrogen until soil has cooled to 60° F. Probable dates when these soil temperatures are expected are contained in the *Illinois Agronomy Handbook.* In most cases, fall nitrogen and manure applications should not begin prior to the third week in October.
6. Use adequate levels of phosphorus, potassium, and other nutrients to ensure optimum yields and nitrogen use efficiency.
7. Conduct a post-harvest evaluation of the nitrogen program:
   - Compare actual yields vs. yield goal;
   - Evaluate factors affecting yields and nitrogen use efficiency;
   - Consider using plant tissue analyses and an end-of-season corn stalk nitrate test to evaluate plant nitrogen sufficiency;
   - Refine nitrogen rates for future years.
8. Review each nutrient management plan annually to determine if changes in the nutrient budget are needed.
9. Calibrate application equipment annually, at minimum, to ensure uniform distribution of material at planned rates.
10. Use filter strips and riparian forest buffers to intercept nutrients transported surface runoff to the stream. (Note: these practices will have minimal effect in areas with extensive subsurface drainage.)
11. Avoid applying nitrogen around environmentally sensitive areas such as sinkholes, wells, gullies, ditches, surface inlets, or rapidly permeable areas.
12. Use cover crops, such as rye, to capture residual nitrogen after harvest and prevent nitrogen from being lost between harvest and planting of the next crop.
13. Utilize water table management to reduce artificial drainage when it is not needed for crop growth or field operations.
14. Utilize water table management to reduce artificial drainage when it is not needed for crop growth or field operations.
15. Outlet tiles into constructed wetlands to remove a portion of the nitrogen before tile effluent discharges into lakes or streams.

Illinois Phosphorus Risk Assessment Procedure

Phosphorus (P) loading to surface water can accelerate Eutrophication. The availability of other nutrients and light penetration into the water column will also influence the response of water bodies to phosphorus. Factors such as: the amount of erosion and runoff; the form, amount, and distribution of phosphorus in the soil: and fertilizer and manure application rate, timing and placement determine P loss from agricultural fields and the resulting P loading to water resources. Most phosphorus compounds found in soils have low water solubility. Consequently, P loss from agricultural land was once thought to be primarily associated with soil erosion. In many cases, sediment-bound P is still the dominant form in which P losses from agricultural fields occur. Over the past decade, research has shown that phosphorus can be lost in runoff in dissolved forms. High dissolved P concentration in runoff is more frequently observed where soil P levels are high particularly near the soil surface. High soil P levels, however, do not automatically equate to high dissolved P in runoff. As stated earlier, numerous factors interact to create the potential for P losses from agricultural fields. Many of the basic processes that govern P transport are known. It is difficult, however, to know at any given site which factor(s) influence P loss rates proportionally more than others. Insufficient data exist in Illinois to definitively guide landowners as to which factors in a specific field contribute the most to P losses. There are indications, however, that where solution P losses from crop fields are dominant, high soil P concentration at the surface are likely the most dominant factor.

The purpose of this guide is to (1) help land managers identify factors in agricultural fields known to contribute "P" runoff loss and, (2) identify practices that can reduce phosphorus loss from agricultural fields. The factors most commonly associated with both dissolved and sediment bound P loss are presented. For each factor, guidance is provided to help land managers estimate the relative potential for P transport to surface water. It is important to realize that the procedure is not a predictive tool for P loading. It is merely a tool for assessing the relative potential for phosphorus transport.

Use of P- Risk Assessment:

When possible, land managers should adopt management practices that minimize phosphorus loss risk factors. If phosphorus containing materials need to be applied to fields that have medium or high risk potentials, recommended management practices should be used to reduce the risk of phosphorus transport.

Examples of Practices to Reduce Phosphorus Risk Potential Soil Erosion Control:

- Use residue management and/or structural practices to reduce sheet and rill erosion.
- Install filter strips, riparian forest buffers, contour buffer strips, field borders, or wetlands

Minimize Connectivity to Water Bodies:

- Install water and sediment control basins to reduce quantity of sediment transported offsite
- Install conservation buffers adjacent to water resources to create nutrient application setbacks.

Reduce Runoff Potential:

- Terrace fields to reduce slope length.
- Contour strip cropping, contour buffer strips, cover crops, crop rotations that include meadow and/or small grains, and crop residue management.

Lower Soil Test Phosphorus:

- Sample soils on high testing fields to determine vertical distribution of the phosphorus.
- If phosphorus is concentrated in the top two inches of soil, invert the soil (e.g. moldboard plow) where soil erosion will not be a problem.
- Avoid stratification by placing phosphorus materials beneath the top two inches of the soil surface.

Practice Nutrient Management:

- Apply no more than maintenance levels of phosphorus when soil test P reaches the levels described in the Illinois Agronomy Handbook, Chapter 11.

Phosphorous Risk Assessment - Site Characteristic Definitions:

1. SOIL EROSION – Sheet and rill erosion as measured by the most current version of the Revised Universal Soil Loss Equation (RUSLE).
2. CONNECTIVITY TO WATER – Defines the potential for P to be transferred from the site to a perennial stream or water body. The more closely connected the runoff is from the field via concentrated flow (from a defined grassed waterway or surface drain) to a perennial stream or water body the higher the potential for of P transport.
3. RUNOFF CLASS – Represents the effect of the Hydrologic Soil Group (A, B, C, D) on runoff. This factor represents the site's runoff vulnerability.
4. SOIL "P" TEST (BRAY P1 or Mehlich 3) – The soil test procedure using the Bray P1 extraction, or other extraction test calibrated to Bray P1, that provides an index of plant available P expressed in lbs. P/ac (PPM X 2 = lbs./ac where soil samples are obtained to the 6 2/3" depth).
5. "P INPUTS" - Represents the combined effect of application method and application rate on the potential for phosphorus to be transported in runoff in both dissolved and sediment-bound phases. Phosphorus application rate is expressed in terms of the University of Illinois maintenance phosphorus recommendations applicable to crops/yields grown on the site being evaluated. See the "P Inputs Matrix" below. Phosphorus may be in the form of commercial fertilizer or organic materials such as manure, animal waste lagoon supernatant, wastewater from municipal or agricultural sources or nonagricultural biosolids such as sewage sludge or landscape waste. When using the "P Input Matrix, it is assumed that soil incorporation is performed prior to runoff events. Instances where incorporation is typically not performed prior to runoff events will be considered as non-incorporated surface applications.

P INPUT MATRIX

	Application Rate		
Application Method	**<= UI Recommendations**	**>UI – 150% UI**	**>150% UI**
Incorporation or Injection > 3" below surface	Low	Low	Low
Shallowly incorporated surface applications <3 inches	Low	Medium	High

Non-incorporated surface applications	Medium	High	High

Recommended Management Practices to Reduce Phosphorus Losses

1. Perform soil test regularly (minimum of every four years) and follow University of Illinois' recommendations for application rates.
2. Do not maintain excessively high phosphorus soil test levels, especially in areas prone to phosphorus transport.
3. Use variable rate applications to increase the precision of phosphorus applications and to maintain rates needed for optimal crop production.
4. In areas where phosphorus losses occur primarily from surface runoff, incorporate or inject phosphorus beneath the soil surface.
5. Control soil erosion to 'T' or less.
6. Utilize agronomic practices that optimize crop production to maximize phosphorus utilization.
7. Use filter strips or riparian forest buffers to reduce offsite transport of particulate phosphorus.
8. Avoid applying nutrients when soils are frozen or covered with ice or snow.
9. Fall applications of phosphorus that are not incorporated into the soil should not be applied on slopes greater than 5% unless runoff control measures such as heavy residue cover, contour mulch tillage, contour strip cropping, or terraces have been applied.
10. Minimize surface runoff of water by reducing compaction, maintaining high crop residue levels, installing runoff control structures such as terraces, etc.
11. Avoid stratification on soils that are susceptible to runoff and erosion.

Field Specific Phosphorus Risk Factors

The table below identifies specific risk factors that may present in a given field. No attempt should be made to "average" the factors and assign a composite rating for the field. It is recognized that the risk factors do not act independently to influence phosphorus loss from agricultural fields and P loading into water resources. Simple averaging however, assumes that all risk factors have the same amount of influence. Attempts to objectively weight some factors more or less than others would be desirable but difficult without supporting data. The phosphorus assessment procedure is not a process based or empirical model. The procedure was developed as a conservation planning tool. The tool is designed to provide guidance to select and plan conservation measures that will lower the potential for phosphorus loss from agricultural fields and P loading into water resources.

Section 6. NUTRIENT MANAGEMENT

Manure Application Plan

Basis of Nutrient Management

The Murphy Brown Nutrient Management plan Manure application rates are based upon crop nitrogen needs. Nitrogen rates for crops in the plan are based on The Illinois CAFO Rules, i.e. Title 35: Subtitle E: Chapter I: Part 502, Section 560, Appendix A, Agronomic Fertilization Rates for Various Illinois Crops. Crop yields by the landowners to Murphy Brown, LLC.

Notes and Assumptions:

- **Avail. N*** is the estimated amount of plant available nitrogen remaining after losses due to application method and timing.
- For liquid manure applications, see attached spreadsheets in this section
- When liquid manure is applied to fields with tile, drainage tile plugs (or similar devices) shall be available on-site to plug tile outlets should manure begin to flow from the tile outlets.

Estimated Manure Nutrient Analysis

(See attached Maurer-Stutz, Inc. Nutrient Management Calculations - this section)

Manure tests were provided by the producer for existing storages. See Appendix C.

Manure and Commercial Fertilizer Application Plan

(See attached Maurer-Stutz, Inc. Nutrient Management Calculations – this section)

6.1. Field Information

(See attached Maurer-Stutz, Inc. Nutrient Management Calculations)

6.2. Manure Application Setback Distances

Setback Requirements:

Feature	Setback Criteria	Setback Distance (Feet)
Wells	All applications	150
Sinkholes	All applications	200
Surface waters	All applications	200

Source: Livestock Management Facilities Act (LMFA)

6.3. Soil Test Data

Soil testing frequency, timing, and content are included Appendix B.

6.4. Manure Nutrient Analysis

Manure testing frequency, timing, and content, including the following requirements are included in Appendix C.

1. Manure tests for liquid manure shall be taken before each major spreading time from each type of storage, until average nutrient values can be determined.
2. Manure tests for solid manure shall be taken before each major spreading time such as spring and fall, until average nutrient values can be determined.
3. Manure tests will include Total N, ammonium N, P_2O_5, and K_2O.
4. Information on procedures for manure sampling, storage and shipping see Appendix C.

6.5. Planned Crops and Fertilizer Recommendations

(See attached Maurer-Stutz, Inc. Nutrient Management Calculations)

6.6. Calculating Manure Application Rates

(See attached Maurer-Stutz, Inc. Nutrient Management Calculations)

6.7.A Projected Manure Nutrient Applications

(See attached Maurer-Stutz, Inc. Nutrient Management Calculations)

6.7.B Projected Commercial Nutrient Applications

N/A – Manure is exported to 3rd parties. Commercial fertilizer application decisions are made by the cropland owner/operator. Murphy-Brown does not have control over commercial fertilizer applications to cropland in this nutrient management plan.

6.8.A Projected Annual Nutrient Balance of Spreadable Acres

(See attached Maurer-Stutz, Inc. Nutrient Management Calculations)

6.8.B P & K Balance

(See attached Maurer-Stutz, Inc. Nutrient Management Calculations)

6.9. Projected Manure Inventory

(See attached Maurer-Stutz, Inc. Nutrient Management Calculations)

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - NMP
PROJECT NO.: 23804009.01
COMPUTATION BY: DNF DATE: 5/1/25 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: Crop Record

	Crop Grown									
FIELD NAME	2014	2015	2016	2017	2019	2020	2021	2022	2023	2024
Bailey 1					SB	SB	C	C	W	C
Bailey 2					SB	SB	C	W	C	SB
Bailey 3					SB	SB	C	W	C	C
Bailey 4					SB	SB	C	W	C	SB
Bailey 5					SB	SB	C	W	C	C
Bailey 6					SB	SB	C	C	W	C
Bailey 7					SB	SB	C	C	W	C
Bailey 8					SB	SB	C	C	W	C
Bailey 9					SB	SB	C	C	W	C
Bailey 10					SB	SB	C	W	C	C
Bailey 11					SB	SB	C	W	C	C
Bailey 12					SB	SB	C	W	C	C
Bailey 21					SB	SB	C	SB	C	SB
Bailey 22					SB	SB	C	W	C	SB
Bailey 22A					SB	SB	C	W	C	SB
Shan 24					C	SB	C	SB	C	SB
Shan 25					SB	C	SB	SB	C	SB
Shan 27					C	SB	C	SB	C	SB
Shan 28					SB	C	SB	SB	C	SB
Shan 29					C	SB	C	SB	C	SB
Shan 30					SB	C	SB	SB	C	SB
Shan 31E					SB	C	SB	C	SB	C
Shan 31W					SB	C	SB	C	SB	C
Shan 32					C	SB	C	SB	C	SB
Shan 33					SB	C	SB	C	SB	C
Shan 34					SB	C	SB	C	SB	C
Eckel 16					SB	C	SB	C	SB	C
Eckel 17					SB	C	SB	C	SB	C
Eckel 18					SB	C	SB	C	SB	C
Eckel 19					SB	C	SB	C	SB	C
Eckel 20					SB	C	SB	C	SB	C
H37					SB	SB	C	C	W	C
H36					C	SB	C	SB	SB	C
H38					SB	C	SB	C	SB	C
Eckel 38					SB	C	SB	C	SB	C
Eckel 35					SB	C	SB	C	SB	C
Eckel 38					SB	C	SB	C	SB	C
Shan 35					C	SB	C	SB	C	SB
Shan 36					PP	C	SB	C	SB	SB
Lynch 39					C	SB	C	SB	C	SB

Notes:

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - NMP
PROJECT NO.: 23804009.01
COMPUTATION BY: DNF DATE: 5/1/25 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: 5-Year Yield Avg. - Corn

	Corn, bu										5*	10**
FIELD NAME	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg	Avg
Bailey 1		144					200	183	183	200	192	182
Bailey 2			150				200		200		200	183
Bailey 3			150				200		200	200	200	188
Bailey 4				91.2			200		200		200	164
Bailey 5	125						200		200	200	200	181
Bailey 6		147		126			200	177		200	192	170
Bailey 7		147		126			200	177		200	192	170
Bailey 8		147		126			200	177		200	192	170
Bailey 9		147		126			200	177		200	192	170
Bailey 10			150				200		200	200	200	188
Bailey 11			150				200			200	200	183
Bailey 12			150				200			200	200	183
Bailey 21	125						200		200		200	175
Bailey 22							200		200		200	200
Bailey 22A			150				200		200		200	183
Shan 24			114		140		211				211	155
Shan 25			122								####	122
Shan 27			120		143		219				219	161
Shan 28	154					177					177	166
Shan 29			115		187		223				223	175
Shan 30			116			177					177	146
Shan 31E	123									175	175	149
Shan 31W	123									175	175	149
Shan 32			125		168		233				233	175
Shan 33	74									175	175	125
Shan 34										175	175	175
Eckel 16											####	####
Eckel 17						177	200				189	189
Eckel 18						177	200				189	189
Eckel 19											####	####
Eckel 20											####	####
H37					143		200	199		200	200	186
H36		144					200	183		200	194	182
H38						135		205		200	180	180
Eckel 38											####	####
Eckel 35					184	177	200				189	187
Eckel 38											####	####
Shan 35											####	####
Shan 36					184	177	194				186	185
Lynch 39					184				175		175	180
											####	####
	####	####	####	####	####	####	####	####	####	####	####	####
WT AVG.	131	145	141	121	114	125	219	185	199	195	185	161

* 5yr Yield Block

**10yr running average

Notes:

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - NMP
PROJECT NO.: 23804009.01
COMPUTATION BY: DNF DATE: 5/1/25 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: 5-Year Yield Avg. - Soybeans

	Soybeans, bu										5*	10**	* 5yr Yield Block
FIELD NAME	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg	Avg	**10yr running average
Bailey 1	25		50	49.7		43					43	42	
Bailey 2	25	54.8		67.2		43		38		55	45	47	
Bailey 3	25	56.8		57.1		43					43	45	
Bailey 4	25	53.5	50			43		38		55	45	44	
Bailey 5		31.7	50	38.4		43		38			41	40	
Bailey 6	25		50			43			44		44	41	
Bailey 7	25		50			43			44		44	41	
Bailey 8	25		50			43			44		44	41	
Bailey 9	25		50			43			44		44	41	
Bailey 10	25	56.7		60.7		43		38			41	45	
Bailey 11	25	55.3		64.1		43		38	38		40	44	
Bailey 12	25	55.3		64.1		43		38	38		40	44	
Bailey 21		42.6	50	51.3		43				55	49	48	
Bailey 22	25					43		38		55	45	40	
Bailey 22A		47.6		55.7		43					43	49	
Shan 24	41	55.5				43		54	60	58	54	52	
Shan 25	43	54.3			45.3	43	68	54	55	58	56	53	
Shan 27	40	54.8				43		54	60	58	54	52	
Shan 28		54.3	39.3		43		68	54	55	58	59	53	
Shan 29	41	45.6			40.1	43	52	54	55	58	52	49	
Shan 30	41	55.1			47.6		67	54	55	58	59	54	
Shan 31E		54.8	40.7				58		50		54	51	
Shan 31W		54.8	40.7				58		50		54	51	
Shan 32	40	65.7						54	55	58	56	55	
Shan 33		44.1					56		50		53	50	
Shan 34	34	33.5					36		50		43	38	
Eckel 16											####	####	
Eckel 17					50	50					50	50	
Eckel 18					50	50					50	50	
Eckel 19											####	####	
Eckel 20											####	####	
H37				49.7		43			44		44	46	
H36					51.7	43			66		55	54	
H38						44			70		57	57	
Eckel 38											####	####	
Eckel 35					50.8						####	51	
Eckel 38											####	####	
Shan 35								54	55	58	56	56	
Shan 36								45	50	58	51	51	
Lynch 39						43	45	55		58	50	50	
WT AVG.	37.1	55.6	45.6	55.1	50.4	46	51.5	40.8	52.7	45.2	47	49	

Notes:

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - NMP
PROJECT NO.: 23804009.01
COMPUTATION BY: DNF DATE: 5/1/25 SH. NO.: 1
CHECKED BY: DATE: OF: 1

Subject: 5-Year Yield Avg. - Wheat

	Wheat, bu										5*	10**
FIELD NAME	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg	Avg
Bailey 1											####	####
Bailey 2	40							75			75	58
Bailey 3	40										####	40
Bailey 4	40							75			75	58
Bailey 5								75			75	75
Bailey 6									90		90	90
Bailey 7									90		90	90
Bailey 8									90		90	90
Bailey 9									90		90	90
Bailey 10	40							75			75	58
Bailey 11								75	75		75	75
Bailey 12								75	75		75	75
Bailey 21											####	####
Bailey 22	40							75			75	58
Bailey 22A											####	####
Shan 24											####	####
Shan 25											####	####
Shan 27											####	####
Shan 28											####	####
Shan 29											####	####
Shan 30											####	####
Shan 31E											####	####
Shan 31W											####	####
Shan 32											####	####
Shan 33											####	####
Shan 34											####	####
Eckel 16											####	####
Eckel 17											####	####
Eckel 18											####	####
Eckel 19											####	####
Eckel 20											####	####
H37									90		90	90
H36											####	####
H38											####	####
Eckel 38											####	####
Eckel 35											####	####
Eckel 38											####	####
Shan 35											####	####
Shan 36											####	####
Lynch 39											####	####
WT AVG.	40							75	86.9		81	81

* 5yr Yield Block
**10yr running average

Notes:

MAURER-STUTZ

Manure Nutrient Management Plan

PROJECT: Murphy-Brown, LLC. - Mt. Erie Sow Farm

PROJECT NO.: 23804009.01

COMPUTATION BY: DNF DATE: 1/9/23

CHECKED BY: TLF DATE:

Plan Start Year: 2025

Plan End Year: 2030

PHOSPHOURUS SUPPLYING POWER

HIGH

CATION EXCHANGE CAPACITY

Table of Contents

Note to users and those reviewing this document:

All values in the shaded areas are inputs based on specific client information. Those values not in the shaded areas were calculated based on data from Mid West Plan Service - 18, NRCS Animal Waste Management Field Hand book part 651 Chapter 11, Illinois Agronomy Handbook, and/or Title 35 Subtitle E Chapter II Part 560 Appendix A.

v 19.2 by GCB

MAURER-STUTZ

PROJECT: Murphy-Brown, LLC. - Mt. Erie So
PROJECT NO.: 23804009.01

TABLE 6.1 - FIELD INFORMATION

COMMON MANAGEMENT UNIT #1: Hohlbaugh

FIELD NAME	TOTAL ACRES	SPREAD ACRES	SETBACK ACRES
B-1 (FHohlbaugh-T1-)	35.5	23	12.5
B-2 (FHohlbaugh-T2-)	20.3	19.1	1.2
B-3 (FHohlbaugh-T2-)	71.9	59.7	12.2
B-4 (FHohlbaugh-T2-)	23.1	22.7	0.4
B-5 (FHohlbaugh-T2-)	41	36	5
B-6 (FHohlbaugh-T1-)	68.4	64.2	4.2
B-7 (FHohlbaugh-T1-)	35	33	2
B-8 (FHohlbaugh-T1-)	47.8	46.5	1.3
B-9 (FHohlbaugh-T1-)	25.5	21.3	4.2
B-10 (FHohlbaugh-T1-)	33.1	32.5	0.6
B-11 (FHohlbaugh-T1-)	16.4	15.8	0.6
B-12 (FHohlbaugh-T1-)	41.7	39.2	2.5
B-21 (FHohlbaugh-T2-)	22.4	20.8	1.6
B-22A (FHohlbaugh-T2-)	17.2	16	1.2
H-36 (FHohlbaugh-T5-)	192.1	168.3	23.8
H-37 (FHohlbaugh-T6-)	51.4	45.9	5.5
H-38 (FHohlbaugh-T-)	68.9	61.8	7.1
TOTAL:	*811.7*	*725.8*	*85.9*

COMMON MANAGEMENT UNIT #2: Shan

FIELD NAME	TOTAL ACRES	SPREAD ACRES	SETBACK ACRES
S-24 (FShan-T3-)	106.1	99.5	6.6
S-25 (FShan-T3-)	76.9	72.9	4
S-27 (FShan-T3-)	118.8	104.8	14
S-28 (FShan-T3-)	113.2	110.7	2.5
S-29 (FShan-T3-)	74.5	73	1.5
S-30 (FShan-T3-)	37.3	37.2	0.1
S-31E (FShan-T3-)	54.2	44.2	10
S-31W (FShan-T3-)	62.5	56	6.5
S-32 (FShan-T3-)	59.8	59.7	0.1
S-33 (FShan-T3-)	36.4	25.5	10.9
S-34 (FShan-T3-)	71.9	54.2	17.7
S-35 (FShan-T-)	34	32.1	1.9
S-36 (FShan-T-)	111.8	91.5	20.3
TOTAL:	*957.4*	*861.3*	*96.1*

COMMON MANAGEMENT UNIT #3: Eckel

FIELD NAME	TOTAL ACRES	SPREAD ACRES	SETBACK ACRES
E-16 (FEckel-T4-)	20.5	20.5	0
E-17 (FEckel-T4-)	59.4	58.7	0.7
E-18 (FEckel-T4-)	39.3	39.3	0
E-19 (FEckel-T4-)	71.7	51.4	20.3
E-20 (FEckel-T4-)	115.5	93.6	21.9
E-35 (FEckel-T4-)	26.8	20.6	6.2
E-38 (FEckel-T4-)	204.6	183.2	21.4
TOTAL:	*537.8*	*467.3*	*70.5*

COMMON MANAGEMENT UNIT #4: Lynch

FIELD NAME	TOTAL ACRES	SPREAD ACRES	SETBACK ACRES
L-39 (FLynch-T-)	149.8	149.6	0.2
TOTAL:	*149.8*	*149.6*	*0.2*
TOTAL:	*2456.7*	*2204*	*252.7*

MAURER-STUTZ

TABLE 6.3 MEDIAN SOIL TESTS

PROJECT: Murphy-Brown, LLC. - Mt. Erie Sow Farm

	2018 SOIL TEST					2019 SOIL TEST					2020 SOIL TEST					2023 SOIL TEST				
	% OM	P*	K	PH	BM/AM	% OM	P*	K	PH	BM/AM	% OM	P*	K	PH	BM/AM	% OM	P*	K	PH	BM/AM
FIELD NAME	%	LB/AC	LB/AC			%	LB/AC	LB/AC			%	LB/AC	LB/AC			%	LB/AC	LB/AC		
B-1 (FHohlbaugh-T1-)						"	27	410	"											
B-2 (FHohlbaugh-T2-)						"	33	642	"											
B-3 (FHohlbaugh-T2-)						"	36	665	"											
B-4 (FHohlbaugh-T2-)						"	25	510	"											
B-5 (FHohlbaugh-T2-)						"	50	443	"											
B-6 (FHohlbaugh-T1-)						"	71	633	"											
B-7 (FHohlbaugh-T1-)						"	71	633	"											
B-8 (FHohlbaugh-T1-)						"	71	633	"											
B-9 (FHohlbaugh-T1-)						"	71	633	"											
B-10 (FHohlbaugh-T1-)						"	65	663	"											
B-11 (FHohlbaugh-T1-)						"	166	609	"											
B-12 (FHohlbaugh-T1-)						"	166	609	"											
B-21 (FHohlbaugh-T2-)						"	43	450	"											
B-22A (FHohlbaugh-T2-)						"	30	577	"											
S-24 (FShan-T3-)																"	49	568	"	
S-25 (FShan-T3-)																"	203	378	"	
S-27 (FShan-T3-)																"	32	254	"	
S-28 (FShan-T3-)																"	189	262	"	
S-29 (FShan-T3-)																"	32	257	"	
S-30 (FShan-T3-)																"	284	358	"	
S-31E (FShan-T3-)																"	31	152	"	
S-31W (FShan-T3-)																"	31	152	"	
S-32 (FShan-T3-)																"	44	311	"	
S-33 (FShan-T3-)																"	34	143	"	
S-34 (FShan-T3-)																"	74	117	"	
S-35 (FShan-T-)																"	23	209	"	
S-36 (FShan-T-)																"	61	152	"	
E-16 (FEckel-T4-)																				
E-17 (FEckel-T4-)																				
E-18 (FEckel-T4-)																				
E-19 (FEckel-T4-)																				
E-20 (FEckel-T4-)																				
E-35 (FEckel-T4-)																				
E-38 (FEckel-T4-)																				
H-36 (FHohlbaugh-T5-)																				
H-37 (FHohlbaugh-T6-)						"	27	410	"											
H-38 (FHohlbaugh-T-)											"	25	295	"						
L-39 (FLynch-T-)	"	48	226																	

** soil phosphorous test results above are the result of Bray P1 test*

MAURER-STUTZ

COMPUTATION BY: DNF DATE: 1/9/23
CHECKED BY: DATE:

Table 6.4 Manure Sources
Available Nutrients Calculations

PROJECT: Murphy-Brown, LLC. - Mt. Erie Sow Farm
PROJECT NO.: 23804009.01

LAND APPLICATION REQUIREMENT CALCULATION

MANURE SOURCE	ANIMAL TYPE	TYPE OF MANURE	STATE	APPLICATION METHOD	Units 1000 GAL / TON	AMOUNT 1,000 GAL / TON	NH3 lb/unit	ORG. N lb/unit	TKN lb/unit	P2O5 lb/unit	K2O lb/unit	PAN lb/unit	N ORG CREDIT lb/unit
4088 ME	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2710	3	0.7	3.7	0.5	4.5	3.2	0.2
4089 LV	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2120	3.8	0.3	4.1	0.6	5.1	3.8	0.1
4090 ER	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2900	1.55	0.3	1.85	0.6	6.4	1.6	0.1
4091 LW	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2560	2.8	0.6	3.4	0.5	5.1	3.0	0.2
4092 LS	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	4050	2.3	0.8	3.1	0.9	8.1	2.5	0.2

2025

MANURE SOURCE	ANIMAL TYPE	TYPE OF MANURE	STATE	APPLICATION METHOD	Units 1000 GAL / TON	AMOUNT 1,000 GAL / TON	NH3 lb/unit	ORG. N lb/unit	TKN lb/unit	P2O5 lb/unit	K2O lb/unit	PAN lb/unit	N ORG CREDIT lb/unit
4088 ME	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2710	3	0.7	3.7	0.5	4.5	3.2	0.2
4089 LV	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2120	3.8	0.3	4.1	0.6	5.1	3.8	0.1
4090 ER	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2900	1.55	0.3	1.85	0.6	6.4	1.6	0.1
4091 LW	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2560	2.8	0.6	3.4	0.5	5.1	3.0	0.2
4092 LS	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	4050	2.3	0.8	3.1	0.9	8.1	2.5	0.2

2026

MANURE SOURCE	ANIMAL TYPE	TYPE OF MANURE	STATE	APPLICATION METHOD	Units 1000 GAL / TON	AMOUNT 1,000 GAL / TON	NH3 lb/unit	ORG. N lb/unit	TKN lb/unit	P2O5 lb/unit	K2O lb/unit	PAN lb/unit	N ORG CREDIT lb/unit
4088 ME	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2710	3	0.7	3.7	0.5	4.5	3.2	0.2
4089 LV	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2120	3.8	0.3	4.1	0.6	5.1	3.8	0.1
4090 ER	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2900	1.55	0.3	1.85	0.6	6.4	1.6	0.1
4091 LW	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2560	2.8	0.6	3.4	0.5	5.1	3.0	0.2
4092 LS	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	4050	2.3	0.8	3.1	0.9	8.1	2.5	0.2

2027

MANURE SOURCE	ANIMAL TYPE	TYPE OF MANURE	STATE	APPLICATION METHOD	Units 1000 GAL / TON	AMOUNT 1,000 GAL / TON	NH3 lb/unit	ORG. N lb/unit	TKN lb/unit	P2O5 lb/unit	K2O lb/unit	PAN lb/unit	N ORG CREDIT lb/unit
4088 ME	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2710	3	0.7	3.7	0.5	4.5	3.2	0.2
4089 LV	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2120	3.8	0.3	4.1	0.6	5.1	3.8	0.1
4090 ER	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2900	1.55	0.3	1.85	0.6	6.4	1.6	0.1
4091 LW	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2560	2.8	0.6	3.4	0.5	5.1	3.0	0.2
4092 LS	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	4050	2.3	0.8	3.1	0.9	8.1	2.5	0.2

2028

MANURE SOURCE	ANIMAL TYPE	TYPE OF MANURE	STATE	APPLICATION METHOD	Units 1000 GAL / TON	AMOUNT 1,000 GAL / TON	NH3 lb/unit	ORG. N lb/unit	TKN lb/unit	P2O5 lb/unit	K2O lb/unit	PAN lb/unit	N ORG CREDIT lb/unit
4088 ME	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2710	3	0.7	3.7	0.5	4.5	3.2	0.2
4089 LV	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2120	3.8	0.3	4.1	0.6	5.1	3.8	0.1
4090 ER	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2900	1.55	0.3	1.85	0.6	6.4	1.6	0.1
4091 LW	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2560	2.8	0.6	3.4	0.5	5.1	3.0	0.2
4092 LS	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	4050	2.3	0.8	3.1	0.9	8.1	2.5	0.2

2029

MANURE SOURCE	ANIMAL TYPE	TYPE OF MANURE	STATE	APPLICATION METHOD	Units 1000 GAL / TON	AMOUNT 1,000 GAL / TON	NH3 lb/unit	ORG. N lb/unit	TKN lb/unit	P2O5 lb/unit	K2O lb/unit	PAN lb/unit	N ORG CREDIT lb/unit
4088 ME	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2710	3	0.7	3.7	0.5	4.5	3.2	0.2
4089 LV	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2120	3.8	0.3	4.1	0.6	5.1	3.8	0.1
4090 ER	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2900	1.55	0.3	1.85	0.6	6.4	1.6	0.1
4091 LW	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2560	2.8	0.6	3.4	0.5	5.1	3.0	0.2
4092 LS	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	4050	2.3	0.8	3.1	0.9	8.1	2.5	0.2

2030

MANURE SOURCE	ANIMAL TYPE	TYPE OF MANURE	STATE	APPLICATION METHOD	Units 1000 GAL / TON	AMOUNT 1,000 GAL / TON	NH3 lb/unit	ORG. N lb/unit	TKN lb/unit	P2O5 lb/unit	K2O lb/unit	PAN lb/unit	N ORG CREDIT lb/unit
4088 ME	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2710	3	0.7	3.7	0.5	4.5	3.2	0.2
4089 LV	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2120	3.8	0.3	4.1	0.6	5.1	3.8	0.1
4090 ER	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2900	1.55	0.3	1.85	0.6	6.4	1.6	0.1
4091 LW	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	2560	2.8	0.6	3.4	0.5	5.1	3.0	0.2
4092 LS	SWINE	ANAEROBIC	LIQUID	INJECTED	1000 GAL	4050	2.3	0.8	3.1	0.9	8.1	2.5	0.2

MAURER-STUTZ

TABLE 6.5 - PLANNED CROPS AND FERTILIZER RECOMMENDATIONS

PROJECT: Murphy-Brown, LLC. - Mt. Erie Sow
PROJECT NO.: 23804009.01

COMMON MANAGEMENT UNIT #1: Hohlbaugh

PLANNED CROPS	REALISTIC ANNUAL YIELD GOAL	CROP N (lbs/acre)	TOTAL P REQUIRED BY CROPS (lbs/acre)	TOTAL K REQUIRED BY CROPS (lbs/acre)
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7

ALTERNATIVE CROP	REALISTIC ANNUAL YIELD GOAL	CROP N (lbs/acre)	TOTAL P REQUIRED BY CROP (lbs/acre)	TOTAL K REQUIRED BY CROP (lbs/acre)
DC Soybeans	50 bu/ac	240	43	65
Wheat Grain-Straw	81 bu/ac	185	55	162
Corn Stover	1.5 Ton/AC	0	11	45
Corn Silage	19 Ton/AC	240	59	178.6
Sorghum Grain	90 bu/ac	101	38	18.9

COMMON MANAGEMENT UNIT #2: Shan

PLANNED CROPS OR OTHER USE	REALISTIC ANNUAL YIELD GOAL	CROP N (lbs/acre)	TOTAL P REQUIRED BY CROPS (lbs/acre)	TOTAL K REQUIRED BY CROPS (lbs/acre)
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7

ALTERNATIVE CROP	REALISTIC ANNUAL YIELD GOAL	CROP N (lbs/acre)	TOTAL P REQUIRED BY CROP (lbs/acre)	TOTAL K REQUIRED BY CROP (lbs/acre)
DC Soybeans	50 bu/ac	240	43	65
Wheat Grain-Straw	81 bu/ac	185	55	162
Corn Stover	1.5 Ton/AC	0	11	45
Corn Silage	19 Ton/AC	240	59	178.6
Sorghum Grain	90 bu/ac	101	38	18.9

COMMON MANAGEMENT UNIT #3: Eckel

PLANNED CROPS OR OTHER USE	REALISTIC ANNUAL YIELD GOAL	CROP N (lbs/acre)	TOTAL P REQUIRED BY CROPS (lbs/acre)	TOTAL K REQUIRED BY CROPS (lbs/acre)
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7

ALTERNATIVE CROP	REALISTIC ANNUAL YIELD GOAL	CROP N (lbs/acre)	TOTAL P REQUIRED BY CROP (lbs/acre)	TOTAL K REQUIRED BY CROP (lbs/acre)
DC Soybeans	50 bu/ac	240	43	65
Wheat Grain-Straw	81 bu/ac	185	55	162
Corn Stover	1.5 Ton/AC	0	11	45
Corn Silage	19 Ton/AC	240	59	178.6
Sorghum Grain	90 bu/ac	101	38	18.9

COMMON MANAGEMENT UNIT #4: Lynch

PLANNED CROPS OR OTHER USE	REALISTIC ANNUAL YIELD GOAL	CROP N (lbs/acre)	TOTAL P REQUIRED BY CROPS (lbs/acre)	TOTAL K REQUIRED BY CROPS (lbs/acre)
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7
Corn Grain	185 bu/ac	240	102	51.8
Soybeans	49 bu/ac	240	42	63.7

ALTERNATIVE CROP	REALISTIC ANNUAL YIELD GOAL	CROP N (lbs/acre)	TOTAL P REQUIRED BY CROP (lbs/acre)	TOTAL K REQUIRED BY CROP (lbs/acre)
DC Soybeans	50 bu/ac	240	43	65
Wheat Grain-Straw	81 bu/ac	185	55	162
Corn Stover	1.5 Ton/AC	0	11	45
Corn Silage	19 Ton/AC	240	59	178.6
Sorghum Grain	90 bu/ac	101	38	18.9

MAURER-STUTZ

TABLE 6.6A - CALCULATING MANURE APPLICATION RATES

PROJECT: Murphy-Brown, LLC. - Mt. Erie Sow Farm
PROJECT NO.: 23804009.01

EQUATIONS TO USE WHEN CALCULATING MANURE APPLICATION RATES

Manure sources should be sampled yearly and the application rates should be calculated before each application season.

Manure application rates and the amount of manure applied records should be kept (see record keeping forms in Section 5)

TERMS: **TOTAL PAN:** Plant Available Nitrogen comprises of organic and ammonium nitrogen.
Organic Nitrogen: Slow releasing N which must be release before plants can use it. It is released over three cropping years after initial application through mineralization. This plan takes into account application every other year.
Ammonium Nitrogen: Equivalent to commercial fertilizer and can be used by plants in the appliation year. Subject to volitization based on method of application.
Total P2O5: Phophorous available to the plant after mineralization based on the type of manure applied.
Total K2O: Potassium available to the plant afeter mineralization based on the type of manure applied.

Step 1: Estimate the Available Nutrients (N,P,K) from the manure source (liquid and solid):

EQN 1: Ammonium N = Manure NH3 x (1 - VOL %) = LBS NH3/UNIT
EQN 2: Organic N = Manure ORGN x MIN % = LBS NORG/UNIT
EQN 3: Organic N Credit = (NORG/UNIT x 1st Year Factor) + (NORG/UNIT x 2nd Year Factor) + (NORG/UNIT x 3rd Year Factor) = LBS NORG CREDIT/UNIT
EQN 4: Total PAN = EQN 1 + EQN 2 + EQN 3= LBS PAN/UNIT

EQN 5: Total P2O5 = Manure P2O5 x MIN % = LBS P2O5/UNIT
EQN 6: Total K2O = Manure K2O x MIN % = LBS K2O/UNIT

VOLITALIZATION (VOL %)		
APPLICATION TYPE	MANURE TYPE	AMMONIA LOSS
BROADCAST W/O INCORP	SOLID	30%
BROADCAST W/O INCORP	LIQUID	25%
BROADCAST W/ INCORP	SOLID	5%
BROADCAST W/ INCORP	LIQUID	5%
INJECTED	LIQUID	2%
IRRIGATION	LIQUID	40%

ORGANIC NITROGEN RELEASE	
CREDIT	FACTOR
1st Year after Application	50%
2nd Year after Application	25%
3rd Year After Application	12.5%

MINERALIZATION (MIN %)				
ANIMAL TYPE	MANURE TYPE	ORGANIC NITROGEN	P2O5	K20
BEEF, DAIRY	SOLID W/O BED	35%	90%	93%
BEEF, DAIRY	SOLID W/ BED	25%	90%	93%
BEEF, DAIRY	ANAEROBIC	30%	90%	93%
BEEF, DAIRY	AEROBIC	25%	90%	93%
SWINE	FRESH	50%	90%	93%
SWINE	ANAEROBIC	35%	90%	93%
SWINE	AEROBIC	30%	90%	93%
POULTRY	DEEP PIT	60%	90%	93%
POULTRY	SOLID W/O BED	60%	90%	93%
POULTRY	SOLID W/ BED	60%	90%	93%

Step 2: Determine Required Nutrients for Planned Crop *(see section 6.5 for planned crops)*

Step 3: Estimate Manure Application Rate:

Nitrogen Based: $\frac{\text{Crop lb N/ac}}{\text{Available lb PAN/UNIT}}$ = Application Rate (UNIT/ac)

Phosphorous Based: $\frac{\text{Crop lb P2O5/ac}}{\text{Available lb P2O5/UNIT}}$ = Application Rate (UNIT/ac)

Potassium Based: $\frac{\text{Crop lb K2O/ac}}{\text{Available lb K2O/UNIT}}$ = Application Rate (UNIT/ac)

See Section 6.4 for Nutrient Analysis and Manure and Application Type
Use reference tables on this page for Mineralization and Volitalization Rates. Values were taken from MWPS and NRCS AWMFH.

MAURER-STUTZ

TABLE 4.6B - MANURE SOURCE APPLICATION CALCULATIONS

PROJECT: Murphy-Brown, LLC. - Mt. Erie Sow Farm
PROJECT NO.: 23804009.01

Step 2: Determine Required Nutrients for Planned Crop *(see section 6.5 for planned crops for the crop management units)*
The following crops are planned for one year. This planned crop is used for all of the source manure application rate calculations in this section.

PLANNED CROP	Crop Year	N	P2O5	K2O
Corn after Soybeans	1st year	240	102	51.8
Soybeans	2nd year	240	42	63.7

CAFO APPLICATION REQUIREMENTS (35 IAC 502.620 (i,k))

LESS THAN 60 INCHES OF UNCONSOLIDATED MATERIAL OVER BEDROCK	NO
MIN SOIL DEPTH TO SHWT IS LESS THAN OR EQUAL TO 2 FEET	NO

REDUCES THE NITROGEN APPLICATION RATE BY 50%

MANURE SOURCE 1

Step 1: Estimate the Available Nutrients (N,P,K) from the manure source (liquid and solid):

SOURCE	4088 ME
NUTRIENTS	lb/1000 GAL
TOTAL N	3.7
AMMONIUM N	3
ORGANIC N	0.7
P2O5	0.5
K2O	4.5

Ammonium N = 3 x 0.98 = 2.9 lbs/1000 GAL
Organic N = 0.7 x 0.35 = 0.2 lbs/1000 GAL
ORG N CREDIT = 0.7 x 0.35 x 50% + 0.7 x 0.35 x 12.5% = 0.2 lbs/1000 GAL
Total PAN = 2.9 + 0.2 + 0.2 = 3.3 lbs/1000 GAL

Total P2O5 = 0.5 x 0.9 = 0.5 lbs/1000 GAL
Total K2O = 4.5 x 0.93 = 4.2 lbs/1000 GAL

Step 3: Estimate Manure Application Rate:

N: $\frac{240 \text{ lb N/ac}}{3.3 \text{ lb PAN/1000 GAL}}$ = 72.7 1000 GAL/ac

P2O5: $\frac{143 \text{ lb P2O5/ac}}{0.5 \text{ lb P2O5/1000 GAL}}$ = 286.8 1000 GAL/ac

K2O: $\frac{116 \text{ lb K2O/ac}}{4.2 \text{ lb K2O/1000 GAL}}$ = 27.5 1000 GAL/ac

Application Timing: EVERY OTHER YEAR

SELECT THE MINIMUM APPLICATION RATE FROM THE CALCULATED RATES:

72.7 1000 GAL/ac - Nitrogen (N) Based

Timing of Application Notes: *Manure should be applied during optimum soil conditions. The manure will be applied with drag hose and injected or incorporated with in 24 hours. This will comply with all applicable incorporation setbacks and will prevent runoff and odor.*

MANURE SOURCE 2

Step 1: Estimate the Available Nutrients (N,P,K) from the manure source (liquid and solid):

SOURCE	4089 LV
NUTRIENTS	lb/1000 GAL
TOTAL N	4.1
AMMONIUM N	3.8
ORGANIC N	0.3
P2O5	0.6
K2O	5.1

Ammonium N = 3.8 x 0.98 = 3.7 lbs/1000 GAL
Organic N = 0.3 x 0.35 = 0.1 lbs/1000 GAL
ORG N CREDIT = 0.3 x 0.35 x 50% + 0.3 x 0.35 x 12.5% = 0.1 lbs/1000 GAL
Total PAN = 3.7 + 0.1 + 0.1 = 3.9 lbs/1000 GAL

Total P2O5 = 0.6 x 0.9 = 0.5 lbs/1000 GAL
Total K2O = 5.1 x 0.93 = 4.7 lbs/1000 GAL

Step 3: Estimate Manure Application Rate:

N: $\frac{240 \text{ lb N/ac}}{3.9 \text{ lb PAN/1000 GAL}}$ = 61.5 1000 GAL/ac

P2O5: $\frac{143 \text{ lb P2O5/ac}}{0.5 \text{ lb P2O5/1000 GAL}}$ = 286.8 1000 GAL/ac

K2O: $\frac{116 \text{ lb K2O/ac}}{4.7 \text{ lb K2O/1000 GAL}}$ = 24.6 1000 GAL/ac

Application Timing: EVERY OTHER YEAR

SELECT THE MINIMUM APPLICATION RATE FROM THE CALCULATED RATES:

61.5 1000 GAL/ac - Nitrogen (N) Based

Timing of Application Notes: *Manure should be applied during optimum soil conditions. The manure will be applied with drag hose and injected or incorporated with in 24 hours. This will comply with all applicable incorporation setbacks and will prevent runoff and odor.*

MANURE SOURCE 3

Step 1: Estimate the Available Nutrients (N,P,K) from the manure source (liquid and solid):

SOURCE	4090 ER
NUTRIENTS	lb/1000 GAL
TOTAL N	1.85
AMMONIUM N	1.55
ORGANIC N	0.3
P2O5	0.6
K2O	6.4

Ammonium N = 1.55 x 0.98 = 1.5 lbs/1000 GAL
Organic N = 0.3 x 0.35 = 0.1 lbs/1000 GAL
ORG N CREDIT = 0.3 x 0.35 x 50% + 0.3 x 0.35 x 12.5% = 0.1 lbs/1000 GAL
Total PAN = 1.5 + 0.1 + 0.1 = 1.7 lbs/1000 GAL

Total P2O5 = 0.6 x 0.9 = 0.5 lbs/1000 GAL
Total K2O = 6.4 x 0.93 = 6 lbs/1000 GAL

Step 3: Estimate Manure Application Rate:

Application Timing: EVERY OTHER YEAR

N: $\frac{\text{240 lb N/ac}}{\text{1.7 lb PAN/1000 GAL}}$ = 141.2 1000 GAL/ac

P2O5: $\frac{\text{143 lb P2O5/ac}}{\text{0.5 lb P2O5/1000 GAL}}$ = 286.8 1000 GAL/ac

K2O: $\frac{\text{116 lb K2O/ac}}{\text{6 lb K2O/1000 GAL}}$ = 19.3 1000 GAL/ac

SELECT THE MINIMUM APPLICATION RATE FROM THE CALCULATED RATES:

141.2 1000 GAL/ac - Nitrogen (N) Based

Timing of Application Notes:	*Manure should be applied during optimum soil conditions. The manure will be applied with drag hose and injected or incorporated with in 24 hours. This will comply with all applicable incorporation setbacks and will prevent runoff and odor.*

MANURE SOURCE 4

Step 1: Estimate the Available Nutrients (N,P,K) from the manure source (liquid and solid):

SOURCE	4091 LW
NUTRIENTS	lb/1000 GAL
TOTAL N	3.4
AMMONIUM N	2.8
ORGANIC N	0.6
P2O5	0.5
K2O	5.1

Ammonium N = 2.8 x 0.98 = 2.7 lbs/1000 GAL
Organic N = 0.6 x 0.35 = 0.2 lbs/1000 GAL
ORG N CREDIT = 0.6 x 0.35 x 50% + 0.6 x 0.35 x 12.5% = 0.1 lbs/1000 GAL
Total PAN = 2.7 + 0.2 + 0.1 = 3 lbs/1000 GAL

Total P2O5 = 0.5 x 0.9 = 0.5 lbs/1000 GAL
Total K2O = 5.1 x 0.93 = 4.7 lbs/1000 GAL

Step 3: Estimate Manure Application Rate:

Application Timing: EVERY OTHER YEAR

N: $\frac{\text{240 lb N/ac}}{\text{3 lb PAN/1000 GAL}}$ = 80 1000 GAL/ac

P2O5: $\frac{\text{143 lb P2O5/ac}}{\text{0.5 lb P2O5/1000 GAL}}$ = 286.8 1000 GAL/ac

K2O: $\frac{\text{116 lb K2O/ac}}{\text{4.7 lb K2O/1000 GAL}}$ = 24.6 1000 GAL/ac

SELECT THE MINIMUM APPLICATION RATE:

80 1000 GAL/ac - Nitrogen (N) Based

Timing of Application Notes:	*Manure should be applied during optimum soil conditions. The manure will be applied with drag hose. This will comply with all applicable incorporation setbacks.*

MANURE SOURCE 5

Step 1: Estimate the Available Nutrients (N,P,K) from the manure source (liquid and solid):

SOURCE	4092 LS
NUTRIENTS	lb/1000 GAL
TOTAL N	3.1
AMMONIUM N	2.3
ORGANIC N	0.8
P2O5	0.9
K2O	8.1

Ammonium N = 2.3 x 0.98 = 2.3 lbs/1000 GAL
Organic N = 0.8 x 0.35 = 0.3 lbs/1000 GAL
ORG N CREDIT = 0.8 x 0.35 x 50% + 0.8 x 0.35 x 12.5% = 0.2 lbs/1000 GAL
Total PAN = 2.3 + 0.3 + 0.2 = 2.8 lbs/1000 GAL

Total P2O5 = 0.9 x 0.9 = 0.8 lbs/1000 GAL
Total K2O = 8.1 x 0.93 = 7.5 lbs/1000 GAL

Step 3: Estimate Manure Application Rate:

Application Timing: EVERY OTHER YEAR

N: $\frac{\text{240 lb N/ac}}{\text{2.8 lb PAN/1000 GAL}}$ = 85.7 1000 GAL/ac

P2O5: $\frac{\text{143 lb P2O5/ac}}{\text{0.8 lb P2O5/1000 GAL}}$ = 179.3 1000 GAL/ac

K2O: $\frac{\text{116 lb K2O/ac}}{\text{7.5 lb K2O/1000 GAL}}$ = 15.4 1000 GAL/ac

SELECT THE MINIMUM APPLICATION RATE:

85.7 1000 GAL/ac - Nitrogen (N) Based

Timing of Application Notes:	*Manure should be applied during optimum soil conditions. The manure will be applied with drag hose and injected or incorporated with in 24 hours. This will comply with all applicable incorporation setbacks and will prevent runoff and odor.*

MAURER-STUTZ

Table 6.9 PROJECTED MANURE INVENTORY

PROJECT: Murphy-Brown, LLC. - Mt. Erie Sow

PROJECT NO.: 23804009.01

Manure Source	Plan Period	On Hand at Start of Period	Total Generated	Total Applied	Total Exported	Total Transferred Out	On Hand at End of Period	Units
4088 ME	2023	0	2710	0	2710		0	1000 GAL
4089 LV	2023	0	2120	0	2120		0	1000 GAL
4090 ER	2023	0	2900	0	2900		0	1000 GAL
4091 LW	2023	0	2560	0	2560		0	1000 GAL
4092 LS	2023	0	4050	0	4050		0	1000 GAL
4088 ME	2024	0	2710	0	2710		0	1000 GAL
4089 LV	2024	0	2120	0	2120		0	1000 GAL
4090 ER	2024	0	2900	0	2900		0	1000 GAL
4091 LW	2024	0	2560	0	2560		0	1000 GAL
4092 LS	2024	0	4050	0	4050		0	1000 GAL
4088 ME	2025	0	2710	0	2710		0	1000 GAL
4089 LV	2025	0	2120	0	2120		0	1000 GAL
4090 ER	2025	0	2900	0	2900		0	1000 GAL
4091 LW	2025	0	2560	0	2560		0	1000 GAL
4092 LS	2025	0	4050	0	4050		0	1000 GAL
4088 ME	2026	0	2710	0	2710		0	1000 GAL
4089 LV	2026	0	2120	0	2120		0	1000 GAL
4090 ER	2026	0	2900	0	2900		0	1000 GAL
4091 LW	2026	0	2560	0	2560		0	1000 GAL
4092 LS	2026	0	4050	0	4050		0	1000 GAL
4088 ME	2027	0	2710	0	2710		0	1000 GAL
4089 LV	2027	0	2120	0	2120		0	1000 GAL
4090 ER	2027	0	2900	0	2900		0	1000 GAL
4091 LW	2027	0	2560	0	2560		0	1000 GAL
4092 LS	2027	0	4050	0	4050		0	1000 GAL
4088 ME	2028	0	2710	0	2710		0	1000 GAL
4089 LV	2028	0	2120	0	2120		0	1000 GAL
4090 ER	2028	0	2900	0	2900		0	1000 GAL
4091 LW	2028	0	2560	0	2560		0	1000 GAL
4092 LS	2028	0	4050	0	4050		0	1000 GAL

6.10. Manure Export Agreements

Manure Lease Agreements

Fields	Owner	Total
B-1	Hohlbaugh	35.5
B-2	Hohlbaugh	20.3
B-3	Hohlbaugh	71.9
B-4	Hohlbaugh	23.1
B-5	Hohlbaugh	41
B-6	Hohlbaugh	68.4
B-7	Hohlbaugh	35
B-8	Hohlbaugh	47.8
B-9	Hohlbaugh	25.5
B-10	Hohlbaugh	32.5
B-11	Hohlbaugh	16.4
B-12	Hohlbaugh	41.7
B-21	Hohlbaugh	22.4
B-22A	Hohlbaugh	17.2
S-24	Shan	106.1
S-25	Shan	76.9
S-27	Shan	118.8
S-28	Shan	113.2
S-29	Shan	74.5
S-30	Shan	37.3
S-31E	Shan	54.2
S-31W	Shan	62.5
S-32	Shan	59.8
S-33	Shan	36.4
S-34	Shan	71.9
S-35	Shan	34
S-36	Shan	111.8
E-16	Eckel	20.5
E-17	Eckel	59.4
E-18	Eckel	39.3
E-19	Eckel	71.7
E-20	Eckel	115.5
E-35	Eckel	26.8
E-38	Eckel	204.6
H-36	Atterberry	192.1
H-37	Hohlbaugh	51.4
H-38	Hohlbaugh	68.9
L-39	Lynch	149.8
		2456.1

EFFLUENT AGREEMENT

THIS AGREEMENT made effective as of ~~July~~ November 15, 1999, by and between ALLIANCE FARMS COOPERATIVE ASSOCIATION, a Colorado cooperative association (referred to herein as "Company"), and BILL L. BAILEY and NORMA JEAN BAILEY, husband and wife (referred to herein as "Owner").

WHEREAS, Company owns and operates certain hog operations located on certain real property in Wayne County, Illinois, the legal description of which real property is set forth on Exhibit "A" hereto ("Company's Property");

WHEREAS, Company and Owner desire that effluent produced from Company's hog operations located on Company's Property be applied to certain real property of Owner in Wayne County, Illinois, the legal description of which real property is set forth on Exhibit "B" hereto ("Owner's Property"); and

WHEREAS, Owner is willing to grant a right and license to Company for the purpose of allowing Company to apply effluent to Owner's Property in accordance with the terms and conditions herein contained.

NOW, THEREFORE, in consideration of the mutual covenants contained herein and for Ten Dollars ($10.00) in hand paid by Company to Owner and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. <u>Grant of Right and License</u>. Owner hereby grants and conveys to Company, for a period of thirty (30) years from the effective date of this Agreement, the right and license to apply the effluent produced by Company's hog operations located or to be located on Company's Property over and upon Owner's Property, together with all necessary right of ingress and egress over, across and upon Owner's land for that purpose.

2. <u>Effluent</u>. Company shall apply said effluent onto Owner's Property through application equipment provided by Company. To the extent that Company generates effluent from its hog operations on Company's Property that is in excess of the effluent that is applied to Owner's Property in accordance with this Agreement (or if Owner otherwise advises Company that effluent is not to be applied to Owner's Property), Company shall have the right to dispose of such effluent in any manner, including through application upon real property not owned by Owner.

3. <u>Timetable for Application</u>. Unless the parties otherwise agree, effluent will be applied to Owner's Property prior to planting in the spring or after harvest in the fall; provided, however, at least seven (7) days' advance notice is given to Owner. If, in the reasonable judgment of Owner, the effluent application process will damage the soil structure because of inclement weather, or it is not reasonably practicable to timely incorporate the effluent into the soil due to

other good and compelling reasons, Owner shall have the right to defer application of the effluent for up to thirty (30) days after Company's scheduled application date. If Owner does not allow the effluent to be applied to Owner's Property by the expiration of such 30-day period, Company shall have the right to dispose of such effluent in any manner, including through application upon real property not owned by Owner.

4. Soil and Effluent Analysis. Within one month before the effluent application for the fall of 1999, Owner shall submit soil samples of Owner's Property for analysis by one or more agronomists or soil scientists selected by Owner and reasonably acceptable to Company (the "Soil Analyst"), which soil samples shall be obtained at the rate of one sample for each twenty (20) acres of Owner's Property. Before applying effluent to Owner's Property in the fall of 1999, Company shall submit representative samples of the effluent proposed to be applied to Owner's Property to one or more agronomists or soil scientists selected by Company (the "Effluent Analyst") for analysis. After these initial soil and effluent analyses, during the term of this Agreement soil samples shall be analyzed by Soil Analyst once every two years and effluent samples shall be analyzed by Effluent Analyst before each application. Prior to the application of effluent to Owner's Property, Owner shall cause a copy of the Soil Analyst's analysis to be furnished to Company and Company shall cause a copy of the Effluent Analyst's analysis to be furnished to Owner. Company shall not apply effluent to Owner's Property at a rate in excess of any agronomic rate recommendations of a soil science educator with the University of Illinois Extension, College of Agriculture, University of Illinois at Urbana-Champaign. Company shall pay all charges of the Effluent Analyst for the effluent analysis, and Owner shall pay all charges of the Soil Analyst for the soil analysis and recommendations.

5. Compliance with Law. Company and Owner each shall use their respective best efforts to comply with all federal, state and local environmental laws (to the extent such laws are applicable to the respective party), including, but not limited to, all laws and regulations of the Federal Environmental Protection Agency and the Illinois Environmental Protection Agency, the Livestock Management Facilities Act, 510 ILCS 77/1 et seq. and any rules and regulations promulgated by the Illinois Department of Agriculture regarding the design criteria for field application of livestock waste and the application and incorporation of animal waste. Company shall be responsible for complying with all licensing requirements, if any, promulgated by the aforesaid authorities.

6. Indemnity. Company agrees to indemnify and hold harmless Owner against all adverse claims, suits, administrative penalties, judgments, decrees, costs, expenses, including Owner's reasonable attorney fees, or other monetary loss, including those resulting from damage to property, which, in any such case, is caused by Company's application of effluent to Owner's Property in violation of Section 5 above, except to the extent caused by Owner.

7. No Monetary Payments. No monetary payments are to be made by either party to the other under this Agreement for the application of effluent to Owner's Property or for the right and license granted to Company under this Agreement. Owner acknowledges that Owner shall

receive adequate consideration for the right and license granted hereby in the form of the anticipated increased soil enrichment and fertility of Owner's Property realized from the application of effluent and the resulting anticipated increase in crop yields that may be produced on Owner's Property. There shall be no failure of consideration if the yields do not increase or soil enrichment does not occur because the parties understand it is difficult, if not impossible, to predict with any degree of accuracy any increases in the crop production or improvement in soil enrichment.

8. Application Equipment. The application equipment and labor required to apply the effluent onto Owner's Property shall be provided by, and at the expense of, Company, and such equipment shall remain the property of Company. When not in use, such equipment shall not be stored on Owner's Property. Company is granted the right and license to enter onto Owner's Property for inspection prior to application of effluent, as well as for purposes of actually applying the effluent.

9. Arbitration. In the event of any controversy arising out of or relating to this Agreement, or any breach hereof, the dispute shall be submitted to binding arbitration in accordance with the rules of the Uniform Arbitration Act and conducted in the Wayne County, Illinois. Such arbitration shall be initiated by either party by notifying the other party in writing and by requesting the American Arbitration Association to select a panel of five (5) arbitrators, which arbitrators shall consist of persons who are knowledgeable in agronomy, soil science, livestock production or other disciplines (depending on the matter in controversy) and may include an extension educator with the University of Illinois Extension, College of Agriculture, University of Illinois at Urbana-Champaign. Alternate strikes shall be made to the panel commencing with the party requesting the arbitration until one name remains. Such individual shall be the arbitrator for the controversy. The party requesting the arbitration shall notify the arbitrator, who shall hold a hearing(s) within thirty (30) days of the notice. The arbitrator shall render a decision within twenty (20) days after the conclusion of the hearing(s). Judgment upon the award rendered by the arbitrator may be entered in any court having jurisdiction thereof. All costs and fees for such arbitration will be divided equally between the parties. During any dispute under this Agreement, Owner and Company shall continue to fulfill their respective obligations under this Agreement, unless the subject matter of the dispute is of such a nature that this is by no means possible until the dispute has been finally resolved.

10. Notices. Any notice provided for or concerning this Agreement shall be deemed sufficiently given when sent by certified or registered mail addressed as follows:

If to Owner: Bill L. Bailey and Norma Jean Bailey
R. R. 1
Box 89
Xenia, IL 62899

If to Company: Alliance Farms Cooperative Association
c/o Farmland Foods
10150 N. Executive Hills Blvd.
Kansas City, MO 64153
Attn: Wayne N. Snyder

or to such other address or person as a party may designate as its notice address by written notice to the other party given in accordance with this Section. Owner hereby appoints Bill L. Bailey, to be the true and lawful attorney of Owner for all matters in connection with this Agreement, including the compromise or resolution of any dispute between the parties relating to this Agreement.

11. Governing Law. It is agreed that this Agreement shall be governed by, construed, and enforced in accordance with the laws of the State of Illinois.

12. Recording. This Agreement shall be recorded in the real estate records of Wayne County, Illinois, and the terms hereof shall be binding on the heirs, personal representatives, successors, and permitted assigns of each of the parties hereto. Company shall not make any assignment of this Agreement without first obtaining the written consent of Owner, which consent will not unreasonably be withheld.

13. Entire Agreement; Amendment. This Agreement shall constitute the entire agreement of the parties with respect to the subject matter hereof, and any oral or written agreement, understanding or representations made prior to the date of this Agreement and concerning the subject matter of this Agreement shall not be binding upon any party hereto except to the extent incorporated in this Agreement. Any changes, modifications, adjustments or amendments to this Agreement must be in writing, signed by each party.

14. Relationship. It is understood that nothing contained in this Agreement shall be considered as creating an employer-employee relationship, a partnership, or a joint venture between the parties hereto.

15. Termination upon Violation. In the event Company disposes of effluent on Owner's Property in violation of Sections 4 and 5 above, the right and license granted hereunder shall be subject to revocation upon the provision by Owner to Company of thirty (30) days' notice to that effect and thereupon this Agreement shall be of no further force and effect.

16. Conveyance of Owner's Property. Any person or entity acquiring any right, title or interest in all or any portion of Owner's Property during the term of this Agreement shall take subject to the terms hereof. If Owner sells or conveys all or any portion of Owner's Property during the term of this Agreement, Owner shall provide any subsequent holder of an interest in Owner's Property with notice of this Agreement prior to sale or conveyance and shall obtain the

agreement of such subsequent holder to be bound by the terms hereof (which agreement shall be on terms reasonably acceptable to Company).

17. Headings. The headings of the sections of this Agreement are solely for the convenience and reference of the parties and shall not be used to explain, modify, simplify, or aid in the interpretation of the provisions of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

OWNER:

Bill L Bailey

BILL L. BAILEY

Norma J Bailey

NORMA JEAN BAILEY

COMPANY:

ALLIANCE FARMS COOPERATIVE ASSOCIATION, a Colorado cooperative association

By: Wayne N. Snyder

STATE OF ILLINOIS)
) ss:
COUNTY OF WAYNE)

The foregoing instrument was acknowledged before me on this 6 day of ~~June~~ July, 1999 by BILL L. BAILEY. Witness my hand and notarial seal the day and year in this certificate above written.

(SEAL)

Name: Kasey B. Austin
Notary Public

My commission expires: 6-17-2002

OFFICIAL SEAL
KASEY B. AUSTIN
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 6-17-2002

STATE OF ILLINOIS)
) ss:
COUNTY OF WAYNE)

The foregoing instrument was acknowledged before me on this 6 day of ~~June~~ July, 1999 by NORMA JEAN BAILEY. Witness my hand and notarial seal the day and year in this certificate above written.

(SEAL)

Name: Kasey B Austin
Notary Public

My commission expires: 6-17-2002

OFFICIAL SEAL
KASEY B. AUSTIN
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 6-17-2002

STATE OF Missouri)
) ss:
COUNTY OF Platte)

The foregoing instrument was acknowledged before me on this 15th day of ~~June~~ November, 1999 by WAYNE N. SNYDER as President of Alliance Farms Cooperative Association, a Colorado cooperative association. Witness mv hand and notarial seal the day and year in this certificate above written.

(SEAL)

Name: DeLonna Wise
Notary Public

My commission expires: 4-11-2003

DeLonna Wise, Notary Public
Platte County, State of Missouri
My Commission Expires 4/11/2003

EXHIBIT A

Company's Property

B/G/F SITES 201& 203

A part of Section 36, Township 2 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at the southeast corner of said Section 36; thence N. 0° 38' 26" W., along the east line of Section 36, a distance of 1199.3 feet to the point of beginning; thence S. 89° 21' 34" W. a distance of 600 feet to a point; thence N. 0° 38' 26" W. a distance of 95 feet to a point; thence S. 89° 21' 34" W. a distance of 730 feet to a point; thence N. 0° 38' 26" W. a distance of 635 feet to a point; thence N. 89° 21' 34" E. a distance of 310 feet to a point; thence N. 0° 38' 26" W. a distance of 1070 feet to a point; thence N. 89° 21' 34" E. a distance of 580 feet to a point; thence S. 0° 38' 26" E. a distance of 312 feet to a point; thence N. 89° 21' 34" E. a distance of 340 feet to a point; thence N. 0° 38' 26" W. a distance of 540 feet to a point; thence N. 89° 21' 34" E. a distance of 100 feet to a point on the east line of Section 36; thence S. 0° 38' 26" E., along the east line of Section 1, a distance of 2028 feet to the point of beginning; containing 43.8 acres, more or less.

B/G/F SITE 202

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence N. 0° 00' 00" E., along the east line of Section 1, a distance of 900 feet to a point, said point being the point of beginning; thence continuing N. 0° 00' 00" E., along the east line of Section 1, a distance of 1180 feet to a point; thence S. 89° 49' 28" W. a distance of 972.5 feet to a point; thence S. 0° 00' 00" W. a distance of 685 feet to a point; thence N. 89° 49' 28" E. a distance of 452.5 feet to a point; thence S. 0° 00' 00" W. a distance of 495 feet to a point; thence N. 89° 49' 28" E. a distance of 520 feet to the point of beginning; containing 21.2 acres, more or less.

NURSERY SITE 601

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 972.5 feet to a point, said point being the point of beginning; thence continuing S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 972.5 feet to a point; thence N. 0° 00' 00" E. a distance of 860 feet to a point; thence N. 89° 49' 28" E. a distance of 972.5 feet to a point; thence S. 0° 00' 00" W. a distance of 860 feet to the point of beginning; containing 19.2 acres, more or less.

NURSERY SITE 602

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 1945 feet to a point, said point being the point of beginning; thence continuing S. 89° 49' 28" W., along the south line of the North Half of the North Half of of the Southeast Quarter of Section 1, a distance of 1695 feet to a point; thence N. 0° 00' 00" E. a distance of 900 feet to a point; thence N. 89° 49' 28" E. a distance of 1115 feet to a point; thence S. 0° 00' 00" W. a distance of 850 feet to a point; thence N. 89° 49' 28" E. a distance of 580 feet to a point; thence S. 0° 00' 00" W. a distance of 50 feet to the point of beginning; containing 23.7 acres, more or less.

ㄫㄑ, 47, 58, 59, 610

EXHIBIT B

TRACT 1:

The North Half of Section 1 and the North Half of the North Half of the South Half of Section 1, Township 1 North, Range 8 East of the Third Principal Meridian, Wayne County, Illinois;

LESS AND EXCEPT that part thereof lying within the following described tracts:

A part of the Northwest Quarter of Section 1, Township 1 North, Range 8 East of the Third Principal Meridian, in Wayne County, Illinois, more particularly described as follows: Commencing at the Northeast corner of said Section 1; thence North 89 degrees 45 minutes 10 seconds West, 2897.43 feet along the North line of Section 1 to the point of beginning; thence North 89 degrees 45 minutes 10 seconds West, 208.88 feet along the North line of Section 1; thence South 0 degrees 43 minutes 05 seconds East, 205.93 feet; thence South 88 degrees 49 minutes 30 seconds East, 199.79 feet; thence North 0 degrees 23 minutes 30 seconds West, 209.04 feet to a point on the North line of Section 1 being the point of beginning, and FURTHER EXCEPT a tract more particularly described as beginning at a point 8 chains East of the Northwest corner of the Northeast Quarter of Section 1, Township 1 North, Range 8 East of the Third Principal Meridian, thence South 4 chains, thence East 2.50 chains, thence North 4 chains, thence West 2.50 chains to the point of beginning;

FURTHER LESS AND EXCEPT that part thereof lying within the following described tracts:

TRACT "A"

#11

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 1945 feet to a point; thence N. 0° 00' 00" E. a distance of 50 feet to a point, said point being the point of beginning; thence continuing N. 0° 00' 00" E. a distance of 850 feet to a point; thence S. 89° 49' 28" W. a distance of 580 feet to a point; thence S. 0° 00' 00" W. a distance of 850 feet to a point; thence N. 89° 49' 28" E. a distance of 580 feet to the point of beginning; containing 11.3 acres, more or less.

TRACT "B"

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 1945 feet to a point; thence N. 0° 00' 00" E. a distance of 860 feet to a point, said point being the point of beginning; thence continuing N. 0° 00' 00" E. a distance of 1220 feet to a point; thence N. 89° 49' 28" E. a distance of 972.5 feet to a point; thence S. 0° 00' 00" W. a distance of 1220 feet to a point; thence S. 89° 49' 28" W. a distance of 972.5 feet to the point of beginning; containing 27.2 acres, more or less.

BAILEY LAKE DESCRIPTION
(INCLUDING DAM AND PUMP HOUSE)

A part of the North Half and a part of the North Half of the North Half of the South Half, all in Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at the northeast corner of said Section 1; thence South, along the east line of Section 1, a distance of 1186.0 feet to a point; thence N. 90° 00' 00" W. a distance of 969.4 feet to a point on the centerline of the dam at the northeasterly corner of the existing lake, said point being the point of beginning; thence N. 52° 28' 54" W. a distance of 441.4 feet to a point; thence N. 70° 34' 26" W. a distance of 105.9 feet to a point; thence N. 63° 31' 27" W. a distance of 727.6 feet to a point; thence S. 27° 32' 16" W., a distance of 48.1 feet to a point on the centerline of the dam at the northwesterly corner of the existing lake; thence going around the existing lake in a counterclockwise direction, to include all of the area below elevation 446.0, to the point of beginning; containing 45.5 acres, more or less.

TRACT "C"
A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence N. 0° 00' 00" E., along the east line of Section 1, a distance of 190 feet to a point, said point being the point of beginning; thence S. 54° 53' 25" W. a distance of 244.5 feet to a point; thence S. 89° 49' 28" W. a distance of 772.5 feet to a point; thence N. 0° 00' 00" E. a distance of 1345 feet to a point; thence N. 89° 49' 28" E. a distance of 452.5 feet to a point; thence S. 0° 00' 00" W. a distance of 495 feet to a point; thence N. 89° 49' 28" E. a distance of 520 feet to a point on the east line of Section 1; thence S. 0° 00' 00" W., along the east line of Section 1, a distance of 710 feet to the point of beginning; containing 23.8 acres, more or less.

B/G/F SITE 202

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence N. 0° 00' 00" E., along the east line of Section 1, a distance of 900 feet to a point, said point being the point of beginning; thence continuing N. 0° 00' 00" E., along the east line of Section 1, a distance of 1180 feet to a point; thence S. 89° 49' 28" W. a distance of 972.5 feet to a point; thence S. 0° 00' 00" W. a distance of 685 feet to a point; thence N. 89° 49' 28" E. a distance of 452.5 feet to a point; thence S. 0° 00' 00" W. a distance of 495 feet to a point; thence N. 89° 49' 28" E. a distance of 520 feet to the point of beginning; containing 21.2 acres, more or less.

NURSERY SITE 601

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 972.5 feet to a point, said point being the point of beginning; thence continuing S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 972.5 feet to a point; thence N. 0° 00' 00" E. a distance of 860 feet to a point; thence N. 89° 49' 28" E. a distance of 972.5 feet to a point; thence S. 0° 00' 00" W. a distance of 860 feet to the point of beginning; containing 19.2 acres, more or less.

NURSERY SITE 602

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 1945 feet to a point, said point being the point of beginning; thence continuing S. 89° 49' 28" W., along the south line of the North Half of the North Half of of the Southeast Quarter of Section 1, a distance of 1695 feet to a point; thence N. 0° 00' 00" E. a distance of 900 feet to a point; thence N. 89° 49' 28" E. a distance of 1115 feet to a point; thence S. 0° 00' 00" W. a distance of 850 feet to a point; thence N. 89° 49' 28" E. a distance of 580 feet to a point; thence S. 0° 00' 00" W. a distance of 50 feet to the point of beginning; containing 23.7 acres, more or less.

<u>TRACT 2</u>: #1

The Northeast Quarter (known as the East Half of Lot 2) of the Northeast Quarter of Section 2, Township 1 North, Range 8 East of the Third Principal Meridian, Wayne County, Illinois.

<u>TRACT 3</u>: #13 + ?

The West Half of the Northeast Quarter of Section 31 and the Northeast Quarter of the Northwest Quarter of Section 32, all in Township 2 North, Range 8 East of the 3rd Principal Meridian, Wayne County, Illinois.

EFFLUENT AGREEMENT

THIS AGREEMENT made effective as of ~~July ___~~ November 15, 1999, by and between ALLIANCE FARMS COOPERATIVE ASSOCIATION, a Colorado cooperative association (referred to herein as "Company"), and DARREN A. BAILEY and ANN HOUT, (referred to herein as "Owner").

WHEREAS, Company owns and operates certain hog operations located on certain real property in Wayne County, Illinois, the legal description of which real property is set forth on Exhibit "A" hereto ("Company's Property");

WHEREAS, Company and Owner desire that effluent produced from Company's hog operations located on Company's Property be applied to certain real property of Owner in Wayne County, Illinois, the legal description of which real property is set forth on Exhibit "B" hereto ("Owner's Property"); and

WHEREAS, Owner is willing to grant a right and license to Company for the purpose of allowing Company to apply effluent to Owner's Property in accordance with the terms and conditions herein contained.

NOW, THEREFORE, in consideration of the mutual covenants contained herein and for Ten Dollars ($10.00) in hand paid by Company to Owner and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Grant of Right and License. Owner hereby grants and conveys to Company, for a period of thirty (30) years from the effective date of this Agreement, the right and license to apply the effluent produced by Company's hog operations located or to be located on Company's Property over and upon Owner's Property, together with all necessary right of ingress and egress over, across and upon Owner's land for that purpose.

2. Effluent. Company shall apply said effluent onto Owner's Property through application equipment provided by Company. Company's provision of effluent to Owner is subject to the prior rights of Bill L. Bailey and Norma Jean Bailey, husband and wife, to receive effluent from Company. To the extent that Company generates effluent from its hog operations on Company's Property that is in excess of the effluent that is applied to Owner's Property in accordance with this Agreement (or if Owner otherwise advises Company that effluent is not to be applied to Owner's Property), Company shall have the right to dispose of such effluent in any manner, including through application upon real property not owned by Owner.

3. Timetable for Application. Unless the parties otherwise agree, effluent will be applied to Owner's Property prior to planting in the spring or after harvest in the fall; provided, however, at least seven (7) days' advance notice is given to Owner. If, in the reasonable judgment of Owner, the effluent application process will damage the soil structure because of inclement

weather, or it is not reasonably practicable to timely incorporate the effluent into the soil due to other good and compelling reasons, Owner shall have the right to defer application of the effluent for up to thirty (30) days after Company's scheduled application date. If Owner does not allow the effluent to be applied to Owner's Property by the expiration of such 30-day period, Company shall have the right to dispose of such effluent in any manner, including through application upon real property not owned by Owner.

4. Soil and Effluent Analysis. Within one month before the effluent application for the fall of 1999, Owner shall submit soil samples of Owner's Property for analysis by one or more agronomists or soil scientists selected by Owner and reasonably acceptable to Company (the "Soil Analyst"), which soil samples shall be obtained at the rate of one sample for each twenty (20) acres of Owner's Property. Before applying effluent to Owner's Property in the fall of 1999, Company shall submit representative samples of the effluent proposed to be applied to Owner's Property to one or more agronomists or soil scientists selected by Company (the "Effluent Analyst") for analysis. After these initial soil and effluent analyses, during the term of this Agreement soil samples shall be analyzed by Soil Analyst once every two years and effluent samples shall be analyzed by Effluent Analyst before each application. Prior to the application of effluent to Owner's Property, Owner shall cause a copy of the Soil Analyst's analysis to be furnished to Company and Company shall cause a copy of the Effluent Analyst's analysis to be furnished to Owner. Company shall not apply effluent to Owner's Property at a rate in excess of any agronomic rate recommendations of a soil science educator with the University of Illinois Extension, College of Agriculture, University of Illinois at Urbana-Champaign. Company shall pay all charges of the Effluent Analyst for the effluent analysis, and Owner shall pay all charges of the Soil Analyst for the soil analysis and recommendations.

5. Compliance with Law. Company and Owner each shall use their respective best efforts to comply with all federal, state and local environmental laws (to the extent such laws are applicable to the respective party), including, but not limited to, all laws and regulations of the Federal Environmental Protection Agency and the Illinois Environmental Protection Agency, the Livestock Management Facilities Act, 510 ILCS 77/1 et seq. and any rules and regulations promulgated by the Illinois Department of Agriculture regarding the design criteria for field application of livestock waste and the application and incorporation of animal waste. Company shall be responsible for complying with all licensing requirements, if any, promulgated by the aforesaid authorities.

6. Indemnity. Company agrees to indemnify and hold harmless Owner against all adverse claims, suits, administrative penalties, judgments, decrees, costs, expenses, including Owner's reasonable attorney fees, or other monetary loss, including those resulting from damage to property, which, in any such case, is caused by Company's application of effluent to Owner's Property in violation of Section 5 above, except to the extent caused by Owner.

7. No Monetary Payments. No monetary payments are to be made by either party to the other under this Agreement for the application of effluent to Owner's Property or for the right

and license granted to Company under this Agreement. Owner acknowledges that Owner shall receive adequate consideration for the right and license granted hereby in the form of the anticipated increased soil enrichment and fertility of Owner's Property realized from the application of effluent and the resulting anticipated increase in crop yields that may be produced on Owner's Property. There shall be no failure of consideration if the yields do not increase or soil enrichment does not occur because the parties understand it is difficult, if not impossible, to predict with any degree of accuracy any increases in the crop production or improvement in soil enrichment.

8. Application Equipment. The application equipment and labor required to apply the effluent onto Owner's Property shall be provided by, and at the expense of, Company, and such equipment shall remain the property of Company. When not in use, such equipment shall not be stored on Owner's Property. Company is granted the right and license to enter onto Owner's Property for inspection prior to application of effluent, as well as for purposes of actually applying the effluent.

9. Arbitration. In the event of any controversy arising out of or relating to this Agreement, or any breach hereof, the dispute shall be submitted to binding arbitration in accordance with the rules of the Uniform Arbitration Act and conducted in the Wayne County, Illinois. Such arbitration shall be initiated by either party by notifying the other party in writing and by requesting the American Arbitration Association to select a panel of five (5) arbitrators, which arbitrators shall consist of persons who are knowledgeable in agronomy, soil science, livestock production or other disciplines (depending on the matter in controversy) and may include an extension educator with the University of Illinois Extension, College of Agriculture, University of Illinois at Urbana-Champaign. Alternate strikes shall be made to the panel commencing with the party requesting the arbitration until one name remains. Such individual shall be the arbitrator for the controversy. The party requesting the arbitration shall notify the arbitrator, who shall hold a hearing(s) within thirty (30) days of the notice. The arbitrator shall render a decision within twenty (20) days after the conclusion of the hearing(s). Judgment upon the award rendered by the arbitrator may be entered in any court having jurisdiction thereof. All costs and fees for such arbitration will be divided equally between the parties. During any dispute under this Agreement, Owner and Company shall continue to fulfill their respective obligations under this Agreement, unless the subject matter of the dispute is of such a nature that this is by no means possible until the dispute has been finally resolved.

10. Notices. Any notice provided for or concerning this Agreement shall be deemed sufficiently given when sent by certified or registered mail addressed as follows:

If to Owner: Darren A. Bailey
R. R. 1
Box 89
Xenia, IL 62899

If to Company: Alliance Farms Cooperative Association
c/o Farmland Foods
10150 N. Executive Hills Blvd.
Kansas City, MO 64153
Attn: Wayne N. Snyder

or to such other address or person as a party may designate as its notice address by written notice to the other party given in accordance with this Section. Owner hereby appoints Darren A. Bailey, to be the true and lawful attorney of Owner for all matters in connection with this Agreement, including the compromise or resolution of any dispute between the parties relating to this Agreement.

11. Governing Law. It is agreed that this Agreement shall be governed by, construed, and enforced in accordance with the laws of the State of Illinois.

12. Recording. This Agreement shall be recorded in the real estate records of Wayne County, Illinois, and the terms hereof shall be binding on the heirs, personal representatives, successors, and permitted assigns of each of the parties hereto. Company shall not make any assignment of this Agreement without first obtaining the written consent of Owner, which consent will not unreasonably be withheld.

13. Entire Agreement; Amendment. This Agreement shall constitute the entire agreement of the parties with respect to the subject matter hereof, and any oral or written agreement, understanding or representations made prior to the date of this Agreement and concerning the subject matter of this Agreement shall not be binding upon any party hereto except to the extent incorporated in this Agreement. Any changes, modifications, adjustments or amendments to this Agreement must be in writing, signed by each party.

14. Relationship. It is understood that nothing contained in this Agreement shall be considered as creating an employer-employee relationship, a partnership, or a joint venture between the parties hereto.

15. Termination upon Violation. In the event Company disposes of effluent on Owner's Property in violation of Sections 4 and 5 above, the right and license granted hereunder shall be subject to revocation upon the provision by Owner to Company of thirty (30) days' notice to that effect and thereupon this Agreement shall be of no further force and effect.

16. Conveyance of Owner's Property. Any person or entity acquiring any right, title or interest in all or any portion of Owner's Property during the term of this Agreement shall take subject to the terms hereof. If Owner sells or conveys all or any portion of Owner's Property during the term of this Agreement, Owner shall provide any subsequent holder of an interest in Owner's Property with notice of this Agreement prior to sale or conveyance and shall obtain the

agreement of such subsequent holder to be bound by the terms hereof (which agreement shall be on terms reasonably acceptable to Company).

17. Headings. The headings of the sections of this Agreement are solely for the convenience and reference of the parties and shall not be used to explain, modify, simplify, or aid in the interpretation of the provisions of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

OWNER:

ANN HOUT

DARREN A. BAILEY

COMPANY:

ALLIANCE FARMS COOPERATIVE ASSOCIATION, a Colorado cooperative association

By: ______________________

STATE OF ILLINOIS)
) ss:
COUNTY OF WAYNE)

The foregoing instrument was acknowledged before me on this 6 day of ~~June~~ July, 1999 by ANN HOUT. Witness my hand and notarial seal the day and year in this certificate above written.

(SEAL)

Name: Kasey B. Austin
Notary Public

My commission expires: 6-17-2002

OFFICIAL SEAL
KASEY B. AUSTIN
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 6-17-2002

STATE OF ILLINOIS)
) ss:
COUNTY OF WAYNE)

The foregoing instrument was acknowledged before me on this 6 day of ~~June~~ July, 1999 by DARREN A. BAILEY. Witness my hand and notarial seal the day and year in this certificate above written.

(SEAL)

Name: Kasey B. Austin
Notary Public

My commission expires: 6-17-2002

OFFICIAL SEAL
KASEY B. AUSTIN
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPI...

STATE OF Missouri)
) ss:
COUNTY OF Platte)

The foregoing instrument was acknowledged before me on this 15th day of ~~June~~ November, 1999 by WAYNE N. SNYDER as President of Alliance Farms Cooperative Association, a Colorado cooperative association. Witness my hand and notarial seal the day and year in this certificate above written.

(SEAL)

Name: DeLonna Wise
Notary Public

My commission expires: 4-11-2003

DeLonna Wise, Notary Public
Platte County, State of Missouri
My Commission Expires 4/11/2003

EXHIBIT A

Company's Property

B/G/F SITES 201& 203

A part of Section 36, Township 2 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at the southeast corner of said Section 36; thence N. 0° 38' 26" W., along the east line of Section 36, a distance of 1199.3 feet to the point of beginning; thence S. 89° 21' 34" W. a distance of 600 feet to a point; thence N. 0° 38' 26" W. a distance of 95 feet to a point; thence S. 89° 21' 34" W. a distance of 730 feet to a point; thence N. 0° 38' 26" W. a distance of 635 feet to a point; thence N. 89° 21' 34" E. a distance of 310 feet to a point; thence N. 0° 38' 26" W. a distance of 1070 feet to a point; thence N. 89° 21' 34" E. a distance of 580 feet to a point; thence S. 0° 38' 26" E. a distance of 312 feet to a point; thence N. 89° 21' 34" E. a distance of 340 feet to a point; thence N. 0° 38' 26" W. a distance of 540 feet to a point; thence N. 89° 21' 34" E. a distance of 100 feet to a point on the east line of Section 36; thence S. 0° 38' 26" E., along the east line of Section 1, a distance of 2028 feet to the point of beginning; containing 43.8 acres, more or less.

B/G/F SITE 202

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence N. 0° 00' 00" E., along the east line of Section 1, a distance of 900 feet to a point, said point being the point of beginning; thence continuing N. 0° 00' 00" E., along the east line of Section 1, a distance of 1180 feet to a point; thence S. 89° 49' 28" W. a distance of 972.5 feet to a point; thence S. 0° 00' 00" W. a distance of 685 feet to a point; thence N. 89° 49' 28" E. a distance of 452.5 feet to a point; thence S. 0° 00' 00" W. a distance of 495 feet to a point; thence N. 89° 49' 28" E. a distance of 520 feet to the point of beginning; containing 21.2 acres, more or less.

NURSERY SITE 601

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 972.5 feet to a point, said point being the point of beginning; thence continuing S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 972.5 feet to a point; thence N. 0° 00' 00" E. a distance of 860 feet to a point; thence N. 89° 49' 28" E. a distance of 972.5 feet to a point; thence S. 0° 00' 00" W. a distance of 860 feet to the point of beginning; containing 19.2 acres, more or less.

NURSERY SITE 602

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 1945 feet to a point, said point being the point of beginning; thence continuing S. 89° 49' 28" W., along the south line of the North Half of the North Half of of the Southeast Quarter of Section 1, a distance of 1695 feet to a point; thence N. 0° 00' 00" E. a distance of 900 feet to a point; thence N. 89° 49' 28" E. a distance of 1115 feet to a point; thence S. 0° 00' 00" W. a distance of 850 feet to a point; thence N. 89° 49' 28" E. a distance of 580 feet to a point; thence S. 0° 00' 00" W. a distance of 50 feet to the point of beginning; containing 23.7 acres, more or less.

EXHIBIT B

Owner's Property

TRACT "A"

#11

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 1945 feet to a point; thence N. 0° 00' 00" E. a distance of 50 feet to a point, said point being the point of beginning; thence continuing N. 0° 00' 00" E. a distance of 850 feet to a point; thence S. 89° 49' 28" W. a distance of 580 feet to a point; thence S. 0° 00' 00" W. a distance of 850 feet to a point; thence N. 89° 49' 28" E. a distance of 580 feet to the point of beginning; containing 11.3 acres, more or less.

TRACT "B"

#12

A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence S. 89° 49' 28" W., along the south line of the North Half of the North Half of the Southeast Quarter of Section 1, a distance of 1945 feet to a point; thence N. 0° 00' 00" E. a distance of 860 feet to a point, said point being the point of beginning; thence continuing N. 0° 00' 00" E. a distance of 1220 feet to a point; thence N. 89° 49' 28" E. a distance of 972.5 feet to a point; thence S. 0° 00' 00" W. a distance of 1220 feet to a point; thence S. 89° 49' 28" W. a distance of 972.5 feet to the point of beginning; containing 27.2 acres, more or less.

LESS AND EXCEPT that part thereof lying within the following described tract:

BAILEY LAKE DESCRIPTION
(INCLUDING DAM AND PUMP HOUSE)

A part of the North Half and a part of the North Half of the North Half of the South Half, all in Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at the northeast corner of said Section 1; thence South, along the east line of Section 1, a distance of 1186.0 feet to a point; thence N. 90° 00' 00" W. a distance of 969.4 feet to a point on the centerline of the dam at the northeasterly corner of the existing lake, said point being the point of beginning; thence N. 52° 28' 54" W. a distance of 441.4 feet to a point; thence N. 70° 34' 26" W. a distance of 105.9 feet to a point; thence N. 63° 31' 27" W. a distance of 727.6 feet to a point; thence S. 27° 32' 16" W., a distance of 48.1 feet to a point on the centerline of the dam at the northwesterly corner of the existing lake; thence going around the existing lake in a counterclockwise direction, to include all of the area below elevation 446.0, to the point of beginning; containing 45.5 acres, more or less.

TRACT "C"
A part of Section 1, Township 1 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at an iron pin found at the southeast corner of the North Half of the North Half of the Southeast Quarter of said Section 1; thence N. 0° 00' 00" E., along the east line of Section 1, a distance of 190 feet to a point, said point being the point of beginning; thence S. 54° 53' 25" W. a distance of 244.5 feet to a point; thence S. 89° 49' 28" W. a distance of 772.5 feet to a point; thence N. 0° 00' 00" E. a distance of 1345 feet to a point; thence N. 89° 49' 28" E. a distance of 452.5 feet to a point; thence S. 0° 00' 00" W. a distance of 495 feet to a point; thence N. 89° 49' 28" E. a distance of 520 feet to a point on the east line of Section 1; thence S. 0° 00' 00" W., along the east line of Section 1, a distance of 710 feet to the point of beginning; containing 23.8 acres, more or less. #12

TRACT "D"
A part of Section 36, Township 2 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: The South 31.66 acres of the Northeast Quarter of the Southwest Quarter of said Section 36; Also, the South Half of the South Half of Section 36; Also the South Half of the Northeast Quarter of Section 36; Also, the North Half of the Southeast Quarter of Section 36; #2, #3, #4, #5, #21, #22 + ? 23
Excepting therefrom, the following: A part of Section 36, Township 2 North, Range 8 East, 3rd Principal Meridian, Wayne County, Illinois and being further described as follows: Commencing at the southeast corner of said Section 36; thence N. 0° 38' 26" W., along the east line of Section 36, a distance of 1199.3 feet to the point of beginning; thence S. 89° 21' 34" W. a distance of 600 feet to a point; thence N. 0° 38' 26" W. a distance of 95 feet to a point; thence S. 89° 21' 34" W. a distance of 730 feet to a point; thence N. 0° 38' 26" W. a distance of 635 feet to a point; thence N. 89° 21' 34" E. a distance of 310 feet to a point; thence N. 0° 38' 26" W. a distance of 1070 feet to a point; thence N. 89° 21' 34" E. a distance of 580 feet to a point; thence S. 0° 38' 26" E. a distance of 312 feet to a point; thence N. 89° 21' 34" E. a distance of 340 feet to a point; thence N. 0° 38' 26" W. a distance of 540 feet to a point; thence N. 89° 21' 34" E. a distance of 100 feet to a point on the east line of Section 36; thence S. 0° 38' 26" E., along the east line of Section 1, a distance of 2028 feet to the point of beginning.

NUTRIENT EASEMENT

THIS EASEMENT ("Easement") is made between Mark Shan, Matthew Shan, Steve Shan and Mark and Steve Shan Farms, Inc. ("Landlord"), whose address for the purposes of this Easement is 3018 N. Jesse Road, Noble, IL 62868 and Murphy Farms LLC ("Nutrient Owner") whose address for the purpose of this Easement is 2059 Co Rd 2400E, Mt. Erie, IL 62446.

THE PARTIES AGREE AS FOLLOWS:

I. PREMISES. Landlord grants to Nutrient Owner an easement for the application of nutrients on the following real estate situated in Wayne County, Illinois (the "Real Estate"): Various parcels located in Elm River (T-1-N, R-8-E) and Mt. Erie (T-1-N, R-9-E), and Mt. Erie N (T-2-N, R-9-E) townships in Wayne County, Illinois,

and containing 783 acres, more or less. Actual acres and rate of application upon acres included in this tract will be identified in the current nutrient management plan.

2. PURPOSE AND USE. This easement is for the sole purpose of manure management and disposal of animal manure. Nutrient Owner shall be allowed to spread and dispose of animal manure on property owned by Landlord above described at such regular intervals as is necessary for Nutrient Owner. Disposal and distribution of animal manure, however, shall not interfere with the productivity, growing and harvesting of crops on the above described premises. Nutrient Owner further agrees to comply with all environmental laws in the disposal of such animal manure both, state and federal. Nutrient Owner further agrees to prevent all nuisances that may be created by such disposal and handling of animal manure.

3. TERM OF EASEMENT. The term shall commence on 1st day of December, 2013. The term shall be for a period of one (1) year. The easement shall automatically renew upon expiration from year-to-year, upon the same terms and conditions unless either party gives written notice to the other prior to November 1, of any lease year of an election not to renew this Easement.

4. COMPLIANCE WITH LAW. Nutrient Owner shall use its best efforts to comply with all federal, state, and local environmental laws (to the extent such laws are applicable to

the respective party), including, but no limited to, all laws and regulations of the Federal Environmental Protection Agency and the Illinois Environmental Protection Agency, the Livestock Management Facilities Act, 510 ILCS 77/1 et seq. and any rules and regulation promulgated by the Illinois Department of Agriculture regarding the design criteria for field application of livestock waste and the application and incorporation of animal waste.

5. INDEMNITY. Nutrient Owner and Landlord acknowledge that the effluent to be applied by Nutrient Owner on Landlord's land is composed of waste matter. Nutrient Owner agrees to adhere to the procedures concerning application of the Nutrient Owner's effluent required pursuant to the Requirements. Nutrient Owner shall indemnify Landlord against all actions, claims, demands, liabilities, and damages, including reasonable attorney fees, that may be imposed on or incurred by Landlord as a consequence of any failure on the part of Nutrient Owner, or its officers, agents or employees, to adhere to those procedure in connections with the application of Nutrient Owner's effluent on Landlord's land. Nutrient Owner shall also indemnify and hold Landlord harmless against all actions, claims, demands, liabilities, and damages, including reasonable attorney fees, that may be imposed on or incurred by Landlord as a consequence of negligent acts, omissions or other misconduct by employees, agents, officers or directors of Nutrient Owner, and for actions, claims, demands, liabilities, and damages, including reasonable attorney fees, in connection with products placed upon Landlord’s land. No other indemnity, express or implied, is intended by this Agreement.

6. VIOLATION OF TERMS OF EASEMENT. If Nutrient Owner or Landlord violates the terms of this Easement, the other shall have the right to pursue the legal and equitable remedies to which it is entitled.

7. ASSIGNMENT. This Easement may be assigned by either party or by its legal representatives, successors in interest or assigns.

8. ATTORNEY FEES AND COURT COSTS. If either party files suit to enforce any of the terms of this Easement, the prevailing party shall be entitled to recover court costs and reasonable attorneys' fees.

9. CHANGE IN EASEMENT TERMS. The conduct of either party, be act or omission, shall not be construed as a material

alteration of this Easement until such provision is reduced to writing and executed by both parties as addendum to this.

10. CONSTRUCTION. Words and phrases herein, including the acknowledgment, are construed as in the singular or plural and as the appropriate gender, according to the context.

11. NOTICES. The notices contemplated in this Easement shall be made in writing and shall either be delivered in person, or be mailed in the U.S. Main, registered mail, return receipt requested, to the recipient's last known mailing address.

12. SUCCESSORS and ASSIGNS bound; NUMBER; GENDER; AGENTS; CAPTIONS. The rights, covenants and agreements contained herein shall be binding upon and inure to the benefit of the respective legal representatives, successors and assigns or the parties. Words and phrases contained herein, including acknowledgment hereof, shall be construed as in the singular or plural number, and as masculine, feminine or neuter gender according to the contexts. The captions and headings of the paragraph of this Agreement are for convenience only and are not to be used to interpret or define the provision hereof.

13. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the laws of the State of Illinois.

14. ADDITIONAL PROVISIONS.

DATED: 5-14-14

NUTRIENT OWNER: Cory Nelson

LANDLORD:

Mark Shan

Matthew Shan

Steve Shan

Mark and Steve Shan Farms, Inc.
By: ______________________
Mark Shan, President

NUTRIENT EASEMENT

THIS EASEMENT ("Easement") is made between Gary Eckel ____________________ ("Landlord"), whose address for the purpose of this Easement is 4796 N. Elk Grove Rd Noble, IL 62868
and __Murphy Farms of Illinois LLC ("Nutrient Owner") whose address for the purpose of this Easement is Rt. 1 Box 29 Mt. Erie, IL 62446 ________

THE PARTIES AGREE AS FOLLOWS:

1. PREMISES. Landlord grants to Nutrient Owner an easement for the application of nutrients on the following real estate situated in ____Wayne____ County, Illinois (the "Real Estate"): Approximately 519 acres located in the south half of Section 31 & 32 of T-2-N, R-9-E, and in the north half of the north half of Section5&6 of T-1-N, R-9-E- Mt. Erie Township.

and containing _____519________ acres, more or less. Actual acres and rate of application upon acres included in this tract will be identified in the current nutrient management plan

2. PURPOSE AND USE. This easement is for the sole purpose of manure management and disposal of animal manure. Nutrient Owner shall be allowed to spread and dispose of animal manure on property owned by Landlord above described at such regular intervals as is necessary for Nutrient Owner. Disposal and distribution of animal manure, however, shall not interfere with the productivity, growing and harvesting of crops on the above described premises. Nutrient Owner further agrees to comply with all environmental laws in the disposal of such animal manure both, state and federal. Nutrient Owner further agrees to prevent all nuisances that may be created by such disposal and handling of animal manure.

3. TERM OF EASEMENT. The term shall commence on __15th day of April, 2013 . The term shall be for a period of one (1) year. The Easement shall automatically renew upon expiration from year-to-year, upon the same terms and conditions unless either party gives due and timely written notice to the other of an election not to renew this Easement.

4. VIOLATION OF TERMS OF EASEMENT. If Tenant or Landlord violates the terms of this Easement, the other shall have the right to pursue the legal and equitable remedies to which it is entitled.

5. ASSIGNMENT. This Easement may be assigned by either party or by its legal representatives, successors in interest or assigns.

6. ATTORNEY FEES AND COURT COSTS. If either party files suit to enforce any of the terms of this Easement, the prevailing party shall be entitled to recover court costs and reasonable attorneys' fees.

7. CHANGE IN EASEMENT TERMS. The conduct of either party, by act or omission, shall not be construed as a material alteration of this Easement until such provision is reduced to writing and executed by both parties as addendum to this .

8. CONSTRUCTION. Words and phrases herein, including the acknowledgment, are construed as in the singular or plural and as the appropriate gender, according to the context.

9. NOTICES. The notices contemplated in this Easement shall be made in writing and shall either be delivered in person, or be mailed in the U.S. mail, registered mail, return receipt requested, to the recipient's last known mailing address.

10. SUCCESSORS and ASSIGNS bound; NUMBER; GENDER; AGENTS; CAPTIONS. The rights, covenants and agreements contained herein shall be binding upon and inure to the benefit of the respective legal representatives, successors and assigns of the parties. Words and phrases contained herein, including acknowledgment hereof, shall be construed as in the singular or plural number, and as masculine, feminine or neuter gender according to the contexts. The captions and headings of the paragraphs of this Agreement are for convenience only and are not to be used to interpret or define the provisions hereof.

11. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the laws of the State of Illinois.

12. ADDITIONAL PROVISIONS.

DATED: 10-18-13

NUTRIENT OWNER

Cory Nelson

Murphy Brown LLC

LANDLORD:

Gary E. [illegible]

NUTRIENT EASEMENT

THIS EASEMENT ("Easement") is made between Brad Atteberry ("Landlord"), whose address for the purpose of this Easement is 1905 Co Rd 2400E Mt. Erie, IL 62446 and Murphy Farms of Illinois LLC ("Nutrient Owner") whose address for the purpose of this Easement is Rt. 1 Box 29 Mt. Erie, IL 62446

THE PARTIES AGREE AS FOLLOWS:

1. PREMISES. Landlord grants to Nutrient Owner an easement for the application of nutrients on the following real estate situated in Wayne County, Illinois (the "Real Estate"): Approximately 192 acres located in the NW ¼ of Section 36 and the NW1/4 of the SW1/4 of Section 36, T-2-N, R-8-E, Zif Township.

and containing 192 acres, more or less. Actual acres and rate of application upon acres included in this tract will be identified in the current nutrient management plan

2. PURPOSE AND USE. This easement is for the sole purpose of manure management and disposal of animal manure. Nutrient Owner shall be allowed to spread and dispose of animal manure on property owned by Landlord above described at such regular intervals as is necessary for Nutrient Owner. Disposal and distribution of animal manure, however, shall not interfere with the productivity, growing and harvesting of crops on the above described premises. Nutrient Owner further agrees to comply with all environmental laws in the disposal of such animal manure both, state and federal. Nutrient Owner further agrees to prevent all nuisances that may be created by such disposal and handling of animal manure.

3. TERM OF EASEMENT. The term shall commence on 15th day of April, 2013. The term shall be for a period of one (1) year. The Easement shall automatically renew upon expiration from year-to-year, upon the same terms and conditions unless either party gives due and timely written notice to the other of an election not to renew this Easement.

4. VIOLATION OF TERMS OF EASEMENT. If Tenant or Landlord violates the terms of this Easement, the other shall have the right to pursue the legal and equitable remedies to which it is entitled.

5. ASSIGNMENT. This Easement may be assigned by either party or by its legal representatives, successors in interest or assigns.

6. ATTORNEY FEES AND COURT COSTS. If either party files suit to enforce any of the terms of this Easement, the prevailing party shall be entitled to recover court costs and reasonable attorneys' fees.

7. CHANGE IN EASEMENT TERMS. The conduct of either party, by act or omission, shall not be construed as a material alteration of this Easement until such provision is reduced to writing and executed by both parties as addendum to this .

8. CONSTRUCTION. Words and phrases herein, including the acknowledgment, are construed as in the singular or plural and as the appropriate gender, according to the context.

9. NOTICES. The notices contemplated in this Easement shall be made in writing and shall either be delivered in person, or be mailed in the U.S. mail, registered mail, return receipt requested, to the recipient's last known mailing address.

10. SUCCESSORS and ASSIGNS bound; NUMBER; GENDER; AGENTS; CAPTIONS. The rights, covenants and agreements contained herein shall be binding upon and inure to the benefit of the respective legal representatives, successors and assigns of the parties. Words and phrases contained herein, including acknowledgment hereof, shall be construed as in the singular or plural number, and as masculine, feminine or neuter gender according to the contexts. The captions and headings of the paragraphs of this Agreement are for convenience only and are not to be used to interpret or define the provisions hereof.

11. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the laws of the State of Illinois.

12. ADDITIONAL PROVISIONS.

DATED: 4-24-2013

NUTRIENT OWNER

Cory Nelson

Murphy Brown LLC

LANDLORD:

Brad Atteberry

NUTRIENT EASEMENT

THIS EASEMENT ("Easement") is made between Ken Hohlbaugh ("Landlord"), whose address for the purpose of this Easement is Rt 1 P.O. Box 37, Mt. Erie, IL 62446 and Murphy Farms of IL, LLC ("Nutrient Owner") whose address for the purpose of this Easement is Rt. 1 Box 29 Mt. Erie, IL 62446

THE PARTIES AGREE AS FOLLOWS:

1. PREMISES. Landlord grants to Nutrient Owner an easement for the application of nutrients on the following real estate situated in Wayne County, Illinois (the "Real Estate"):
The SE ¼ of the NE ¼ section 2 and the N1/2 of the NE1/4 of the SE ¼ section 2 T-1-N, R-8-E (Elm River township).

and containing 60 acres, more or less. Actual acres and rate of application upon acres included in this tract will be identified in the current nutrient management plan

2. PURPOSE AND USE. This easement is for the sole purpose of manure management and disposal of animal manure. Nutrient Owner shall be allowed to spread and dispose of animal manure on property owned by Landlord above described at such regular intervals as is necessary for Nutrient Owner. Disposal and distribution of animal manure, however, shall not interfere with the productivity, growing and harvesting of crops on the above described premises. Nutrient Owner further agrees to comply with all environmental laws in the disposal of such animal manure both, state and federal. Nutrient Owner further agrees to prevent all nuisances that may be created by such disposal and handling of animal manure.

3. TERM OF EASEMENT. The term shall commence on 28 day of February, 2013. The term shall be for a period of one (1) year. The Easement shall automatically renew upon expiration from year-to-year, upon the same terms and conditions unless either party gives due and timely written notice to the other of an election not to renew this Easement.

4. VIOLATION OF TERMS OF EASEMENT. If Tenant or Landlord violates the terms of this Easement, the other shall have the right to pursue the legal and equitable remedies to which it is entitled.

5. ASSIGNMENT. This Easement may be assigned by either party or by its legal representatives, successors in interest or assigns.

6. ATTORNEY FEES AND COURT COSTS. If either party files suit to enforce any of the terms of this Easement, the prevailing party shall be entitled to recover court costs and reasonable attorneys' fees.

7. CHANGE IN EASEMENT TERMS. The conduct of either party, by act or omission, shall not be construed as a material alteration of this Easement until such provision is reduced to writing and executed by both parties as addendum to this .

8. CONSTRUCTION. Words and phrases herein, including the acknowledgment, are construed as in the singular or plural and as the appropriate gender, according to the context.

9. NOTICES. The notices contemplated in this Easement shall be made in writing and shall either be delivered in person, or be mailed in the U.S. mail, registered mail, return receipt requested, to the recipient's last known mailing address.

10. SUCCESSORS and ASSIGNS bound; NUMBER; GENDER; AGENTS; CAPTIONS. The rights, covenants and agreements contained herein shall be binding upon and inure to the benefit of the respective legal representatives, successors and assigns of the parties. Words and phrases contained herein, including acknowledgment hereof, shall be construed as in the singular or plural number, and as masculine, feminine or neuter gender according to the contexts. The captions and headings of the paragraphs of this Agreement are for convenience only and are not to be used to interpret or define the provisions hereof.

11. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the laws of the State of Illinois.

12. ADDITIONAL PROVISIONS.

DATED: 10-18-13

NUTRIENT OWNER

Conley Nelson

Murphy Brown LLC

LANDLORD:

6.11. Provisions for Waste Application

All fields upon which waste will be applied are operated by Murphy Brown, L.L.C. or upon fields for which a manure spreading agreement has been obtained. A listing of the fields is attached with the application rate calculations for each source type. No manure will be applied on fields unless the soil phosphorus test (Bray 1 or Mehlich-3) is 300 lb/acre or less.

The provisions of 35 IAC 506.303 (o) through (u) shall be met or exceeded when applying waste. These restrictions are identified on the attached aerial photos or other field maps in appendix A.

o) Waste applied within 1320' of any residence not owned by Murphy Brown shall be injected or incorporated on the day of application.

p) Waste shall not be applied within:
   1. 200' of surface water unless the water is up-gradient or there is adequate diking to prevent runoff, and
   2. 150' of a potable water supply well.

q) Waste shall not be applied in a 10-year flood plain unless the injection or incorporation method of application is used.

r) Livestock waste shall not be applied in waterways.

s) Waste that is spread on frozen or snow-covered land shall be limited to areas which:
   1. Land slope is 5% or less, or
   2. Adequate erosion control practices exist

t) The certified livestock manager shall inspect all berm tops, exterior sides, non-submerged interior sides for evidence of erosion, burrowing animal activity, and other indications of berm degradation at least every two weeks and keep a record of inspections.

u) Livestock waste shall not be applied during a rainfall or to saturated soil and conservative application rates shall be used in the case of a high water table or shallow earth cover to fractured bedrock. Caution shall be exercised in applying livestock waste, particularly on porous soils, so as not to cause contamination of the groundwater.

Facility management and employees or professional waste applicators retained shall handle all wastes. All land application of waste shall be performed in a manner that prevents runoff and odor and in accordance with all applicable regulations and NPDES Permit (if applicable).

6.12. Manure Application Recommendations

1) Observe all setback application distances.
   a) Inject or incorporate within 24 hrs, manure applied within 1/4 mile of any residence.
   b) Do not apply manure within 150' of any well.
   c) Do not apply manure within 200' of undiked and/or down gradient surface water.
   d) Manure applied in a 10-year flood plain must be injected or incorporated.
   e) Manure may not be applied in waterways.
2) Use good neighbor policies when applying manure.
3) Define a spill contingency plan.

4) Do not apply manure to frozen soil.
5) Avoid manure application to saturated soils.
6) Use subsurface or incorporation application equipment when possible.
7) Use flow-meter equipped pumping equipment.
8) Apply manure uniformly with calibrated application equipment.
9) Use proper rate planning protocols.
10) Use nitrification inhibitors for all summer and fall applications.
11) Reduce chemical fertilizer by corresponding manure nutrient amounts.
12) Use realistic yield goals and **Do Not** over apply manure.
13) Rotate fields and application starting points within those fields.
14) Require all custom operators follow the above protocols.
15) Never leave application equipment and supply lines unattended.

6.13. Provisions for Manure Testing

If results of an analysis performed on samples of waste are used for the nutrient values in a plan, the following procedures shall be followed:

1) The livestock waste handling facility owner or operator shall annually obtain a laboratory analysis of the nutrient content of the livestock waste to be applied to land as provided within the waste management plan. Livestock waste shall be sampled during the application process. Multiple subsamples shall be obtained and may be combined into one sample for analysis so that a representative sample is used for preparation of the waste management plan. A sample taken during waste application the previous year can be used as a representative sample of the waste to be applied the following year unless there has been a change in the waste management practices.

2) Livestock waste sampling shall be performed under the direction of a certified livestock manager to ensure a representative sample from the livestock waste storage facility and to preserve the integrity of the sample.

3) The laboratory analysis of the livestock waste sample shall include, but not be limited to, total nitrogen, ammonium nitrogen, total phosphorous, and total potassium. Results of the analysis shall be included in the waste management plan.

Section 7. FEED MANAGEMENT

Section 8. Other Utilization

Section 9. Recordkeeping

Waste Application Records

Records of waste application shall be kept and include all of the information on the attached forms including:

1. Field I.D.
2. Date of application
3. Waste source and type
4. Method of application
5. Application rate
6. Total acres applied to
7. Total amount of waste applied
8. Important notes or comments
9. Identification of application areas on field maps.

Manure Application Equipment and Practices

Applicator Name (self/custom)	Borgic Custom Pumping (custom)
Custom Applicator Name	Neil Borgic
Address	2023 N 1600th Street
City, State, Zip	West Liberty, IL 62475
Phone #	618-553-5666
Agitation equipment	Houle Prop Pump
Transport equipment	Drag Hose - Houle tank with shank injection
Incorporation equipment	Aerway, Shank toolbar & field cultivator
Irrigation equipment	None
Odor abatement practices	Injection & Incorporation
Crop Fertility Advisor	
Phone #	

Record Keeping and Testing

1.) Obtain composite manure samples and test prior to all application events.
**If manure testing is mandated to point of application; use these sampling suggestions:
   1. Irrigation applications should be collected within the application area several times during the application event. These samples should be combined, mixed and tested as representative of the containment.
   2. Tank applied manure should be sampled several times during the hauling event and combined as a representative sample of the containment.
   3. Dry box applied manure should be sampled by placing a clean 8' by 8' section of visqueen in the path of the spreader. Collect the discharged manure and mix together for a representative sample of the manure mass.

2.) Request a full nutrient profile on all manure samples.
3.) Test soils every three years -- (annually is optimum)
4.) Maintain field maps to scale for all application sites.
5.) Keep daily application logs of all application events.
6.) Monitor and record weather conditions during application events.
7.) Maintain soil and cropping records for each field manure is applied to.
8.) Secure landowner agreements for all non-owned application sites.
9.) Record final application event information.
10.) Supply landowners and farming tenants with application summaries.
11.) Use pre side-dress nitrate testing to verify plant available nitrogen.

Require custom applicators adhere to the above protocols

Containment Inspection and Maintenance Protocols

Annual Check List

1. Maintain all pumps and motors per manufacturer recommendations
2. Check all hoses and lines for leaks and excessive wear
3. Clean all sumps and settling tanks and remove debris
4. Service all application equipment and inspect for wear
5. Review all records and reports; update as needed
6. Plan next years application windows

Weekly Check List

1. Inspect all building foundations for leaks and cracks
2. Inspect all earthen dikes for channeling and seepage
3. Eliminate all rodent activity from buildings and containments
4. Remove or spray all weeds and shrub trees from dikes and perimeters
5. Assure good vegetative cover on dike slopes and tops and mow as needed
6. Be sure all pump-out covers are in place
7. Assure all containments have freeboard space available
8. Clean and check all manure transfer pumps and recycle lines
9. Clean and check all separation equipment
10. Be sure all security covers and fences are in place
11. Maintain all warning placards
12. Review all spill contingency plans
13. Check location and readiness of all spill recovery equipment
14. Check condition of all surface water diversion structures
15. Repair and report on all incidents of deterioration

Section 10. References

Section 11. Updates/Amendments

11.1. Updates

NMP – CNMP Review Record

The Nutrient Management Plan should be reviewed at a minimum of once per year and records of that review need to be kept.

The annual review should include updating soil samples, updating manure samples, and reviewing application rates and cropping practices.

Date	Updates Made	Reviewer
3-31-2015	Manure tests, CY2015 application rate	GCB
4-22-2016	Manure tests, CY2016 application rate	GCB
4-12-2017	Manure tests, CY2017 application rate	GCB
10-17-2017	Manure tests, CY2018 application rate	GCB
6-15-2018	Manure tests, CY2018 application rate	DNF
5-7-2019	Manure tests, CY2019 application rate	DNF
3-24-2020	Manure tests, CY2020 application rate	DNF
11-24-2020	Manure tests, CY2021 application rate	DNF
4-16-2021	Manure tests, CY2021 application rate	DNF
10-22-2021	Manure tests, CY2022 application rate	DNF
4-18-2022	Manure tests, CY2022 application rate	DNF
10-13-2022	Manure tests, CY2023 application rate	DNF
4-5-2023	Manure tests, CY2023 application rate	DNF

10-13-2023	Manure tests, CY2024 application rate	DNF
4-5-2024	Manure tests, CY2024 application rate	DNF
9-18-2024	Manure tests, CY2025 application rate	DNF
4-2-2025	Manure tests, CY2025 application rate	DNF

MAURER-STUTZ **SMITHFIELD - MT. ERIE - SPRING MANURE APPLICATION**

Project Number: 23804009.11
Planned By: DNF

CROP YEAR 2025

Field Number	2024 Crop	2025 Crop (Projected)	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations		
				N	P2O5	K2O
B1 - Bailey 1	Corn Grain	Soybeans	23	196	37	56
B2 - Bailey 2	Soybeans	Corn Grain	19	196	86	56
B3 - Bailey 3	Corn Grain	Soybeans	60	196	37	56
B4 - Bailey 4	Soybeans	Corn Grain	23	196	86	56
B5 - Bailey 5	Corn Grain	Soybeans	36	196	35	53
B6 - Bailey 6	Corn Grain	Soybeans	64	196	37	57
B7 - Bailey 7	Corn Grain	Soybeans	33	196	37	57
B8 - Bailey 8	Corn Grain	Soybeans	47	196	37	57
B9 - Bailey 9	Corn Grain	Soybeans	21	196	37	57
B10 - Bailey 10	Corn Grain	Soybeans	33	196	35	53
B11 - Bailey 11	Corn Grain	Soybeans	16	196	34	52
B12 - Bailey 12	Corn Grain	Soybeans	39	196	34	52
B21 - Bailey 21	Soybeans	Corn Grain	21	196	86	56
B22A - Bailey 22A	Soybeans	Corn Grain	16	196	86	56
S24 - Shan 24	Soybeans	Corn Grain	100	196	75	49
S25 - Shan 25	Soybeans	Corn Grain	73	196	76	50
S27 - Shan 27	Soybeans	Corn Grain	105	196	78	51
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50
S29 - Shan 29	Soybeans	Corn Grain	73	196	88	57
S30 - Shan 30	Soybeans	Corn Grain	37	196	76	50
S31E - Shan 31 E	Corn Grain	Soybeans	44	196	46	70
S31W - Shan 31 W	Corn Grain	Soybeans	56	196	46	70
S32 - Shan 32	Soybeans	Corn Grain	60	196	86	56
S33 - Shan Williams 33	Corn Grain	Soybeans	26	196	45	69
S34 - Shan Williams 34	Corn Grain	Soybeans	56	196	37	56
E16 - Eckel Bass	Corn Grain	Soybeans	21	196	43	65
E17 - Eckel Bass	Corn Grain	Soybeans	59	196	43	65
E19 - Eckel Bass	Corn Grain	Soybeans	52	196	43	65
E18 - Eckel Bass	Corn Grain	Soybeans	39	196	43	65
E20 -Eckel Bass	Corn Grain	Soybeans	94	196	28	43
H37 HolHome (931)	Corn Grain	Soybeans	46	196	37	57
H36 - Ronnie (932)	Corn Grain	Soybeans	168	196	46	70
H38 - West Willy	Corn Grain	Soybeans	60	196	48	74
E38E - Eckel Iles E	Corn Grain	Soybeans	19	196	43	66
E35 - Eckel Bass	Corn Grain	Soybeans	21	196	43	66
E38N (Ekel Iles N)	Corn Grain	Soybeans	78	196	43	66
E38S (Eckel Iles S)	Corn Grain	Soybeans	86	196	43	66
S35 - Shan 35	Soybeans	Corn Grain	32	196	84	55
S36 - Shan 36	Soybeans	Corn Grain	91	196	80	52
L39 Lynch	Soybeans	Corn Grain	142	196	77	50

MAURER-STUTZ

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION RECORDS
CROP YEAR 2025

Project Number: 23804009.11
Planned By: DNF

Field Number	2024 Crop	2025 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Corn Grain	Soybeans	23	196	37	56											
B2 - Bailey 2	Soybeans	Corn Grain	19	196	86	56	17.14	230	19.0							5	258
B3 - Bailey 3	Corn Grain	Soybeans	45	196	37	56	24.70	230	45.0							7	372
B4 - Bailey 4	Soybeans	Corn Grain	23	196	86	56	11.13	230	23.0							3	170
B5 - Bailey 5	Corn Grain	Soybeans	36	196	35	53											
B6 - Bailey 6	Corn Grain	Soybeans	64	196	37	57	27.70	231	64.0							27	455
B7 - Bailey 7	Corn Grain	Soybeans	33	196	37	57	7.57	231	33.0							7	124
B8 - Bailey 8	Corn Grain	Soybeans	47	196	37	57	7.60	229	47.0	11.13	231	47.0				27	352
B9 - Bailey 9	Corn Grain	Soybeans	21	196	37	57											
B10 - Bailey 10	Corn Grain	Soybeans	33	196	35	53	18.81	229	33.0							39	410
B11 - Bailey 11	Corn Grain	Soybeans	16	196	34	52	23.77	229	16.0							50	522
B12 - Bailey 12	Corn Grain	Soybeans	39	196	34	52	22.58	229	39.0							47	490
B21 - Bailey 21	Soybeans	Corn Grain	21	196	86	56	19.22	230	21.0							6	292
B22A - Bailey 22A	Soybeans	Corn Grain	16	196	86	56	22.87	230	16.0							7	344
S24 - Shan 24	Soybeans	Corn Grain	100	196	75	49											
S25 - Shan 25	Soybeans	Corn Grain	73	196	76	50											
S27 - Shan 27	Soybeans	Corn Grain	105	196	78	51											
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50											
S29 - Shan 29	Soybeans	Corn Grain	73	196	88	57											
S30 - Shan 30	Soybeans	Corn Grain	37	196	76	50											
S31E - Shan 31 E	Corn Grain	Soybeans	44	196	46	70											
S31W - Shan 31 W	Corn Grain	Soybeans	56	196	46	70											
S32 - Shan 32	Soybeans	Corn Grain	60	196	86	56											
S33 - Shan Williams 33	Corn Grain	Soybeans	26	196	45	69											
S34 - Shan Williams 34	Corn Grain	Soybeans	56	196	37	56											
E16 - Eckel Bass	Corn Grain	Soybeans	21	196	43	65											
E17 - Eckel Bass	Corn Grain	Soybeans	59	196	43	65											
E19 - Eckel Bass	Corn Grain	Soybeans	52	196	43	65											
E18 - Eckel Bass	Corn Grain	Soybeans	39	196	43	65											
E20 -Eckel Bass	Corn Grain	Soybeans	94	196	28	43											
H37 HolHome (931)	Corn Grain	Soybeans	46	196	37	57											
H36 - Ronnie (932)	Corn Grain	Soybeans	168	196	46	70	19.687	228	168.0							20	379
H38 - West Willy	Corn Grain	Soybeans	61	196	48	74	22.818	228	61.0							23	440
E38E - Eckel Iles E	Corn Grain	Soybeans	19	196	43	66											
E35 - Eckel Bass	Corn Grain	Soybeans	21	196	43	66											
E38N (Ekel Iles N)	Corn Grain	Soybeans	78	196	43	66											
E38S (Eckel Iles S)	Corn Grain	Soybeans	86	196	43	66											
S35 - Shan 35	Soybeans	Corn Grain	32	196	84	55											
S36 - Shan 36	Soybeans	Corn Grain	92	196	80	52											
L39 Lynch	Soybeans	Corn Grain	142	196	77	50											

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2025 - SPRING APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	79,513	183,995	1,828,803	67,181	173,661	1,545,159	154,635	219,865	3,556,607	84,030	172,723	1,932,690	98,492	165,850	2,265,327
B2 - Bailey 2	77,491	172,119	1,480,070	65,472	162,453	1,250,513	150,702	205,674	2,878,401	81,893	161,575	1,564,147	95,987	155,145	1,833,353
B3 - Bailey 3	76,599	166,882	3,477,579	64,718	157,510	2,938,211	148,967	199,416	6,763,101	80,950	156,659	3,675,126	94,882	150,425	4,307,654
B4 - Bailey 4	78,182	176,180	1,774,737	66,056	166,286	1,499,478	152,047	210,527	3,451,460	82,623	165,387	1,875,552	96,844	158,806	2,198,355
B5 - Bailey 5	79,513	183,995	2,862,475	67,181	173,661	2,418,509	154,635	219,865	5,566,864	84,030	172,723	3,025,080	98,492	165,850	3,545,729
B6 - Bailey 6	68,721	163,047	4,411,915	58,063	153,890	3,727,633	133,648	194,833	8,580,173	72,625	153,058	4,662,538	85,125	146,968	5,465,010
B7 - Bailey 7	76,563	178,268	2,526,585	64,688	168,257	2,134,715	148,898	213,022	4,913,634	80,912	167,347	2,670,110	94,838	160,688	3,129,664
B8 - Bailey 8	68,629	167,821	3,191,240	57,985	158,386	2,696,283	133,467	200,539	6,206,238	72,527	157,540	3,372,521	85,010	151,271	3,952,968
B9 - Bailey 9	79,513	183,995	1,693,631	67,181	173,661	1,430,951	154,635	219,865	3,293,728	84,030	172,723	1,789,839	98,492	165,850	2,097,889
B10 - Bailey 10	63,519	165,132	2,064,354	53,667	155,859	1,744,176	123,529	197,326	4,014,701	67,127	155,016	2,181,622	78,680	148,848	2,557,102
B11 - Bailey 11	59,138	159,967	934,384	49,966	150,983	789,463	115,010	191,153	1,817,165	62,498	150,167	987,463	73,254	144,192	1,157,416
B12 - Bailey 12	60,402	161,457	2,367,749	51,034	152,390	2,000,515	117,468	192,934	4,604,736	63,833	151,566	2,502,252	74,819	145,535	2,932,916
B21 - Bailey 21	77,224	170,551	1,606,250	65,246	160,973	1,357,123	150,182	203,801	3,123,791	81,610	160,103	1,697,494	95,656	153,732	1,989,651
B22A - Bailey 22A	76,815	168,151	1,229,037	64,901	158,708	1,038,416	149,387	200,933	2,390,199	81,178	157,850	1,298,854	95,150	151,569	1,522,401
S24 - Shan 24	79,513	183,995	7,911,562	67,181	173,661	6,684,490	154,635	219,865	15,386,193	84,030	172,723	8,360,986	98,492	165,850	9,800,000
S25 - Shan 25	79,513	183,995	5,796,511	67,181	173,661	4,897,481	154,635	219,865	11,272,899	84,030	172,723	6,125,788	98,492	165,850	7,180,101
S27 - Shan 27	79,513	183,995	8,332,982	67,181	173,661	7,040,548	154,635	219,865	16,205,759	84,030	172,723	8,806,345	98,492	165,850	10,322,010
S28 - Shan 28	79,513	183,995	8,602,110	67,181	173,661	7,436,915	154,635	219,865	17,118,107	84,030	172,723	9,302,122	98,492	165,850	10,903,116
S29 - Shan 29	79,513	183,995	5,804,462	67,181	173,661	4,904,199	154,635	219,865	11,288,363	84,030	172,723	6,134,191	98,492	165,850	7,189,950
S30 - Shan 30	79,513	183,995	2,957,890	67,181	173,661	2,499,126	154,635	219,865	5,752,426	84,030	172,723	3,125,916	98,492	165,850	3,663,920
S31E - Shan 31 E	79,513	183,995	3,514,483	67,181	173,661	2,969,392	154,635	219,865	6,834,872	84,030	172,723	3,714,126	98,492	165,850	4,353,367
S31W - Shan 31 W	79,513	183,995	4,452,738	67,181	173,661	3,762,125	154,635	219,865	8,659,566	84,030	172,723	4,705,681	98,492	165,850	5,515,578
S32 - Shan 32	79,513	183,995	4,746,937	67,181	173,661	4,010,694	154,635	219,865	9,231,716	84,030	172,723	5,016,592	98,492	165,850	5,880,000
S33 - Shan Williams 33	79,513	183,995	2,051,440	67,181	173,661	1,733,265	154,635	219,865	3,989,586	84,030	172,723	2,167,974	98,492	165,850	2,541,106
S34 - Shan Williams 34	79,513	183,995	4,436,836	67,181	173,661	3,748,689	154,635	219,865	8,628,639	84,030	172,723	4,688,875	98,492	165,850	5,495,879
E16 - Eckel Bass	79,513	183,995	1,630,020	67,181	173,661	1,377,207	154,635	219,865	3,170,020	84,030	172,723	1,722,615	98,492	165,850	2,019,095
E17 - Eckel Bass	79,513	183,995	4,667,424	67,181	173,661	3,943,513	154,635	219,865	9,077,081	84,030	172,723	4,932,562	98,492	165,850	5,781,508
E19 - Eckel Bass	79,513	183,995	4,166,491	67,181	173,661	3,520,274	154,635	219,865	8,102,880	84,030	172,723	4,403,173	98,492	165,850	5,161,005
E18 - Eckel Bass	79,513	183,995	3,124,868	67,181	173,661	2,640,206	154,635	219,865	6,077,160	84,030	172,723	3,302,379	98,492	165,850	3,870,754
E20 -Eckel Bass	79,513	183,995	7,442,434	67,181	173,661	6,288,123	154,635	219,865	14,473,846	84,030	172,723	7,865,209	98,492	165,850	9,218,894
H37 HolHome (931)	79,513	183,995	3,649,655	67,181	173,661	3,083,599	154,635	219,865	7,097,751	84,030	172,723	3,856,977	98,492	165,850	4,520,804
H36 - Ronnie (932)	71,573	166,575	12,045,815	60,473	157,220	10,177,527	139,194	199,049	23,426,378	75,639	156,370	12,730,089	88,658	150,148	14,921,072
H38 - West Willy	70,296	163,771	4,281,004	59,393	154,574	3,617,027	136,709	195,699	8,325,582	74,289	153,738	4,524,191	87,075	147,621	5,302,852
E38E - Eckel Iles E	79,513	183,995	1,502,799	67,181	173,661	1,269,717	154,635	219,865	2,922,604	84,030	172,723	1,588,167	98,492	165,850	1,861,508
E35 - Eckel Bass	79,513	183,995	1,637,972	67,181	173,661	1,383,925	154,635	219,865	3,185,483	84,030	172,723	1,731,018	98,492	165,850	2,028,945
E38N (Ekel Iles N)	79,513	183,995	6,225,882	67,181	173,661	5,260,257	154,635	219,865	12,107,929	84,030	172,723	6,579,550	98,492	165,850	7,711,960
E38S (Eckel Iles S)	79,513	183,995	6,838,134	67,181	173,661	5,777,549	154,635	219,865	13,298,619	84,030	172,723	7,226,581	98,492	165,850	8,470,352
S35 - Shan 35	79,513	183,995	2,560,325	67,181	173,661	2,163,222	154,635	219,865	4,979,250	84,030	172,723	2,705,766	98,492	165,850	3,171,457
S36 - Shan 36	79,513	183,995	7,275,456	67,181	173,661	6,147,044	154,635	219,865	14,149,112	84,030	172,723	7,688,746	98,492	165,850	9,012,060
L39 Lynch	79,513	183,995	11,298,824	67,181	173,661	9,546,392	154,635	219,865	21,973,649	84,030	172,723	11,940,665	98,492	165,850	13,995,779

MAURER-STUTZ

Project Number: 23804009.1

Planned By: DNF

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2025

Fall 2024 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	0.97	0.77	4.61	2,305	0.73	0.27	0.99	19.24	207942
4089A	229	2.26	1.12	5.20	2,600	1.70	0.39	2.09	21.70	184348
4090	230	0.14	0.52	3.61	1,805	0.11	0.18	0.29	15.06	265543
4091A	231	1.11	0.37	3.94	1,970	0.83	0.13	0.96	16.44	243302
4092	232	1.98	0.70	5.86	2,930	1.49	0.25	1.73	24.45	163586

Spring 2025 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	2.96	0.70	5.21	2,605	2.22	0.25	2.47	21.74	183995
4089A	229	3.75	0.30	5.52	2,760	2.81	0.11	2.92	23.03	173661
4090	230	1.55	0.30	4.36	2,180	1.16	0.11	1.27	18.19	219865
4091A	231	2.83	0.60	5.55	2,775	2.12	0.21	2.33	23.16	172723
4092	232	2.28	0.80	5.78	2,890	1.71	0.28	1.99	24.12	165850

MAURER-STUTZ

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION

Project Number: 23804009.11
Planned By: DNF

CROP YEAR 2023

Field Number	2022 Crop	2023 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations		
				N	P2O5	K2O
S24 - Shan 24	Soybeans	Corn Grain	100	196	67	43
S25 - Shan 25	Soybeans	Corn Grain	73	196	52	34
S27 - Shan 27	Soybeans	Corn Grain	105	196	69	45
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50
S29 - Shan 29	Soybeans	Corn Grain	73	196	75	49
S30 - Shan 30	Soybeans	Corn Grain	37	196	63	41
S32 - Shan 32	Soybeans	Corn Grain	60	196	75	49
S35 - Shan 35	Soybeans	Corn Grain	32	196	80	52

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2023 - FALL APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
S24 - Shan 24	182,326	220,878	18,141,395	78,322	168,177	7,793,007	136,824	232,673	13,613,962	134,940	212,552	13,426,506	206,316	191,340	19,038,292
S25 - Shan 25	182,326	220,878	13,291,535	78,322	168,177	5,709,650	136,824	232,673	9,974,450	134,940	212,552	9,837,108	206,316	191,340	13,948,658
S27 - Shan 27	182,326	220,878	19,107,721	78,322	168,177	8,208,112	136,824	232,673	14,339,127	134,940	212,552	14,141,687	206,316	191,340	20,052,392
S28 - Shan 28	182,326	220,878	20,183,442	78,322	168,177	8,670,210	136,824	232,673	15,146,387	134,940	212,552	14,937,831	206,316	191,340	21,181,295
S29 - Shan 29	182,326	220,878	13,309,767	78,322	168,177	5,717,483	136,824	232,673	9,988,133	134,940	212,552	9,850,602	206,316	191,340	13,967,792
S30 - Shan 30	182,326	220,878	6,782,512	78,322	168,177	2,913,566	136,824	232,673	5,089,843	134,940	212,552	5,019,759	206,316	191,340	7,117,834
S32 - Shan 32	182,326	220,878	10,884,837	78,322	168,177	4,675,804	136,824	232,673	8,168,377	134,940	212,552	8,055,904	206,316	191,340	11,422,975
S35 - Shan 35	182,326	220,878	5,870,884	78,322	168,177	2,521,958	136,824	232,673	4,405,724	134,940	212,552	4,345,060	206,316	191,340	6,161,136

MAURER-STUTZ

Project Number: 23804009.1

Planned By: DNF

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2023

Fall 2022 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	1.06	0.80	4.34	2,170	0.80	0.28	1.08	18.11	220878
4089A	229	2.87	1.00	5.70	2,850	2.15	0.35	2.50	23.78	168177
4090	230	1.49	0.90	4.12	2,060	1.12	0.32	1.43	17.19	232673
4091A	231	1.75	0.40	4.51	2,255	1.31	0.14	1.45	18.82	212552
4092	232	1.08	0.40	5.01	2,505	0.81	0.14	0.95	20.91	191340

MAURER-STUTZ

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION

Project Number: 23804009.11
Planned By: DNF

CROP YEAR 2024

Field Number	2023 Crop	2024 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations		
				N	P2O5	K2O
B1 - Bailey 1	Corn Grain	Soybeans	23	196	41	62
B2 - Bailey 2	Corn Grain	Soybeans	19	196	47	72
B3 - Bailey 3	Corn Grain	Soybeans	60	196	44	68
B4 - Bailey 4	Corn Grain	Soybeans	23	196	42	64
B5 - Bailey 5	Corn Grain	Soybeans	36	196	35	53
B6 - Bailey 6	Wheat Grain-Straw	Corn Grain	64	196	70	46
B7 - Bailey 7	Wheat Grain-Straw	Corn Grain	33	196	70	46
B8 - Bailey 8	Wheat Grain-Straw	Corn Grain	47	196	70	46
B9 - Bailey 9	Wheat Grain-Straw	Corn Grain	21	196	75	49
B10 - Bailey 10	Corn Grain	Soybeans	33	196	45	69
B11 - Bailey 11	Wheat Grain-Straw	Corn Grain	16	196	75	49
B12 - Bailey 12	Wheat Grain-Straw	Corn Grain	39	196	75	49
B21 - Bailey 21	Corn Grain	Soybeans	21	196	40	61
B22A - Bailey 22A	Corn Grain	Soybeans	16	196	42	64
S24 - Shan 24	Soybeans	Corn Grain	100	196	67	43
S25 - Shan 25	Soybeans	Corn Grain	73	196	52	34
S27 - Shan 27	Soybeans	Corn Grain	105	196	69	45
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50
S29 - Shan 29	Soybeans	Corn Grain	73	196	75	49
S30 - Shan 30	Soybeans	Corn Grain	37	196	63	41
S31E - Shan 31 E	Soybeans	Corn Grain	44	196	53	34
S31W - Shan 31 W	Soybeans	Corn Grain	56	196	53	34
S32 - Shan 32	Soybeans	Corn Grain	60	196	75	49
S33 - Shan Williams 33	Soybeans	Corn Grain	26	196	32	21
S34 - Shan Williams 34	Soybeans	Corn Grain	56	196	46	30
E16 - Eckel Bass	Corn Grain	Soybeans	21	196	31	47
E17 - Eckel Bass	Corn Grain	Soybeans	59	196	43	65
E19 - Eckel Bass	Corn Grain	Soybeans	52	196	43	65
E18 - Eckel Bass	Corn Grain	Soybeans	39	196	28	43
E20 -Eckel Bass	Corn Grain	Soybeans	94	196	28	43
H37 HolHome (931)	Wheat Grain-Straw	Corn Grain	46	196	86	56
H36 - Ronnie (932)	Soybeans	Corn Grain	168	196	74	48
H38 - West Willy	Soybeans	Corn Grain	60	196	58	38
E38E - Eckel Iles E	Corn Grain	Soybeans	19	196	26	40
E35 - Eckel Bass	Corn Grain	Soybeans	21	196	43	66
E38N (Ekel Iles N)	Corn Grain	Soybeans	78	196	26	40
E38S (Eckel Iles S)	Corn Grain	Soybeans	86	196	26	40
S35 - Shan 35	Soybeans	Corn Grain	32	196	80	52
S36 - Shan 36	Soybeans	Corn Grain	91	196	79	52
L39 Lynch	Corn Grain	Soybeans	142	196	37	56

MAURER-STUTZ

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION RECORDS
CROP YEAR 2024

Project Number: 23804009.11
Planned By: DNF

Field Number	2023 Crop	2024 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Corn Grain	Soybeans	23	196	41	62	30.62	232	23.0							78	874
B2 - Bailey 2	Corn Grain	Soybeans	19	196	47	72	19.14	232	19.0							49	546
B3 - Bailey 3	Corn Grain	Soybeans	45	196	44	68	23.98	232	45.0							61	684
B4 - Bailey 4	Corn Grain	Soybeans	23	196	42	64											
B5 - Bailey 5	Corn Grain	Soybeans	36	196	35	53											
B6 - Bailey 6	Wheat Grain-Straw	Corn Grain	64	196	70	46	15.00	231	64.0							14	251
B7 - Bailey 7	Wheat Grain-Straw	Corn Grain	33	196	70	46	28.34	231	33.0							26	474
B8 - Bailey 8	Wheat Grain-Straw	Corn Grain	47	196	70	46	18.13	231	47.0							17	307
B9 - Bailey 9	Wheat Grain-Straw	Corn Grain	21	196	75	49	9.61	231	21.0							9	161
B10 - Bailey 10	Corn Grain	Soybeans	33	196	45	69	15.97	229	33.0							38	380
B11 - Bailey 11	Wheat Grain-Straw	Corn Grain	16	196	75	49	18.77	229	16.0							45	446
B12 - Bailey 12	Wheat Grain-Straw	Corn Grain	39	196	75	49	20.09	229	39.0							47	471
B21 - Bailey 21	Corn Grain	Soybeans	21	196	40	61											
B22A - Bailey 22A	Corn Grain	Soybeans	16	196	42	64	21.83	232	16.0							56	623
S24 - Shan 24	Soybeans	Corn Grain	100	196	67	43											
S25 - Shan 25	Soybeans	Corn Grain	73	196	52	34											
S27 - Shan 27	Soybeans	Corn Grain	105	196	69	45											
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50											
S29 - Shan 29	Soybeans	Corn Grain	73	196	75	49											
S30 - Shan 30	Soybeans	Corn Grain	37	196	63	41											
S31E - Shan 31 E	Soybeans	Corn Grain	44	196	53	34											
S31W - Shan 31 W	Soybeans	Corn Grain	56	196	53	34											
S32 - Shan 32	Soybeans	Corn Grain	60	196	75	49											
S33 - Shan Williams 33	Soybeans	Corn Grain	26	196	32	21											
S34 - Shan Williams 34	Soybeans	Corn Grain	56	196	46	30											
E16 - Eckel Bass	Corn Grain	Soybeans	21	196	31	47											
E17 - Eckel Bass	Corn Grain	Soybeans	59	196	43	65											
E19 - Eckel Bass	Corn Grain	Soybeans	52	196	43	65											
E18 - Eckel Bass	Corn Grain	Soybeans	39	196	28	43											
E20 -Eckel Bass	Corn Grain	Soybeans	94	196	28	43											
H37 HolHome (931)	Wheat Grain-Straw	Corn Grain	46	196	86	56	19.820	232	46.0							51	567
H36 - Ronnie (932)	Soybeans	Corn Grain	168	196	74	48	6.090	228	168.0	3.800	230	168.0				12	185
H38 - West Willy	Soybeans	Corn Grain	61	196	58	38											
E38E - Eckel Iles E	Corn Grain	Soybeans	19	196	26	40											
E35 - Eckel Bass	Corn Grain	Soybeans	21	196	43	66											
E38N (Ekel Iles N)	Corn Grain	Soybeans	78	196	26	40											
E38S (Eckel Iles S)	Corn Grain	Soybeans	86	196	26	40											
S35 - Shan 35	Soybeans	Corn Grain	32	196	80	52											
S36 - Shan 36	Soybeans	Corn Grain	92	196	79	52											
L39 Lynch	Corn Grain	Soybeans	142	196	37	56											

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2024 - SPRING APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	50,534	132,834	1,162,275	37,758	121,423	868,441	65,616	152,273	1,509,174	34,593	122,415	795,645	44,259	110,499	1,017,947
B2 - Bailey 2	63,159	146,754	1,206,329	47,192	134,148	901,358	82,009	168,230	1,566,377	43,236	135,244	825,803	55,316	122,079	1,056,531
B3 - Bailey 3	57,834	140,883	2,625,647	43,213	128,781	1,961,860	75,095	161,500	3,409,313	39,591	129,833	1,797,410	50,652	117,195	2,299,602
B4 - Bailey 4	84,211	169,967	1,911,579	62,921	155,367	1,428,315	109,344	194,840	2,482,120	57,647	156,636	1,308,588	73,754	141,388	1,674,205
B5 - Bailey 5	84,211	169,967	3,031,579	62,921	155,367	2,265,169	109,344	194,840	3,936,402	57,647	156,636	2,075,294	73,754	141,388	2,655,127
B6 - Bailey 6	78,217	159,302	5,021,530	58,443	145,618	3,752,042	101,562	182,614	6,520,285	53,544	146,807	3,437,532	68,504	132,516	4,397,972
B7 - Bailey 7	72,887	149,817	2,405,261	54,460	136,948	1,797,190	94,641	171,741	3,123,149	49,895	138,067	1,646,543	63,836	124,627	2,106,583
B8 - Bailey 8	76,888	156,938	3,575,312	57,450	143,457	2,671,441	99,837	179,904	4,642,420	52,635	144,629	2,447,511	67,341	130,550	3,131,341
B9 - Bailey 9	80,371	163,134	1,711,895	60,052	149,121	1,279,113	104,359	187,007	2,222,837	55,018	150,339	1,171,893	70,390	135,704	1,499,317
B10 - Bailey 10	67,890	153,808	2,206,436	50,727	140,596	1,648,629	88,153	176,317	2,864,981	46,475	141,745	1,510,435	59,460	127,947	1,932,447
B11 - Bailey 11	65,080	151,026	1,028,271	48,628	138,053	768,315	84,505	173,128	1,335,175	44,551	139,181	703,912	56,999	125,633	900,583
B12 - Bailey 12	63,991	149,948	2,508,449	47,814	137,067	1,874,291	83,090	171,891	3,257,136	43,806	138,187	1,717,181	56,045	124,735	2,196,958
B21 - Bailey 21	84,211	169,967	1,751,579	62,921	155,367	1,308,764	109,344	194,840	2,274,365	57,647	156,636	1,199,059	73,754	141,388	1,534,073
B22A - Bailey 22A	60,199	143,491	963,180	44,980	131,165	719,680	78,166	164,489	1,250,657	41,210	132,237	659,354	52,723	119,364	843,576
S24 - Shan 24	84,211	169,967	8,378,947	62,921	155,367	6,260,674	109,344	194,840	10,879,777	57,647	156,636	5,735,882	73,754	141,388	7,338,476
S25 - Shan 25	84,211	169,967	6,138,947	62,921	155,367	4,586,966	109,344	194,840	7,971,213	57,647	156,636	4,202,471	73,754	141,388	5,376,632
S27 - Shan 27	84,211	169,967	8,825,263	62,921	155,367	6,594,157	109,344	194,840	11,459,303	57,647	156,636	6,041,412	73,754	141,388	7,729,370
S28 - Shan 28	84,211	169,967	9,322,105	62,921	155,367	6,965,393	109,344	194,840	12,104,435	57,647	156,636	6,381,529	73,754	141,388	8,164,516
S29 - Shan 29	84,211	169,967	6,147,368	62,921	155,367	4,593,258	109,344	194,840	7,982,148	57,647	156,636	4,208,235	73,754	141,388	5,384,008
S30 - Shan 30	84,211	169,967	3,132,632	62,921	155,367	2,340,674	109,344	194,840	4,067,615	57,647	156,636	2,144,471	73,754	141,388	2,743,631
S31E - Shan 31 E	84,211	169,967	3,722,105	62,921	155,367	2,781,124	109,344	194,840	4,833,026	57,647	156,636	2,548,000	73,754	141,388	3,259,906
S31W - Shan 31 W	84,211	169,967	4,715,789	62,921	155,367	3,523,596	109,344	194,840	6,123,291	57,647	156,636	3,228,235	73,754	141,388	4,130,198
S32 - Shan 32	84,211	169,967	5,027,368	62,921	155,367	3,756,404	109,344	194,840	6,527,866	57,647	156,636	3,441,529	73,754	141,388	4,403,086
S33 - Shan Williams 33	84,211	169,967	2,172,632	62,921	155,367	1,623,371	109,344	194,840	2,821,088	57,647	156,636	1,487,294	73,754	141,388	1,902,841
S34 - Shan Williams 34	84,211	169,967	4,698,947	62,921	155,367	3,511,011	109,344	194,840	6,101,423	57,647	156,636	3,216,706	73,754	141,388	4,115,447
E16 - Eckel Bass	84,211	169,967	1,726,316	62,921	155,367	1,289,888	109,344	194,840	2,241,562	57,647	156,636	1,181,765	73,754	141,388	1,511,947
E17 - Eckel Bass	84,211	169,967	4,943,158	62,921	155,367	3,693,483	109,344	194,840	6,418,522	57,647	156,636	3,383,882	73,754	141,388	4,329,332
E19 - Eckel Bass	84,211	169,967	4,412,632	62,921	155,367	3,297,079	109,344	194,840	5,729,651	57,647	156,636	3,020,706	73,754	141,388	3,864,685
E18 - Eckel Bass	84,211	169,967	3,309,474	62,921	155,367	2,472,809	109,344	194,840	4,297,238	57,647	156,636	2,265,529	73,754	141,388	2,898,514
E20 -Eckel Bass	84,211	169,967	7,882,105	62,921	155,367	5,889,438	109,344	194,840	10,234,644	57,647	156,636	5,395,765	73,754	141,388	6,903,330
H37 HolHome (931)	62,363	145,877	2,862,469	46,597	133,346	2,138,811	80,976	167,225	3,716,818	42,691	134,436	1,959,528	54,619	121,349	2,507,017
H36 - Ronnie (932)	79,129	162,098	13,317,342	59,124	148,174	9,950,598	102,746	185,819	17,292,113	54,168	149,384	9,116,504	69,303	134,842	11,663,636
H38 - West Willy	84,211	169,967	5,128,421	62,921	155,367	3,831,910	109,344	194,840	6,659,079	57,647	156,636	3,510,706	73,754	141,388	4,491,590
E38E - Eckel Iles E	84,211	169,967	1,591,579	62,921	155,367	1,189,213	109,344	194,840	2,066,611	57,647	156,636	1,089,529	73,754	141,388	1,393,942
E35 - Eckel Bass	84,211	169,967	1,734,737	62,921	155,367	1,296,180	109,344	194,840	2,252,497	57,647	156,636	1,187,529	73,754	141,388	1,519,323
E38N (Ekel Iles N)	84,211	169,967	6,593,684	62,921	155,367	4,926,742	109,344	194,840	8,561,674	57,647	156,636	4,513,765	73,754	141,388	5,774,901
E38S (Eckel Iles S)	84,211	169,967	7,242,105	62,921	155,367	5,411,236	109,344	194,840	9,403,626	57,647	156,636	4,957,647	73,754	141,388	6,342,803
S35 - Shan 35	84,211	169,967	2,711,579	62,921	155,367	2,026,067	109,344	194,840	3,520,893	57,647	156,636	1,856,235	73,754	141,388	2,374,864
S36 - Shan 36	84,211	169,967	7,705,263	62,921	155,367	5,757,303	109,344	194,840	10,005,021	57,647	156,636	5,274,706	73,754	141,388	6,748,448
L39 Lynch	84,211	169,967	11,966,316	62,921	155,367	8,941,124	109,344	194,840	15,537,852	57,647	156,636	8,191,647	73,754	141,388	10,480,376

MAURER-STUTZ

Project Number: 23804009.1

Planned By: DNF

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2024

Fall 2023 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	1.25	0.30	4.58	2,290	0.94	0.11	1.04	19.11	209304
4089A	229	2.89	0.50	5.62	2,810	2.17	0.18	2.34	23.45	170571
4090	230	1.65	0.60	4.36	2,180	1.24	0.21	1.45	18.19	219865
4091A	231	0.96	0.60	4.01	2,005	0.72	0.21	0.93	16.73	239055
4092	232	3.18	0.50	6.84	3,420	2.39	0.18	2.56	28.54	140148

Spring 2024 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	3.01	0.20	5.64	2,820	2.26	0.07	2.33	23.53	169967
4089A	229	3.92	0.50	6.17	3,085	2.94	0.18	3.12	25.75	155367
4090	230	2.25	0.30	4.92	2,460	1.69	0.11	1.79	20.53	194840
4091A	231	4.16	0.80	6.12	3,060	3.12	0.28	3.40	25.54	156636
4092	232	3.31	0.50	6.78	3,390	2.48	0.18	2.66	28.29	141388

Ammonia Loss:	0.25	Broadcast
Organic Mineralization:	0.35	

x Salt Application Rate 4,000 lbs/acre

MAURER-STUTZ

SMITHFIELD - MT. ERIE - SPRING MANURE APPLICATION

Project Number: 23804009.11
Planned By: DNF

CROP YEAR 2023

Field Number	2022 Crop	2023 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations		
				N	P2O5	K2O
B1 - Bailey 1	Soybeans	Corn Grain	23	196	86	56
B2 - Bailey 2	Soybeans	Corn Grain	19	196	75	49
B3 - Bailey 3	Soybeans	Corn Grain	60	196	75	49
B4 - Bailey 4	Soybeans	Corn Grain	23	196	63	41
B5 - Bailey 5	Soybeans	Corn Grain	36	196	86	56
B6 - Bailey 6	Soybeans	Corn Grain	64	196	70	46
B7 - Bailey 7	Soybeans	Corn Grain	33	196	70	46
B8 - Bailey 8	Soybeans	Corn Grain	47	196	70	46
B9 - Bailey 9	Soybeans	Corn Grain	21	196	75	49
B10 - Bailey 10	Soybeans	Corn Grain	33	196	75	49
B11 - Bailey 11	Soybeans	Corn Grain	16	196	75	49
B12 - Bailey 12	Soybeans	Corn Grain	39	196	75	49
B21 - Bailey 21	Soybeans	Corn Grain	21	196	86	56
B22A - Bailey 22A	Soybeans	Corn Grain	16	196	75	49
S24 - Shan 24	Soybeans	Corn Grain	100	196	67	43
S25 - Shan 25	Soybeans	Corn Grain	73	196	52	34
S27 - Shan 27	Soybeans	Corn Grain	105	196	69	45
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50
S29 - Shan 29	Soybeans	Corn Grain	73	196	75	49
S30 - Shan 30	Soybeans	Corn Grain	37	196	63	41
S31E - Shan 31 E	Corn Grain	Soybeans	44	196	42	64
S31W - Shan 31 W	Corn Grain	Soybeans	56	196	42	64
S32 - Shan 32	Soybeans	Corn Grain	60	196	75	49
S33 - Shan Williams 33	Corn Grain	Soybeans	26	196	48	73
S34 - Shan Williams 34	Corn Grain	Soybeans	56	196	31	47
E16 - Eckel Bass	Soybeans	Corn Grain	21	196	86	56
E17 - Eckel Bass	Soybeans	Corn Grain	59	196	81	53
E19 - Eckel Bass	Soybeans	Corn Grain	52	196	76	50
E18 - Eckel Bass	Soybeans	Corn Grain	39	196	81	53
E20 -Eckel Bass	Soybeans	Corn Grain	94	196	71	46
H37 HolHome (931)	Soybeans	Corn Grain	46	196	86	56
H36 - Ronnie (932)	Soybeans	Corn Grain	168	196	74	48
H38 - West Willy	Soybeans	Corn Grain	60	196	58	38
E38E - Eckel Iles E	Soybeans	Corn Grain	19	196	84	55
E35 - Eckel Bass	Soybeans	Corn Grain	21	196	80	52
E38N (Ekel Iles N)	Soybeans	Corn Grain	78	196	84	55
E38S (Eckel Iles S)	Soybeans	Corn Grain	86	196	84	55
S35 - Shan 35	Soybeans	Corn Grain	32	196	80	52
S36 - Shan 36	Corn Grain	Soybeans	91	196	40	61
L39 Lynch	Corn Grain	Soybeans	142	196	37	56

MAURER-STUTZ

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION RECORDS
CROP YEAR 2023

Project Number: 23804009.11
Planned By: DNF

Field Number	2022 Crop	2023 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Soybeans	Corn Grain	23	196	86	56											
B2 - Bailey 2	Soybeans	Corn Grain	19	196	75	49											
B3 - Bailey 3	Soybeans	Corn Grain	45	196	75	49											
B4 - Bailey 4	Soybeans	Corn Grain	23	196	63	41											
B5 - Bailey 5	Soybeans	Corn Grain	36	196	86	56											
B6 - Bailey 6	Soybeans	Corn Grain	64	196	70	46											
B7 - Bailey 7	Soybeans	Corn Grain	33	196	70	46											
B8 - Bailey 8	Soybeans	Corn Grain	47	196	70	46											
B9 - Bailey 9	Soybeans	Corn Grain	21	196	75	49											
B10 - Bailey 10	Soybeans	Corn Grain	33	196	75	49											
B11 - Bailey 11	Soybeans	Corn Grain	16	196	75	49											
B12 - Bailey 12	Soybeans	Corn Grain	39	196	75	49											
B21 - Bailey 21	Soybeans	Corn Grain	21	196	86	56											
B22A - Bailey 22A	Soybeans	Corn Grain	16	196	75	49											
S24 - Shan 24	Soybeans	Corn Grain	100	196	67	43	19.809	230	100.0							29	342
S25 - Shan 25	Soybeans	Corn Grain	73	196	52	34	25.438	231	73.0							37	479
S27 - Shan 27	Soybeans	Corn Grain	105	196	69	45											
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50	10.796	231	111.0							16	204
S29 - Shan 29	Soybeans	Corn Grain	73	196	75	49	18.493	232	73.0							18	387
S30 - Shan 30	Soybeans	Corn Grain	37	196	63	41	19.889	229	37.0							50	473
S31E - Shan 31 E	Corn Grain	Soybeans	44	196	42	64											
S31W - Shan 31 W	Corn Grain	Soybeans	56	196	42	64											
S32 - Shan 32	Soybeans	Corn Grain	60	196	75	49	23.600	232	60.0							23	496
S33 - Shan Williams 33	Corn Grain	Soybeans	26	196	48	73											
S34 - Shan Williams 34	Corn Grain	Soybeans	56	196	31	47											
E16 - Eckel Bass	Soybeans	Corn Grain	21	196	86	56											
E17 - Eckel Bass	Soybeans	Corn Grain	59	196	81	53											
E19 - Eckel Bass	Soybeans	Corn Grain	52	196	76	50											
E18 - Eckel Bass	Soybeans	Corn Grain	39	196	81	53											
E20 -Eckel Bass	Soybeans	Corn Grain	94	196	71	46											
H37 HolHome (931)	Soybeans	Corn Grain	46	196	86	56											
H36 - Ronnie (932)	Soybeans	Corn Grain	168	196	74	48											
H38 - West Willy	Soybeans	Corn Grain	61	196	58	38											
E38E - Eckel Iles E	Soybeans	Corn Grain	19	196	84	55											
E35 - Eckel Bass	Soybeans	Corn Grain	21	196	80	52											
E38N (Ekel Iles N)	Soybeans	Corn Grain	78	196	84	55											
E38S (Eckel Iles S)	Soybeans	Corn Grain	86	196	84	55											
S35 - Shan 35	Soybeans	Corn Grain	32	196	80	52	21.906	229	32.0							55	521
S36 - Shan 36	Corn Grain	Soybeans	92	196	40	61											
L39 Lynch	Corn Grain	Soybeans	142	196	37	56											

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2023 - SPRING APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Nitrogen Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	93,445	181,212	2,149,225	51,921	134,826	1,194,172	117,718	221,388	2,707,508	92,019	203,960	2,116,432	91,696	152,645	2,109,006
B2 - Bailey 2	93,445	181,212	1,784,791	51,921	134,826	991,682	117,718	221,388	2,248,408	92,019	203,960	1,757,559	91,696	152,645	1,751,392
B3 - Bailey 3	93,445	181,212	4,242,384	51,921	134,826	2,357,192	117,718	221,388	5,344,384	92,019	203,960	4,177,653	91,696	152,645	4,162,994
B4 - Bailey 4	93,445	181,212	2,121,192	51,921	134,826	1,178,596	117,718	221,388	2,672,192	92,019	203,960	2,088,826	91,696	152,645	2,081,497
B5 - Bailey 5	93,445	181,212	3,364,005	51,921	134,826	1,869,139	117,718	221,388	4,237,838	92,019	203,960	3,312,676	91,696	152,645	3,301,053
B6 - Bailey 6	93,445	181,212	5,999,142	51,921	134,826	3,333,298	117,718	221,388	7,557,477	92,019	203,960	5,907,606	91,696	152,645	5,886,877
B7 - Bailey 7	93,445	181,212	3,083,671	51,921	134,826	1,713,377	117,718	221,388	3,884,685	92,019	203,960	3,036,620	91,696	152,645	3,025,965
B8 - Bailey 8	93,445	181,212	4,345,173	51,921	134,826	2,414,305	117,718	221,388	5,473,874	92,019	203,960	4,278,873	91,696	152,645	4,263,860
B9 - Bailey 9	93,445	181,212	1,990,369	51,921	134,826	1,105,907	117,718	221,388	2,507,387	92,019	203,960	1,960,000	91,696	152,645	1,953,123
B10 - Bailey 10	93,445	181,212	3,036,949	51,921	134,826	1,687,417	117,718	221,388	3,825,826	92,019	203,960	2,990,610	91,696	152,645	2,980,117
B11 - Bailey 11	93,445	181,212	1,476,424	51,921	134,826	820,344	117,718	221,388	1,859,940	92,019	203,960	1,453,897	91,696	152,645	1,448,795
B12 - Bailey 12	93,445	181,212	3,663,027	51,921	134,826	2,035,285	117,718	221,388	4,614,535	92,019	203,960	3,607,136	91,696	152,645	3,594,480
B21 - Bailey 21	93,445	181,212	1,943,647	51,921	134,826	1,079,947	117,718	221,388	2,448,529	92,019	203,960	1,913,991	91,696	152,645	1,907,275
B22A - Bailey 22A	93,445	181,212	1,495,113	51,921	134,826	830,728	117,718	221,388	1,883,483	92,019	203,960	1,472,300	91,696	152,645	1,467,135
S24 - Shan 24	79,848	165,707	7,944,868	44,366	123,289	4,414,400	100,589	202,445	10,008,625	78,630	186,508	7,823,644	78,354	139,584	7,796,192
S25 - Shan 25	75,805	159,495	5,526,172	42,119	118,668	3,070,502	95,496	194,857	6,961,649	74,648	179,517	5,441,852	74,386	134,352	5,422,758
S27 - Shan 27	93,445	181,212	9,792,992	51,921	134,826	5,441,272	117,718	221,388	12,336,817	92,019	203,960	9,643,568	91,696	152,645	9,609,731
S28 - Shan 28	85,948	171,983	9,514,464	47,755	127,959	5,286,513	108,274	210,113	11,985,939	84,637	193,572	9,369,290	84,340	144,871	9,336,415
S29 - Shan 29	85,069	163,698	6,210,012	47,267	121,795	3,450,464	107,166	199,991	7,823,123	83,771	184,247	6,115,258	83,477	137,892	6,093,801
S30 - Shan 30	69,715	159,782	2,593,408	38,736	118,881	1,440,973	87,824	195,207	3,267,071	68,652	179,839	2,553,837	68,411	134,593	2,544,876
S31E - Shan 31 E	93,445	181,212	4,130,250	51,921	134,826	2,294,887	117,718	221,388	5,203,123	92,019	203,960	4,067,230	91,696	152,645	4,052,959
S31W - Shan 31 W	93,445	181,212	5,232,896	51,921	134,826	2,907,550	117,718	221,388	6,592,192	92,019	203,960	5,153,052	91,696	152,645	5,134,971
S32 - Shan 32	82,702	158,749	4,937,306	45,952	118,113	2,743,311	104,185	193,945	6,219,820	81,440	178,677	4,861,972	81,154	133,723	4,844,912
S33 - Shan Williams 33	93,445	181,212	2,410,870	51,921	134,826	1,339,550	117,718	221,388	3,037,117	92,019	203,960	2,374,085	91,696	152,645	2,365,754
S34 - Shan Williams 34	93,445	181,212	5,214,207	51,921	134,826	2,897,166	117,718	221,388	6,568,649	92,019	203,960	5,134,848	91,696	152,645	5,116,632
E16 - Eckel Bass	93,445	181,212	1,915,614	51,921	134,826	1,064,371	117,718	221,388	2,413,213	92,019	203,960	1,886,385	91,696	152,645	1,879,766
E17 - Eckel Bass	93,445	181,212	5,485,197	51,921	134,826	3,047,735	117,718	221,388	6,910,030	92,019	203,960	5,401,502	91,696	152,645	5,382,550
E19 - Eckel Bass	93,445	181,212	4,896,496	51,921	134,826	2,720,636	117,718	221,388	6,168,408	92,019	203,960	4,821,784	91,696	152,645	4,804,865
E18 - Eckel Bass	93,445	181,212	3,672,372	51,921	134,826	2,040,477	117,718	221,388	4,626,306	92,019	203,960	3,616,338	91,696	152,645	3,603,649
E20 -Eckel Bass	93,445	181,212	8,746,412	51,921	134,826	4,859,762	117,718	221,388	11,018,378	92,019	203,960	8,612,958	91,696	152,645	8,582,737
H37 HolHome (931)	93,445	181,212	4,289,106	51,921	134,826	2,383,152	117,718	221,388	5,403,243	92,019	203,960	4,223,662	91,696	152,645	4,208,842
H36 - Ronnie (932)	93,445	181,212	15,726,722	51,921	134,826	8,738,225	117,718	221,388	19,811,892	92,019	203,960	15,486,761	91,696	152,645	15,432,421
H38 - West Willy	93,445	181,212	5,690,775	51,921	134,826	3,161,960	117,718	221,388	7,169,009	92,019	203,960	5,603,944	91,696	152,645	5,584,281
H38 - West Willy	93,445	181,212	1,766,103	51,921	134,826	981,298	117,718	221,388	2,224,865	92,019	203,960	1,739,155	91,696	152,645	1,733,053
E35 - Eckel Bass	93,445	181,212	1,924,958	51,921	134,826	1,069,563	117,718	221,388	2,424,985	92,019	203,960	1,895,587	91,696	152,645	1,888,936
E38N (Ekel Iles N)	93,445	181,212	7,316,710	51,921	134,826	4,065,377	117,718	221,388	9,217,297	92,019	203,960	7,205,070	91,696	152,645	7,179,789
E38S (Eckel Iles S)	93,445	181,212	8,036,234	51,921	134,826	4,465,166	117,718	221,388	10,123,724	92,019	203,960	7,913,615	91,696	152,645	7,885,848
S35 - Shan 35	67,309	157,608	2,167,334	37,399	117,264	1,204,234	84,793	192,551	2,730,320	66,282	177,393	2,134,265	66,049	132,762	2,126,776
S36 - Shan 36	93,445	181,212	8,550,179	51,921	134,826	4,750,728	117,718	221,388	10,771,171	92,019	203,960	8,419,718	91,696	152,645	8,390,175
L39 Lynch	93,445	181,212	13,278,474	51,921	134,826	7,377,907	117,718	221,388	16,727,688	92,019	203,960	13,075,869	91,696	152,645	13,029,988

MAURER-STUTZ

Project Number: 23804009.1

Planned By: DNF

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2023

Fall 2022 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	1.06	0.80	4.34	2,170	0.80	0.28	1.08	18.11	220878
4089A	229	2.87	1.00	5.70	2,850	2.15	0.35	2.50	23.78	168177
4090	230	1.49	0.90	4.12	2,060	1.12	0.32	1.43	17.19	232673
4091A	231	1.75	0.40	4.51	2,255	1.31	0.14	1.45	18.82	212552
4092	232	1.08	0.40	5.01	2,505	0.81	0.14	0.95	20.91	191340

Spring 2023 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	2.47	0.70	5.29	2,645	1.85	0.25	2.10	22.07	181212
4089A	229	4.66	0.80	7.11	3,555	3.50	0.28	3.78	29.67	134826
4090	230	1.94	0.60	4.33	2,165	1.46	0.21	1.67	18.07	221388
4091A	231	2.56	0.60	4.70	2,350	1.92	0.21	2.13	19.61	203960
4092	232	2.57	0.60	6.28	3,140	1.93	0.21	2.14	26.20	152645

MAURER-STUTZ **SMITHFIELD - MT. ERIE - SPRING MANURE APPLICATION**

Project Number: 23804009.11
Planned By: DNF

CROP YEAR 2022

Field Number	2021 Crop	2022 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations		
				N	P2O5	K2O
B1 - Bailey 1	Corn Grain	Soybeans	23	196	41	62
B2 - Bailey 2	Corn Grain	Soybeans	19	196	47	72
B3 - Bailey 3	Corn Grain	Soybeans	60	196	44	68
B4 - Bailey 4	Corn Grain	Soybeans	23	196	42	64
B5 - Bailey 5	Corn Grain	Soybeans	36	196	35	53
B6 - Bailey 6	Corn Grain	Soybeans	64	196	40	61
B7 - Bailey 7	Corn Grain	Soybeans	33	196	40	61
B8 - Bailey 8	Corn Grain	Soybeans	47	196	40	61
B9 - Bailey 9	Corn Grain	Soybeans	21	196	40	61
B10 - Bailey 10	Corn Grain	Soybeans	33	196	45	69
B11 - Bailey 11	Corn Grain	Soybeans	16	196	46	70
B12 - Bailey 12	Corn Grain	Soybeans	39	196	46	70
B21 - Bailey 21	Corn Grain	Soybeans	21	196	40	61
B22A - Bailey 22A	Corn Grain	Soybeans	16	196	42	64
S24 - Shan 24	Corn Grain	Soybeans	100	196	42	64
S25 - Shan 25	Soybeans	Corn Grain	73	196	52	34
S27 - Shan 27	Corn Grain	Soybeans	105	196	42	64
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50
S29 - Shan 29	Soybeans	Corn Grain	73	196	75	49
S30 - Shan 30	Soybeans	Corn Grain	37	196	63	41
S31E - Shan 31 E	Soybeans	Corn Grain	44	196	53	34
S31W - Shan 31 W	Soybeans	Corn Grain	56	196	53	34
S32 - Shan 32	Corn Grain	Soybeans	60	196	45	69
S33 - Shan Williams 33	Soybeans	Corn Grain	26	196	32	21
S34 - Shan Williams 34	Soybeans	Corn Grain	56	196	46	30
E16 - Eckel Bass	Corn Grain	Soybeans	21	196	31	47
E17 - Eckel Bass	Corn Grain	Soybeans	59	196	43	65
E19 - Eckel Bass	Corn Grain	Soybeans	52	196	43	65
E18 - Eckel Bass	Corn Grain	Soybeans	39	196	28	43
E20 -Eckel Bass	Corn Grain	Soybeans	94	196	28	43
H37 HolHome (931)	Corn Grain	Soybeans	46	196	39	60
H36 - Ronnie (932)	Corn Grain	Soybeans	168	196	40	61
H38 - West Willy	Soybeans	Soybeans	60	196	37	57
E38E - Eckel Iles E	Corn Grain	Soybeans	19	196	26	40
E35 - Eckel Bass	Corn Grain	Soybeans	21	196	43	66
E38N (Ekel Iles N)	Corn Grain	Soybeans	78	196	26	40
E38S (Eckel Iles S)	Corn Grain	Soybeans	86	196	26	40
S35 - Shan 35	Corn Grain	Soybeans	32	196	39	60
S36 - Shan 36	Soybeans	Corn Grain	91	196	20	13
L39 Lynch	Soybeans	Corn Grain	142	196	61	40

Crop not verified, 2021 Yields not provided. Projected crops based on historical rotation

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION RECORDS
CROP YEAR 2022

Field Number	2021 Crop	2022 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Corn Grain	Soybeans	23	196	41	62	19.41	232	23.0							59	552
B2 - Bailey 2	Corn Grain	Soybeans	19	196	47	72											
B3 - Bailey 3	Corn Grain	Soybeans	45	196	44	68											
B4 - Bailey 4	Corn Grain	Soybeans	23	196	42	64											
B5 - Bailey 5	Corn Grain	Soybeans	36	196	35	53											
B6 - Bailey 6	Corn Grain	Soybeans	64	196	40	61	18.32	232	64.0							56	521
B7 - Bailey 7	Corn Grain	Soybeans	33	196	40	61	21.22	232	33.0							64	604
B8 - Bailey 8	Corn Grain	Soybeans	47	196	40	61	14.89	232	47.0							46	428
B9 - Bailey 9	Corn Grain	Soybeans	21	196	40	61											
B10 - Bailey 10	Corn Grain	Soybeans	33	196	45	69											
B11 - Bailey 11	Corn Grain	Soybeans	16	196	46	70											
B12 - Bailey 12	Corn Grain	Soybeans	39	196	46	70											
B21 - Bailey 21	Corn Grain	Soybeans	21	196	40	61											
B22A - Bailey 22A	Corn Grain	Soybeans	16	196	42	64											
S24 - Shan 24	Corn Grain	Soybeans	100	196	42	64	17.520	228	100.0	4.260	228	100.0				60	483
S25 - Shan 25	Soybeans	Corn Grain	73	196	52	34	6.050	229	73.0	7.650	229	73.0				51	358
S27 - Shan 27	Corn Grain	Soybeans	105	196	42	64	10.920	228	105.0	5.060	230	105.0				40	333
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50	13.610	229	111.0							51	356
S29 - Shan 29	Soybeans	Corn Grain	73	196	75	49											
S30 - Shan 30	Soybeans	Corn Grain	37	196	63	41	15.030	229	37.0							56	393
S31E - Shan 31 E	Soybeans	Corn Grain	44	196	53	34											
S31W - Shan 31 W	Soybeans	Corn Grain	56	196	53	34											
S32 - Shan 32	Corn Grain	Soybeans	60	196	45	69											
S33 - Shan Williams 33	Soybeans	Corn Grain	26	196	32	21											
S34 - Shan Williams 34	Soybeans	Corn Grain	56	196	46	30											
E16 - Eckel Bass	Corn Grain	Soybeans	21	196	31	47											
E17 - Eckel Bass	Corn Grain	Soybeans	59	196	43	65											
E19 - Eckel Bass	Corn Grain	Soybeans	52	196	43	65											
E18 - Eckel Bass	Corn Grain	Soybeans	39	196	28	43											
E20 -Eckel Bass	Corn Grain	Soybeans	94	196	28	43											
H37 HotHome (931)	Corn Grain	Soybeans	46	196	39	60	22.580	232	46.0	3.420	232	46.0				79	742
H36 - Ronnie (932)	Corn Grain	Soybeans	168	196	40	61											
H38 - West Willy	Soybeans	Soybeans	61	196	37	57											
E38E - Eckel Iles E	Corn Grain	Soybeans	19	196	26	40											
E35 - Eckel Bass	Corn Grain	Soybeans	21	196	43	68											
E38N (Ekel Iles N)	Corn Grain	Soybeans	78	196	26	40											
E38S (Eckel Iles S)	Corn Grain	Soybeans	86	196	26	40											
S35 - Shan 35	Corn Grain	Soybeans	32	196	39	60											
S36 - Shan 36	Corn Grain	Soybeans	92	196	40	61											
L39 Lynch	Soybeans	Corn Grain	142	196	61	40	10.700	231	142.0	7.850	231	142.0				63	425

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2022- SPRING APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	68,313	1,780,679	1,571,208	39,607	131,148	910,961	84,523	203,006	1,944,038	56,963	161,374	1,310,156	122,995	172,132	2,828,880
B2 - Bailey 2	97,634	206,597	1,864,807	56,606	152,161	1,081,184	120,801	235,531	2,307,304	81,412	187,229	1,554,974	175,785	199,711	3,357,489
B3 - Bailey 3	97,634	206,597	4,432,578	56,606	152,161	2,569,935	120,801	235,531	5,484,376	81,412	187,229	3,696,116	175,785	199,711	7,980,628
B4 - Bailey 4	97,634	206,597	2,216,289	56,606	152,161	1,284,968	120,801	235,531	2,742,188	81,412	187,229	1,848,058	175,785	199,711	3,990,314
B5 - Bailey 5	97,634	206,597	3,514,819	56,606	152,161	2,037,834	120,801	235,531	4,348,844	81,412	187,229	2,930,841	175,785	199,711	6,328,251
B6 - Bailey 6	69,960	179,670	4,491,429	40,562	132,328	2,604,056	86,561	204,833	5,557,192	58,336	162,826	3,745,189	125,959	173,681	8,086,586
B7 - Bailey 7	65,579	175,408	2,164,115	38,022	129,189	1,254,718	81,140	199,973	2,677,634	54,683	158,963	1,804,553	118,072	169,561	3,896,378
B8 - Bailey 8	74,899	184,476	3,482,822	43,425	135,868	2,019,282	92,672	210,312	4,309,255	62,455	167,182	2,904,160	134,853	178,327	6,270,642
B9 - Bailey 9	97,634	206,597	2,079,601	56,606	152,161	1,205,718	120,801	235,531	2,573,066	81,412	187,229	1,734,081	175,785	199,711	3,744,215
B10 - Bailey 10	97,634	206,597	3,173,101	56,606	152,161	1,839,711	120,801	235,531	3,926,040	81,412	187,229	2,645,898	175,785	199,711	5,713,004
B11 - Bailey 11	97,634	206,597	1,542,615	56,606	152,161	894,383	120,801	235,531	1,908,659	81,412	187,229	1,286,314	175,785	199,711	2,777,399
B12 - Bailey 12	97,634	206,597	3,827,248	56,606	152,161	2,218,975	120,801	235,531	4,735,408	81,412	187,229	3,191,360	175,785	199,711	6,890,762
B21 - Bailey 21	97,634	206,597	2,030,785	56,606	152,161	1,177,415	120,801	235,531	2,512,666	81,412	187,229	1,693,375	175,785	199,711	3,656,323
B22A - Bailey 22A	97,634	206,597	1,562,142	56,606	152,161	905,704	120,801	235,531	1,932,820	81,412	187,229	1,302,596	175,785	199,711	2,812,556
S24 - Shan 24	67,648	181,641	6,731,009	39,221	133,780	3,902,527	83,700	207,080	8,328,197	56,409	164,613	5,612,669	121,797	175,587	12,118,834
S25 - Shan 25	72,041	188,089	5,251,818	41,768	138,529	3,044,917	89,136	214,430	6,498,013	60,072	170,455	4,379,242	129,707	181,819	9,455,628
S27 - Shan 27	77,861	189,404	8,159,819	45,142	139,497	4,730,928	96,336	215,930	10,096,047	64,924	171,647	6,804,086	140,184	183,090	14,691,333
S28 - Shan 28	72,176	188,186	7,989,834	41,846	138,600	4,632,373	89,302	214,541	9,885,726	60,184	170,543	6,662,343	129,948	181,913	14,385,283
S29 - Shan 29	97,634	206,597	7,127,273	56,606	152,161	4,132,274	120,801	235,531	8,818,490	81,412	187,229	5,943,094	175,785	199,711	12,832,287
S30 - Shan 30	69,595	186,320	2,588,947	40,350	137,226	1,501,028	86,109	212,414	3,203,273	58,032	168,852	2,158,800	125,303	180,109	4,661,265
S31E - Shan 31 E	97,634	206,597	4,315,417	56,606	152,161	2,502,007	120,801	235,531	5,339,414	81,412	187,229	3,598,422	175,785	199,711	7,769,686
S31W - Shan 31 W	97,634	206,597	5,467,497	56,606	152,161	3,169,964	120,801	235,531	6,764,869	81,412	187,229	4,559,086	175,785	199,711	9,843,946
S32 - Shan 32	97,634	206,597	5,828,742	56,606	152,161	3,379,408	120,801	235,531	7,211,834	81,412	187,229	4,860,312	175,785	199,711	10,494,350
S33 - Shan Williams 33	97,634	206,597	2,518,954	56,606	152,161	1,460,448	120,801	235,531	3,116,672	81,412	187,229	2,100,436	175,785	199,711	4,535,247
S34 - Shan Williams 34	97,634	206,597	5,447,970	56,606	152,161	3,158,643	120,801	235,531	6,740,709	81,412	187,229	4,542,804	175,785	199,711	9,808,789
E16 - Eckel Bass	97,634	206,597	2,001,494	56,606	152,161	1,160,433	120,801	235,531	2,476,425	81,412	187,229	1,668,951	175,785	199,711	3,603,587
E17 - Eckel Bass	97,634	206,597	5,731,108	56,606	152,161	3,322,801	120,801	235,531	7,091,032	81,412	187,229	4,778,899	175,785	199,711	10,318,565
E19 - Eckel Bass	97,634	206,597	5,116,015	56,606	152,161	2,966,181	120,801	235,531	6,329,985	81,412	187,229	4,266,002	175,785	199,711	9,211,121
E18 - Eckel Bass	97,634	206,597	3,837,011	56,606	152,161	2,224,635	120,801	235,531	4,747,488	81,412	187,229	3,199,502	175,785	199,711	6,908,341
E20 -Eckel Bass	97,634	206,597	9,138,531	56,606	152,161	5,298,368	120,801	235,531	11,306,995	81,412	187,229	7,620,187	175,785	199,711	16,453,453
H37 HolHome (931)	58,273	168,299	2,674,735	33,786	123,953	1,550,767	72,101	191,869	3,309,418	48,591	152,521	2,230,334	104,918	162,689	4,815,722
H36 - Ronnie (932)	97,634	206,597	16,431,781	56,606	152,161	9,526,874	120,801	235,531	20,330,847	81,412	187,229	13,701,682	175,785	199,711	29,584,574
H38 - West Willy	97,634	206,597	5,945,903	56,606	152,161	3,447,336	120,801	235,531	7,356,795	81,412	187,229	4,958,006	175,785	199,711	10,705,291
H38 - West Willy	97,634	206,597	1,845,280	56,606	152,161	1,069,863	120,801	235,531	2,283,143	81,412	187,229	1,538,692	175,785	199,711	3,322,332
E35 - Eckel Bass	97,634	206,597	2,011,258	56,606	152,161	1,166,094	120,801	235,531	2,488,505	81,412	187,229	1,677,092	175,785	199,711	3,621,166
E38N (Ekel Iles N)	97,634	206,597	7,644,732	56,606	152,161	4,432,289	120,801	235,531	9,458,737	81,412	187,229	6,374,579	175,785	199,711	13,763,946
E38S (Eckel Iles S)	97,634	206,597	8,396,513	56,606	152,161	4,868,159	120,801	235,531	10,388,906	81,412	187,229	7,001,454	175,785	199,711	15,117,489
S35 - Shan 35	97,634	206,597	3,143,811	56,606	152,161	1,822,729	120,801	235,531	3,889,800	81,412	187,229	2,621,475	175,785	199,711	5,660,269
S36 - Shan 36	97,634	206,597	8,933,499	56,606	152,161	5,179,495	120,801	235,531	11,053,313	81,412	187,229	7,449,221	175,785	199,711	16,084,305
L39 Lynch	66,008	184,665	9,379,730	38,270	136,007	5,438,212	81,671	210,527	11,605,428	55,041	167,352	7,821,312	118,844	178,509	16,887,720

MAURER-STUTZ

Project Number: 23804009.1

Planned By: DNF

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2022

Spring 2021		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
Source #										
4088	228	3.48	0.40	5.29	2,645	2.61	0.14	2.75	22.07	181212
4089A	229	4.76	0.50	6.26	3,130	3.57	0.18	3.75	26.12	153133
4090	230	2.20	0.70	4.32	2,160	1.65	0.25	1.90	18.03	221901
4091A	231	3.68	1.90	5.49	2,745	2.76	0.67	3.43	22.91	174610
4092	232	3.67	0.80	6.82	3,410	2.75	0.28	3.03	28.46	140559

Spring 2022		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
Source #										
4088	228	2.35	0.70	4.64	2,320	1.76	0.25	2.01	19.36	206597
4089A	229	4.29	0.70	6.30	3,150	3.22	0.25	3.46	26.29	152161
4090	230	1.79	0.80	4.07	2,035	1.34	0.28	1.62	16.98	235531
4091A	231	2.93	0.60	5.12	2,560	2.20	0.21	2.41	21.36	187229
4092	232	1.30	0.40	4.80	2,400	0.98	0.14	1.12	20.03	199711

MAURER-STUTZ **SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION**

Project Number: 23804009.11
Planned By: DNF

CROP YEAR 2022

Field Number	2021 Crop	2022 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations		
				N	P2O5	K2O
B1 - Bailey 1	Corn Grain	Soybeans	23	196	41	62
B2 - Bailey 2	Corn Grain	Soybeans	19	196	47	72
B3 - Bailey 3	Corn Grain	Soybeans	60	196	44	68
B4 - Bailey 4	Corn Grain	Soybeans	23	196	42	64
B5 - Bailey 5	Corn Grain	Soybeans	36	196	35	53
B6 - Bailey 6	Corn Grain	Soybeans	64	196	40	61
B7 - Bailey 7	Corn Grain	Soybeans	33	196	40	61
B8 - Bailey 8	Corn Grain	Soybeans	47	196	40	61
B9 - Bailey 9	Corn Grain	Soybeans	21	196	40	61
B10 - Bailey 10	Corn Grain	Soybeans	33	196	45	69
B11 - Bailey 11	Corn Grain	Soybeans	16	196	46	70
B12 - Bailey 12	Corn Grain	Soybeans	39	196	46	70
B21 - Bailey 21	Corn Grain	Soybeans	21	196	40	61
B22A - Bailey 22A	*Corn Grain*	*Soybeans*	16	196	42	64
S24 - Shan 24	Corn Grain	Soybeans	100	196	42	64
S25 - Shan 25	Corn Grain	Soybeans	73	196	41	62
S27 - Shan 27	Corn Grain	Soybeans	105	196	42	64
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50
S29 - Shan 29	Corn Grain	Soybeans	73	196	37	56
S30 - Shan 30	Soybeans	Corn Grain	37	196	63	41
S31E - Shan 31 E	Soybeans	Corn Grain	44	196	53	34
S31W - Shan 31 W	Soybeans	Corn Grain	56	196	53	34
S32 - Shan 32	Corn Grain	Soybeans	60	196	45	69
S33 - Shan Williams 33	Soybeans	Corn Grain	26	196	32	21
S34 - Shan Williams 34	Corn Grain	Soybeans	56	196	29	44
E16 - Eckel Bass	Soybeans	Corn Grain	21	196	86	56
E17 - Eckel Bass	Soybeans	Corn Grain	59	196	76	50
E19 - Eckel Bass	Soybeans	Corn Grain	52	196	76	50
E18 - Eckel Bass	Soybeans	Corn Grain	39	196	76	50
E20 -Eckel Bass	Soybeans	Corn Grain	94	196	71	46
H37 HolHome (931)	Corn Grain	Soybeans	46	196	39	60
H36 - Ronnie (932)	Corn Grain	Soybeans	168	196	40	61
H38 - West Willy	Soybeans	Soybeans	60	196	37	57
E38E - Eckel Iles E	Corn Grain	Soybeans	19	196	26	40
E35 - Eckel Bass	Soybeans	Corn Grain	21	196	78	51
E38N (Ekel Iles N)	Corn Grain	Soybeans	78	196	26	40
E38S (Eckel Iles S)	Corn Grain	Soybeans	86	196	26	40
S35 - Shan 35	Soybeans	Corn Grain	32	196	78	51
S36 - Shan 36	Corn Grain	Soybeans	91	196	40	61
L39 Lynch	Corn Grain	Soybeans	142	196	37	56

MAURER-STUTZ

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION RECORDS
CROP YEAR 2022

Project Number: 23804009.11
Planned By: DNF

Field Number	2021 Crop	2021 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Corn Grain	Soybeans	23	196	41	62											
B2 - Bailey 2	Corn Grain	Soybeans	19	196	47	72											
B3 - Bailey 3	Corn Grain	Soybeans	45	196	44	68											
B4 - Bailey 4	Corn Grain	Soybeans	23	196	42	64											
B5 - Bailey 5	Corn Grain	Soybeans	36	196	35	53											
B6 - Bailey 6	Corn Grain	Soybeans	64	196	40	61											
B7 - Bailey 7	Corn Grain	Soybeans	33	196	40	61											
B8 - Bailey 8	Corn Grain	Soybeans	47	196	40	61											
B9 - Bailey 9	Corn Grain	Soybeans	21	196	40	61											
B10 - Bailey 10	Corn Grain	Soybeans	33	196	45	69											
B11 - Bailey 11	Corn Grain	Soybeans	16	196	46	70											
B12 - Bailey 12	Corn Grain	Soybeans	39	196	46	70											
B21 - Bailey 21	Corn Grain	Soybeans	21	196	40	61											
B22A - Bailey 22A	*Corn Grain*	*Soybeans*	16	196	42	64											
S24 - Shan 24	Corn Grain	Soybeans	100	196	42	64											
S25 - Shan 25	Corn Grain	Soybeans	73	196	41	62											
S27 - Shan 27	Corn Grain	Soybeans	105	196	42	64											
S28 - Shan 28	Soybeans	Corn Grain	111	196	76	50											
S29 - Shan 29	Corn Grain	Soybeans	73	196	37	56											
S30 - Shan 30	Soybeans	Corn Grain	37	196	63	41											
S31E - Shan 31 E	Soybeans	Corn Grain	44	196	53	34											
S31W - Shan 31 W	Soybeans	Corn Grain	56	196	53	34											
S32 - Shan 32	Corn Grain	Soybeans	60	196	45	69											
S33 - Shan Williams 33	Soybeans	Corn Grain	26	196	32	21											
S34 - Shan Williams 34	Corn Grain	Soybeans	56	196	29	44											
E16 - Eckel Bass	Soybeans	Corn Grain	21	196	86	56											
E17 - Eckel Bass	Soybeans	Corn Grain	59	196	76	50											
E19 - Eckel Bass	Soybeans	Corn Grain	52	196	76	50											
E18 - Eckel Bass	Soybeans	Corn Grain	39	196	76	50											
E20 -Eckel Bass	Soybeans	Corn Grain	94	196	71	46											
H37 HotHome (931)	Corn Grain	Soybeans	46	196	39	60											
H36 - Ronnie (932)	Corn Grain	Soybeans	168	196	40	61											
H38 - West Willy	Soybeans	Soybeans	61	196	37	57											
E38E - Eckel Iles E	Corn Grain	Soybeans	19	196	26	40											
E35 - Eckel Bass	Soybeans	Corn Grain	21	196	78	51											
E38N (Ekel Iles N)	Corn Grain	Soybeans	78	196	26	40											
E38S (Eckel Iles S)	Corn Grain	Soybeans	88	196	26	40											
S35 - Shan 35	Soybeans	Corn Grain	32	196	78	51											
S36 - Shan 36	Corn Grain	Soybeans	92	196	40	61											
L39 Lynch	Corn Grain	Soybeans	142	196	37	56											

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2022- FALL APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	71,273	1,812,120	1,639,273	52,336	153,133	1,203,738	103,430	221,901	2,378,892	57,226	174,610	1,316,204	64,633	140,559	1,486,562
B2 - Bailey 2	71,273	181,212	1,361,309	52,336	153,133	999,626	103,430	221,901	1,975,515	57,226	174,610	1,093,022	64,633	140,559	1,234,493
B3 - Bailey 3	71,273	181,212	3,235,782	52,336	153,133	2,376,075	103,430	221,901	4,695,726	57,226	174,610	2,598,073	64,633	140,559	2,934,345
B4 - Bailey 4	71,273	181,212	1,617,891	52,336	153,133	1,188,037	103,430	221,901	2,347,863	57,226	174,610	1,299,036	64,633	140,559	1,467,172
B5 - Bailey 5	71,273	181,212	2,565,818	52,336	153,133	1,884,112	103,430	221,901	3,723,483	57,226	174,610	2,060,146	64,633	140,559	2,326,793
B6 - Bailey 6	71,273	181,212	4,575,709	52,336	153,133	3,360,000	103,430	221,901	6,640,211	57,226	174,610	3,673,927	64,633	140,559	4,149,448
B7 - Bailey 7	71,273	181,212	2,352,000	52,336	153,133	1,727,103	103,430	221,901	3,413,193	57,226	174,610	1,888,467	64,633	140,559	2,132,894
B8 - Bailey 8	71,273	181,212	3,314,182	52,336	153,133	2,433,645	103,430	221,901	4,809,499	57,226	174,610	2,661,022	64,633	140,559	3,005,441
B9 - Bailey 9	71,273	181,212	1,518,109	52,336	153,133	1,114,766	103,430	221,901	2,203,061	57,226	174,610	1,218,920	64,633	140,559	1,376,686
B10 - Bailey 10	71,273	181,212	2,316,364	52,336	153,133	1,700,935	103,430	221,901	3,361,478	57,226	174,610	1,859,854	64,633	140,559	2,100,577
B11 - Bailey 11	71,273	181,212	1,126,109	52,336	153,133	826,916	103,430	221,901	1,634,195	57,226	174,610	904,175	64,633	140,559	1,021,204
B12 - Bailey 12	71,273	181,212	2,793,891	52,336	153,133	2,051,589	103,430	221,901	4,054,459	57,226	174,610	2,243,270	64,633	140,559	2,533,619
B21 - Bailey 21	71,273	181,212	1,482,473	52,336	153,133	1,088,598	103,430	221,901	2,151,346	57,226	174,610	1,190,307	64,633	140,559	1,344,369
B22A - Bailey 22A	71,273	181,212	1,140,364	52,336	153,133	837,383	103,430	221,901	1,654,881	57,226	174,610	915,620	64,633	140,559	1,034,130
S24 - Shan 24	71,273	181,212	7,091,636	52,336	153,133	5,207,477	103,430	221,901	10,291,293	57,226	174,610	5,694,015	64,633	140,559	6,430,998
S25 - Shan 25	71,273	181,212	5,195,782	52,336	153,133	3,815,327	103,430	221,901	7,540,053	57,226	174,610	4,171,796	64,633	140,559	4,711,756
S27 - Shan 27	71,273	181,212	7,469,382	52,336	153,133	5,484,860	103,430	221,901	10,839,472	57,226	174,610	5,997,314	64,633	140,559	6,773,553
S28 - Shan 28	71,273	181,212	7,889,891	52,336	153,133	5,793,645	103,430	221,901	11,449,710	57,226	174,610	6,334,949	64,633	140,559	7,154,889
S29 - Shan 29	71,273	181,212	5,202,909	52,336	153,133	3,820,561	103,430	221,901	7,550,396	57,226	174,610	4,177,518	64,633	140,559	4,718,219
S30 - Shan 30	71,273	181,212	2,651,345	52,336	153,133	1,946,916	103,430	221,901	3,847,599	57,226	174,610	2,128,818	64,633	140,559	2,404,353
S31E - Shan 31 E	71,273	181,212	3,150,255	52,336	153,133	2,313,271	103,430	221,901	4,571,609	57,226	174,610	2,529,401	64,633	140,559	2,856,785
S31W - Shan 31 W	71,273	181,212	3,991,273	52,336	153,133	2,930,841	103,430	221,901	5,792,084	57,226	174,610	3,204,672	64,633	140,559	3,619,456
S32 - Shan 32	71,273	181,212	4,254,982	52,336	153,133	3,124,486	103,430	221,901	6,174,776	57,226	174,610	3,416,409	64,633	140,559	3,858,599
S33 - Shan Williams 33	71,273	181,212	1,838,836	52,336	153,133	1,350,280	103,430	221,901	2,668,496	57,226	174,610	1,476,438	64,633	140,559	1,667,535
S34 - Shan Williams 34	71,273	181,212	3,977,018	52,336	153,133	2,920,374	103,430	221,901	5,771,398	57,226	174,610	3,193,226	64,633	140,559	3,606,529
E16 - Eckel Bass	71,273	181,212	1,461,091	52,336	153,133	1,072,897	103,430	221,901	2,120,317	57,226	174,610	1,173,139	64,633	140,559	1,324,979
E17 - Eckel Bass	71,273	181,212	4,183,709	52,336	153,133	3,072,150	103,430	221,901	6,071,346	57,226	174,610	3,359,182	64,633	140,559	3,793,965
E19 - Eckel Bass	71,273	181,212	3,734,691	52,336	153,133	2,742,430	103,430	221,901	5,419,736	57,226	174,610	2,998,657	64,633	140,559	3,386,777
E18 - Eckel Bass	71,273	181,212	2,801,018	52,336	153,133	2,056,822	103,430	221,901	4,064,802	57,226	174,610	2,248,993	64,633	140,559	2,540,082
E20 -Eckel Bass	71,273	181,212	6,671,127	52,336	153,133	4,898,692	103,430	221,901	9,681,055	57,226	174,610	5,356,380	64,633	140,559	6,049,662
H37 HolHome (931)	71,273	181,212	3,271,418	52,336	153,133	2,402,243	103,430	221,901	4,747,441	57,226	174,610	2,626,686	64,633	140,559	2,966,661
H36 - Ronnie (932)	71,273	181,212	11,995,200	52,336	153,133	8,808,224	103,430	221,901	17,407,282	57,226	174,610	9,631,182	64,633	140,559	10,877,758
H38 - West Willy	71,273	181,212	4,340,509	52,336	153,133	3,187,290	103,430	221,901	6,298,892	57,226	174,610	3,485,080	64,633	140,559	3,936,158
H38 - West Willy	71,273	181,212	1,347,055	52,336	153,133	989,159	103,430	221,901	1,954,828	57,226	174,610	1,081,577	64,633	140,559	1,221,566
E35 - Eckel Bass	71,273	181,212	1,468,218	52,336	153,133	1,078,131	103,430	221,901	2,130,680	57,226	174,610	1,178,881	64,633	140,559	1,331,443
E38N (Ekel Iles N)	71,273	181,212	5,580,655	52,336	153,133	4,097,944	103,430	221,901	8,098,575	57,226	174,610	4,480,818	64,633	140,559	5,060,775
E38S (Eckel Iles S)	71,273	181,212	6,129,455	52,336	153,133	4,500,935	103,430	221,901	8,894,987	57,226	174,610	4,921,460	64,633	140,559	5,558,450
S35 - Shan 35	71,273	181,212	2,294,982	52,336	153,133	1,685,234	103,430	221,901	3,330,449	57,226	174,610	1,842,686	64,633	140,559	2,081,187
S36 - Shan 36	71,273	181,212	6,521,455	52,336	153,133	4,788,785	103,430	221,901	9,463,852	57,226	174,610	5,236,204	64,633	140,559	5,913,932
L39 Lynch	71,273	181,212	10,127,855	52,336	153,133	7,437,009	103,430	221,901	14,697,414	57,226	174,610	8,131,854	64,633	140,559	9,184,369

MAURER-STUTZ

Project Number: 23804009.1

Planned By: DNF

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2021

Fall 2020		NH3 #/1000	Org. N	Salts		NH3	Organic	Total N	Salts #/1000	Max. Rate
Source #		Gal	#/1000 Gal	mS/cm	Salts mg/L	Available	Available	Available	gal	based on Salts
4088	228	1.62	0.28	5.29	2,645	1.21	0.10	1.31	22.07	181212
4089A	229	2.74	1.15	6.26	3,130	2.05	0.40	2.46	26.12	153133
4090	230	1.64	0.70	4.32	2,160	1.23	0.25	1.48	18.03	221901
4091A	231	2.07	0.64	5.49	2,745	1.55	0.22	1.78	22.91	174610
4092	232	3.10	0.41	6.82	3,410	2.33	0.14	2.47	28.46	140559

Spring 2021		NH3 #/1000	Org. N	Salts		NH3	Organic	Total N	Salts #/1000	Max. Rate
Source #		Gal	#/1000 Gal	mS/cm	Salts mg/L	Available	Available	Available	gal	based on Salts
4088	228	3.48	0.40	5.29	2,645	2.61	0.14	2.75	22.07	181212
4089A	229	4.76	0.50	6.26	3,130	3.57	0.18	3.75	26.12	153133
4090	230	2.20	0.70	4.32	2,160	1.65	0.25	1.90	18.03	221901
4091A	231	3.68	1.90	5.49	2,745	2.76	0.67	3.43	22.91	174610
4092	232	3.67	0.80	6.82	3,410	2.75	0.28	3.03	28.46	140559

MAURER-STUTZ SMITHFIELD - MT. ERIE - SPRING MANURE APPLICATION RECORDS

Project Number: 23804009.11
Planned By: DNF

CROP YEAR 2021

Field Number	2020 Crop	2021 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations		
				N	P2O5	K2O
B1 - Bailey 1	Soybeans	Corn Grain	23	196	62	40
B2 - Bailey 2	Soybeans	Corn Grain	19	196	65	42
B3 - Bailey 3	Soybeans	Corn Grain	45	196	65	42
B4 - Bailey 4	Soybeans	Corn Grain	23	196	21	14
B5 - Bailey 5	Soybeans	Corn Grain	36	196	18	11
B6 - Bailey 6	Soybeans	Corn Grain	64	196	20	13
B7 - Bailey 7	Soybeans	Corn Grain	33	196	20	13
B8 - Bailey 8	Soybeans	Corn Grain	47	196	20	13
B9 - Bailey 9	Soybeans	Corn Grain	21	196	20	13
B10 - Bailey 10	Soybeans	Corn Grain	33	196	65	42
B11 - Bailey 11	Soybeans	Corn Grain	16	196	65	42
B12 - Bailey 12	Soybeans	Corn Grain	39	196	65	42
B21 - Bailey 21	Soybeans	Corn Grain	21	196	20	13
B22A - Bailey 22A	Soybeans	Corn Grain	16	196	65	42
S24 - Shan 24	Soybeans	Corn Grain	100	196	21	14
S25 - Shan 25	Soybeans	Corn Grain	73	196	21	13
S27 - Shan 27	Soybeans	Corn Grain	105	196	21	14
S28 - Shan 28	Corn Grain	Soybeans	111	196	150	230
S29 - Shan 29	Soybeans	Corn Grain	73	196	18	12
S30 - Shan 30	Corn Grain	Soybeans	37	196	41	62
S31E - Shan 31 E	Corn Grain	Soybeans	44	196	105	160
S31W - Shan 31 W	Corn Grain	Soybeans	56	196	105	160
S32 - Shan 32	Soybeans	Corn Grain	60	196	23	15
S33 - Shan Williams 33	Corn Grain	Soybeans	26	196	63	96
S34 - Shan Williams 34	Soybeans	Corn Grain	56	196	15	10
E16 - Eckel Bass	Corn Grain	Soybeans	21	196	170	260
E17 - Eckel Bass	Corn Grain	Soybeans	59	196	150	230
E19 - Eckel Bass	Corn Grain	Soybeans	52	196	150	230
E18 - Eckel Bass	Corn Grain	Soybeans	39	196	150	230
E20 -Eckel Bass	Corn Grain	Soybeans	94	196	140	215
H37 HolHome (931)	Soybeans	Corn Grain	46	196	20	13
H36 - Ronnie (932)	Soybeans	Corn Grain	168	196	61	40
H38 - West Willy	Corn Grain	Soybeans	60	196	115	176
E38E - Eckel Iles E	Soybeans	Corn Grain	19	196	13	9
E35 - Eckel Bass	Corn Grain	Soybeans	21	196	154	235
E38N (Ekel Iles N)	Soybeans	Corn Grain	78	196	13	9
E38S (Eckel Iles S)	Soybeans	Corn Grain	86	196	26	40
S35 - Shan 35	Corn Grain	Soybeans	32	196	39	60
S36 - Shan 36	Fallow	Corn Grain	39	196	61	40
L39 Lynch	Soybeans	Corn Grain	142	196	18	12

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION RECORDS
CROP YEAR 2021

Field Number	2020 Crop	2021 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Corn Grain	Corn Grain	23	196	62	40											
B2 - Bailey 2	Corn Grain	Corn Grain	19	196	65	42	13.79	229	19.0							34	360
B3 - Bailey 3	Corn Grain	Corn Grain	45	196	65	42	29.22	229	45.0							72	763
B4 - Bailey 4	Soybeans	Soybeans	23	196	42	64	20.17	229	23.0							50	534
B5 - Bailey 5	Soybeans	Soybeans	36	196	35	53	13.53	228	36.0							18	299
B6 - Bailey 6	Soybeans	Soybeans	64	196	40	61	18.69	231	64.0							33	428
B7 - Bailey 7	Soybeans	Soybeans	33	196	40	61	22.12	231	33.0							39	507
B8 - Bailey 8	Soybeans	Soybeans	47	196	40	61	16.55	231	47.0							30	383
B9 - Bailey 9	Soybeans	Soybeans	21	196	40	61	14.29	231	21.0							25	327
B10 - Bailey 10	Corn Grain	Corn Grain	33	196	65	42	39.27	229	33.0							98	1,042
B11 - Bailey 11	Corn Grain	Corn Grain	16	196	65	42	42.63	231	16.0							77	989
B12 - Bailey 12	Corn Grain	Corn Grain	39	196	65	42	43.89	231	39.0							78	1,006
B21 - Bailey 21	Soybeans	Soybeans	21	196	40	61											
B22A - Bailey 22A	Corn Grain	Corn Grain	16	196	65	42	12.563	229	16.0							31	328
S24 - Shan 24	Soybeans	Soybeans	100	196	42	64	12.064	230	100.0							18	219
S25 - Shan 25	Soybeans	Soybeans	73	196	41	62	19.425	232	73.0							48	554
S27 - Shan 27	Soybeans	Soybeans	105	196	42	64	22.955	230	105.0							34	415
S28 - Shan 28	Corn Grain	Corn Grain	111	196	78	50	15.788	232	111.0							39	451
S29 - Shan 29	Soybeans	Soybeans	73	196	37	56	15.952	232	73.0							39	454
S30 - Shan 30	Soybeans	Soybeans	37	196	41	62	13.020	232	37.0							32	371
S31E - Shan 31 E	Corn Grain	Corn Grain	44	196	53	34	19.283	232	44.0							48	549
S31W - Shan 31 W	Corn Grain	Corn Grain	56	196	53	34											
S32 - Shan 32	Soybeans	Soybeans	60	196	45	69											
S33 - Shan Williams 33	Corn Grain	Corn Grain	26	196	32	21											
S34 - Shan Williams 34	Soybeans	Soybeans	56	196	29	44											
E16 - Eckel Bass	Corn Grain	Corn Grain	21	196	86	56											
E17 - Eckel Bass	Corn Grain	Corn Grain	59	196	76	50											
E19 - Eckel Bass	Corn Grain	Corn Grain	52	196	76	50											
E18 - Eckel Bass	Corn Grain	Corn Grain	39	196	76	50											
E20 -Eckel Bass	Corn Grain	Corn Grain	94	196	71	46											
H37 HolHome (931)	Soybeans	Soybeans	46	196	39	60	14.083	232	46.0							35	402
H36 - Ronnie (932)	Corn Grain	Corn Grain	168	196	61	40	17.076	228	168.0							22	377
H38 - West Willy	Corn Grain	Corn Grain	61	196	58	38	17.330	228	61.0							23	383
E38E - Eckel Iles E	Soybeans	Soybeans	19	196	26	40											
E35 - Eckel Bass	Corn Grain	Corn Grain	21	196	78	51											
E38N (Ekel Iles N)	Soybeans	Soybeans	78	196	26	40											
E38S (Eckel Iles S)	Soybeans	Soybeans	86	196	26	40											
S35 - Shan 35	Soybeans	Soybeans	32	196	39	60											
S36 - Shan 36	Corn Grain	Corn Grain	39	196	61	40											
L39 Lynch	Soybeans	Soybeans	142	196	37	56											

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2021 - FALL - SPRING APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	71,273	1,812,120	1,639,273	52,336	153,133	1,203,738	103,430	221,901	2,378,892	57,226	174,610	1,316,204	64,633	140,559	1,486,562
B2 - Bailey 2	58,957	164,893	1,126,074	43,293	139,343	826,890	85,557	201,918	1,634,144	47,338	158,886	904,147	53,464	127,901	1,021,172
B3 - Bailey 3	45,178	146,636	2,051,074	33,175	123,915	1,506,129	65,562	179,562	2,976,493	36,274	141,294	1,646,848	40,969	113,740	1,860,001
B4 - Bailey 4	53,021	157,028	1,203,568	38,934	132,696	883,795	76,943	192,287	1,746,603	42,571	151,308	966,369	48,081	121,800	1,091,447
B5 - Bailey 5	64,811	167,684	2,333,194	47,591	141,701	1,713,293	94,053	205,335	3,385,901	52,038	161,575	1,873,367	58,773	130,066	2,115,839
B6 - Bailey 6	59,196	161,817	3,800,373	43,468	136,744	2,790,661	85,904	198,151	5,515,053	47,530	155,922	3,051,394	53,681	125,515	3,446,340
B7 - Bailey 7	56,977	158,255	1,880,251	41,839	133,733	1,380,692	82,685	193,789	2,728,596	45,748	152,489	1,509,691	51,669	122,752	1,705,092
B8 - Bailey 8	60,461	163,848	2,811,415	44,397	138,460	2,064,457	87,740	200,639	4,079,889	48,545	157,879	2,257,340	54,828	127,091	2,549,510
B9 - Bailey 9	62,041	166,386	1,321,464	45,557	140,604	970,368	90,032	203,746	1,917,692	49,814	160,324	1,061,030	56,261	129,059	1,198,360
B10 - Bailey 10	35,659	134,024	1,158,915	26,185	113,257	851,005	51,748	164,117	1,681,802	28,631	129,141	930,515	32,337	103,957	1,050,953
B11 - Bailey 11	43,378	136,416	685,375	31,853	115,278	503,279	62,950	167,046	994,607	34,829	131,446	550,301	39,337	105,812	621,527
B12 - Bailey 12	42,907	135,660	1,681,971	31,507	114,639	1,235,092	62,267	166,120	2,440,854	34,451	130,717	1,350,487	38,910	105,226	1,525,283
B21 - Bailey 21	71,273	181,212	1,482,473	52,336	153,133	1,088,598	103,430	221,901	2,151,346	57,226	174,610	1,190,307	64,633	140,559	1,344,369
B22A - Bailey 22A	60,053	166,345	960,841	44,097	140,570	705,558	87,148	203,696	1,394,361	48,217	160,285	771,478	54,458	129,027	871,332
S24 - Shan 24	64,755	171,311	6,443,081	47,550	144,766	4,731,234	93,971	209,776	9,350,117	51,993	165,070	5,173,277	58,722	132,879	5,842,860
S25 - Shan 25	53,791	156,134	3,921,369	39,499	131,941	2,879,510	78,061	191,192	5,690,640	43,190	150,446	3,148,544	48,780	121,107	3,556,064
S27 - Shan 27	58,909	162,430	6,173,628	43,257	137,261	4,533,372	85,488	198,902	8,959,091	47,299	156,513	4,956,928	53,421	125,991	5,598,509
S28 - Shan 28	57,045	160,803	6,314,906	41,889	135,886	4,637,114	82,783	196,909	9,164,111	45,803	154,945	5,070,362	51,731	124,728	5,726,625
S29 - Shan 29	56,936	160,646	4,156,348	41,809	135,754	3,052,058	82,625	196,717	6,031,640	45,715	154,794	3,337,214	51,632	124,607	3,769,154
S30 - Shan 30	59,571	164,426	2,216,054	43,744	138,948	1,827,276	86,449	201,346	3,215,909	47,831	158,436	1,779,313	54,022	127,539	2,009,612
S31E - Shan 31 E	53,943	156,352	2,384,264	39,611	132,125	1,750,795	78,281	191,459	3,460,014	43,312	150,656	1,914,373	48,917	121,276	2,162,152
S31W - Shan 31 W	71,273	181,212	3,991,273	52,336	153,133	2,930,841	103,430	221,901	5,792,084	57,226	174,610	3,204,672	64,633	140,559	3,619,456
S32 - Shan 32	71,273	181,212	4,254,982	52,336	153,133	3,124,486	103,430	221,901	6,174,776	57,226	174,610	3,416,409	64,633	140,559	3,858,599
S33 - Shan Williams 33	71,273	181,212	1,838,836	52,336	153,133	1,350,280	103,430	221,901	2,668,496	57,226	174,610	1,476,438	64,633	140,559	1,667,535
S34 - Shan Williams 34	71,273	181,212	3,977,018	52,336	153,133	2,920,374	103,430	221,901	5,771,398	57,226	174,610	3,193,226	64,633	140,559	3,606,529
E16 - Eckel Bass	71,273	181,212	1,461,091	52,336	153,133	1,072,897	103,430	221,901	2,120,317	57,226	174,610	1,173,139	64,633	140,559	1,324,979
E17 - Eckel Bass	71,273	181,212	4,183,709	52,336	153,133	3,072,150	103,430	221,901	6,071,346	57,226	174,610	3,359,182	64,633	140,559	3,793,965
E19 - Eckel Bass	71,273	181,212	3,734,691	52,336	153,133	2,742,430	103,430	221,901	5,419,736	57,226	174,610	2,998,657	64,633	140,559	3,386,777
E18 - Eckel Bass	71,273	181,212	2,801,018	52,336	153,133	2,056,822	103,430	221,901	4,064,802	57,226	174,610	2,248,993	64,633	140,559	2,540,082
E20 -Eckel Bass	71,273	181,212	6,671,127	52,336	153,133	4,898,692	103,430	221,901	9,681,055	57,226	174,610	5,356,380	64,633	140,559	6,049,662
H37 HolHome (931)	58,588	163,016	2,689,209	43,022	137,757	1,974,719	85,023	199,619	3,902,545	47,042	157,078	2,159,219	53,130	126,445	2,438,689
H36 - Ronnie (932)	63,116	164,136	10,622,456	46,347	138,703	7,800,201	91,593	200,991	15,415,173	50,677	158,157	8,528,979	57,236	127,314	9,632,895
H38 - West Willy	62,981	163,854	3,835,560	46,248	138,464	2,816,499	91,398	200,645	5,566,116	50,569	157,884	3,079,647	57,114	127,095	3,478,249
E38E - Eckel Iles E	71,273	181,212	1,347,055	52,336	153,133	989,159	103,430	221,901	1,954,828	57,226	174,610	1,081,577	64,633	140,559	1,221,566
E35 - Eckel Bass	71,273	181,212	1,468,218	52,336	153,133	1,078,131	103,430	221,901	2,130,660	57,226	174,610	1,178,861	64,633	140,559	1,331,443
E38N (Ekel Iles N)	71,273	181,212	5,580,655	52,336	153,133	4,097,944	103,430	221,901	8,098,575	57,226	174,610	4,480,818	64,633	140,559	5,060,775
E38S (Eckel Iles S)	71,273	181,212	6,129,455	52,336	153,133	4,500,935	103,430	221,901	8,894,987	57,226	174,610	4,921,460	64,633	140,559	5,558,450
S35 - Shan 35	71,273	181,212	2,294,982	52,336	153,133	1,685,234	103,430	221,901	3,330,449	57,226	174,610	1,842,666	64,633	140,559	2,081,187
S36 - Shan 36	71,273	181,212	2,786,764	52,336	153,133	2,046,355	103,430	221,901	4,044,116	57,226	174,610	2,237,547	64,633	140,559	2,527,156
L39 Lynch	71,273	181,212	10,127,855	52,336	153,133	7,437,009	103,430	221,901	14,697,414	57,226	174,610	8,131,854	64,633	140,559	9,184,369

MAURER-STUTZ

Project Number: 23804009.1

Planned By: DNF

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2021

Fall 2020 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	1.62	0.28	5.29	2,645	1.21	0.10	1.31	22.07	181212
4089A	229	2.74	1.15	6.26	3,130	2.05	0.40	2.46	26.12	153133
4090	230	1.64	0.70	4.32	2,160	1.23	0.25	1.48	18.03	221901
4091A	231	2.07	0.64	5.49	2,745	1.55	0.22	1.78	22.91	174610
4092	232	3.10	0.41	6.82	3,410	2.33	0.14	2.47	28.46	140559

Spring 2021 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	3.48	0.40	5.29	2,645	2.61	0.14	2.75	22.07	181212
4089A	229	4.76	0.50	6.26	3,130	3.57	0.18	3.75	26.12	153133
4090	230	2.20	0.70	4.32	2,160	1.65	0.25	1.90	18.03	221901
4091A	231	3.68	1.90	5.49	2,745	2.76	0.67	3.43	22.91	174610
4092	232	3.67	0.80	6.82	3,410	2.75	0.28	3.03	28.46	140559

MAURER-STUTZ SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION RECORDS

Project Number: 23804009.11
Planned By: DNF

CROP YEAR 2021

Field Number	2020 Crop	2021 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations		
				N	P2O5	K2O
B1 - Bailey 1	Corn Grain	Corn Grain	23	196	21	13
B2 - Bailey 2	Corn Grain	Corn Grain	19	196	24	15
B3 - Bailey 3	Corn Grain	Corn Grain	45	196	22	15
B4 - Bailey 4	Soybeans	Soybeans	23	196	77	118
B5 - Bailey 5	Soybeans	Soybeans	36	196	106	163
B6 - Bailey 6	Soybeans	Soybeans	64	196	116	177
B7 - Bailey 7	Soybeans	Soybeans	33	196	116	177
B8 - Bailey 8	Soybeans	Soybeans	47	196	116	177
B9 - Bailey 9	Soybeans	Soybeans	21	196	116	177
B10 - Bailey 10	Corn Grain	Corn Grain	33	196	23	15
B11 - Bailey 11	Corn Grain	Corn Grain	16	196	23	15
B12 - Bailey 12	Corn Grain	Corn Grain	39	196	23	15
B21 - Bailey 21	Soybeans	Soybeans	21	196	106	163
B22A - Bailey 22A	Corn Grain	Corn Grain	16	196	21	14
S24 - Shan 24	Soybeans	Soybeans	100	196	108	165
S25 - Shan 25	Soybeans	Soybeans	73	196	104	159
S27 - Shan 27	Soybeans	Soybeans	105	196	111	170
S28 - Shan 28	Corn Grain	Corn Grain	111	196	20	13
S29 - Shan 29	Soybeans	Soybeans	73	196	128	196
S30 - Shan 30	Soybeans	Soybeans	37	196	124	190
S31E - Shan 31 E	Corn Grain	Corn Grain	44	196	21	14
S31W - Shan 31 W	Corn Grain	Corn Grain	56	196	21	14
S32 - Shan 32	Soybeans	Soybeans	60	196	124	190
S33 - Shan Williams 33	Corn Grain	Corn Grain	26	196	19	12
S34 - Shan Williams 34	Soybeans	Soybeans	56	196	90	138
E16 - Eckel Bass	Corn Grain	Corn Grain	21	196	15	10
E17 - Eckel Bass	Corn Grain	Corn Grain	59	196	22	14
E19 - Eckel Bass	Corn Grain	Corn Grain	52	196	22	14
E18 - Eckel Bass	Corn Grain	Corn Grain	39	196	14	9
E20 -Eckel Bass	Corn Grain	Corn Grain	94	196	14	9
H37 HolHome (931)	Soybeans	Soybeans	46	196	122	187
H36 - Ronnie (932)	Corn Grain	Corn Grain	168	196	20	13
E38E - Eckel Iles E	Soybeans	Soybeans	19	196	166	254
E35 - Eckel Bass	Corn Grain	Corn Grain	21	196	22	14
E38N (Ekel Iles N)	Soybeans	Soybeans	78	196	166	254
E38S (Eckel Iles S)	Soybeans	Soybeans	86	196	26	40
S35 - Shan 35	Soybeans	Soybeans	32	196	154	235
S36 - Shan 36	Corn Grain	Corn Grain	39	196	20	13
L39 Lynch	Soybeans	Soybeans	142	196	122	186

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2021 - FALL - SPRING APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	149,212			79,803			132,577			110,289			79,304		
B2 - Bailey 2	149,212			79,803			132,577			110,289			79,304		
B3 - Bailey 3	149,212			79,803			132,577			110,289			79,304		
B4 - Bailey 4	149,212			79,803			132,577			110,289			79,304		
B5 - Bailey 5	149,212			79,803			132,577			110,289			79,304		
B6 - Bailey 6	149,212			79,803			132,577			110,289			79,304		
B7 - Bailey 7	149,212			79,803			132,577			110,289			79,304		
B8 - Bailey 8	149,212			79,803			132,577			110,289			79,304		
B9 - Bailey 9	149,212			79,803			132,577			110,289			79,304		
B10 - Bailey 10	149,212			79,803			132,577			110,289			79,304		
B11 - Bailey 11	149,212			79,803			132,577			110,289			79,304		
B12 - Bailey 12	149,212			79,803			132,577			110,289			79,304		
B21 - Bailey 21	149,212			79,803			132,577			110,289			79,304		
B22A - Bailey 22A	149,212			79,803			132,577			110,289			79,304		
S24 - Shan 24	149,212			79,803			132,577			110,289			79,304		
S25 - Shan 25	149,212			79,803			132,577			110,289			79,304		
S27 - Shan 27	149,212			79,803			132,577			110,289			79,304		
S28 - Shan 28	149,212			79,803			132,577			110,289			79,304		
S29 - Shan 29	149,212			79,803			132,577			110,289			79,304		
S30 - Shan 30	149,212			79,803			132,577			110,289			79,304		
S31E - Shan 31 E	149,212			79,803			132,577			110,289			79,304		
S31W - Shan 31 W	149,212			79,803			132,577			110,289			79,304		
S32 - Shan 32	149,212			79,803			132,577			110,289			79,304		
S33 - Shan Williams 33	149,212			79,803			132,577			110,289			79,304		
S34 - Shan Williams 34	149,212			79,803			132,577			110,289			79,304		
E16 - Eckel Bass	149,212			79,803			132,577			110,289			79,304		
E17 - Eckel Bass	149,212			79,803			132,577			110,289			79,304		
E19 - Eckel Bass	149,212			79,803			132,577			110,289			79,304		
E18 - Eckel Bass	149,212			79,803			132,577			110,289			79,304		
E20 -Eckel Bass	149,212			79,803			132,577			110,289			79,304		
H37 HolHome (931)	149,212			79,803			132,577			110,289			79,304		
H36 - Ronnie (932)	149,212			79,803			132,577			110,289			79,304		
E38E - Eckel Iles E	149,212			79,803			132,577			110,289			79,304		
E35 - Eckel Bass	149,212			79,803			132,577			110,289			79,304		
E38N (Ekel Iles N)	149,212			79,803			132,577			110,289			79,304		
E38S (Eckel Iles S)	149,212			79,803			132,577			110,289			79,304		
S35 - Shan 35	149,212			79,803			132,577			110,289			79,304		
S36 - Shan 36	149,212			79,803			132,577			110,289			79,304		
L39 Lynch	149,212			79,803			132,577			110,289			79,304		

MAURER-STUTZ

Project Number: 23804009.1

Planned By: DNF

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2021

Spring 2019 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	2.48	0.50	4.78	2,390	1.86	0.18	2.04	19.95	200546
4089A	229	3.19	0.60	5.05	2,525	2.39	0.21	2.60	21.07	189824
4090	230	1.70	0.70	4.34	2,170	1.28	0.25	1.52	18.11	220878
4091A	231	3.19	0.50	5.56	2,780	2.39	0.18	2.57	23.20	172412
4092	232	3.22	0.80	7.30	3,650	2.42	0.28	2.70	30.46	131317

Fall 2020 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	228	1.62	0.28	N/A		1.21	0.10	1.31		
4089A	229	2.74	1.15	N/A		2.05	0.40	2.46		
4090	230	1.64	0.70	N/A		1.23	0.25	1.48		
4091A	231	2.07	0.64	N/A		1.55	0.22	1.78		
4092	232	3.10	0.41	N/A		2.33	0.14	2.47		

MAURER-STUTZ SMITHFIELD - MT. ERIE - SPRING MANURE APPLICATION RECORDS

Project Number: 23804009.11
Planned By: DNF

CROP YEAR 2020

Field Number	2019 Crop	2020 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations		
				N	P2O5	K2O
B1 - Bailey 1	Soybeans	Corn Grain	23	196	62	40
B2 - Bailey 2	Soybeans	Corn Grain	19	196	65	42
B3 - Bailey 3	Soybeans	Corn Grain	45	196	65	42
B4 - Bailey 4	Corn Grain	Soybeans	23	196	36	56
B5 - Bailey 5	Corn Grain	Soybeans	36	196	34	52
B6 - Bailey 6	Corn Grain	Soybeans	64	196	32	49
B7 - Bailey 7	Corn Grain	Soybeans	33	196	32	49
B8 - Bailey 8	Corn Grain	Soybeans	47	196	32	49
B9 - Bailey 9	Corn Grain	Soybeans	21	196	32	49
B10 - Bailey 10	Soybeans	Corn Grain	33	196	65	42
B11 - Bailey 11	Soybeans	Corn Grain	16	196	65	42
B12 - Bailey 12	Soybeans	Corn Grain	39	196	65	42
B21 - Bailey 21	Corn Grain	Soybeans	21	196	39	59
B22A - Bailey 22A	Soybeans	Corn Grain	16	196	65	42
S24 - Shan 24	Corn Grain	Soybeans	100	196	41	63
S25 - Shan 25	Corn Grain	Soybeans	73	196	41	62
S27 - Shan 27	Corn Grain	Soybeans	105	196	40	62
S28 - Shan 28	Soybeans	Corn Grain	111	196	66	43
S29 - Shan 29	Corn Grain	Soybeans	73	196	36	55
S30 - Shan 30	Corn Grain	Soybeans	37	196	41	62
S31E - Shan 31 E	Soybeans	Corn Grain	44	196	53	34
S31W - Shan 31 W	Soybeans	Corn Grain	56	196	53	34
S32 - Shan 32	Corn Grain	Soybeans	60	196	45	69
S33 - Shan Williams 33	Soybeans	Corn Grain	26	196	32	21
S34 - Shan Williams 34	Corn Grain	Soybeans	56	196	29	44
E16 - Eckel Bass	Soybeans	Corn Grain	21	196	86	56
E17 - Eckel Bass	Soybeans	Corn Grain	59	196	86	56
E19 - Eckel Bass	Soybeans	Corn Grain	52	196	86	56
E18 - Eckel Bass	Soybeans	Corn Grain	39	196	82	53
E20 -Eckel Bass	Soybeans	Corn Grain	94	196	71	46
H37 HolHome (931)	Corn Grain	Soybeans	46	196	43	65
H36 - Ronnie (932)	Soybeans	Corn Grain	168	196	61	40
E38E - Eckel Iles E	Corn Grain	Soybeans	19	196	26	40
E35 - Eckel Bass	Soybeans	Corn Grain	21	196	79	52
E38N (Ekel Iles N)	Corn Grain	Soybeans	78	196	26	40
E38S (Eckel Iles S)	Corn Grain	Soybeans	86	196	26	40
S35 - Shan 35	Corn Grain	Soybeans	32	196	39	60
S36 - Shan 36	Fallow	Corn Grain	39	196	61	40
L39 Lynch	Corn Grain	Soybeans	142	196	37	57

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2020 - SPRING APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	75,228	200,546	1,730,253	58,749	189,824	1,351,238	102,564	220,878	2,358,974	59,372	172,412	1,365,564	57,050	131,317	1,312,143
B2 - Bailey 2	75,228	200,546	1,436,862	58,749	189,824	1,122,115	102,564	220,878	1,958,974	59,372	172,412	1,134,012	57,050	131,317	1,089,650
B3 - Bailey 3	75,228	200,546	3,415,368	58,749	189,824	2,667,226	102,564	220,878	4,656,410	59,372	172,412	2,695,505	57,050	131,317	2,590,057
B4 - Bailey 4	75,228	200,546	1,707,684	58,749	189,824	1,333,613	102,564	220,878	2,328,205	59,372	172,412	1,347,752	57,050	131,317	1,295,029
B5 - Bailey 5	75,228	200,546	2,708,221	58,749	189,824	2,114,981	102,564	220,878	3,692,308	59,372	172,412	2,137,405	57,050	131,317	2,053,790
B6 - Bailey 6	75,228	200,546	4,829,661	58,749	189,824	3,771,716	102,564	220,878	6,584,615	59,372	172,412	3,811,705	57,050	131,317	3,662,592
B7 - Bailey 7	75,228	200,546	2,482,536	58,749	189,824	1,938,733	102,564	220,878	3,384,615	59,372	172,412	1,959,288	57,050	131,317	1,882,641
B8 - Bailey 8	75,228	200,546	3,498,119	58,749	189,824	2,731,851	102,564	220,878	4,769,231	59,372	172,412	2,760,814	57,050	131,317	2,652,812
B9 - Bailey 9	75,228	200,546	1,602,364	58,749	189,824	1,251,364	102,564	220,878	2,184,615	59,372	172,412	1,264,631	57,050	131,317	1,215,159
B10 - Bailey 10	75,228	200,546	2,444,922	58,749	189,824	1,909,358	102,564	220,878	3,333,333	59,372	172,412	1,929,601	57,050	131,317	1,854,116
B11 - Bailey 11	75,228	200,546	1,188,608	58,749	189,824	928,242	102,564	220,878	1,620,513	59,372	172,412	938,083	57,050	131,317	901,385
B12 - Bailey 12	75,228	200,546	2,948,952	58,749	189,824	2,302,979	102,564	220,878	4,020,513	59,372	172,412	2,327,396	57,050	131,317	2,236,349
B21 - Bailey 21	75,228	200,546	1,564,750	58,749	189,824	1,221,989	102,564	220,878	2,133,333	59,372	172,412	1,234,945	57,050	131,317	1,186,634
B22A - Bailey 22A	75,228	200,546	1,203,654	58,749	189,824	939,992	102,564	220,878	1,641,026	59,372	172,412	949,958	57,050	131,317	912,795
S24 - Shan 24	75,228	200,546	7,485,223	58,749	189,824	5,845,573	102,564	220,878	10,205,128	59,372	172,412	5,907,549	57,050	131,317	5,676,447
S25 - Shan 25	75,228	200,546	5,484,148	58,749	189,824	4,282,837	102,564	220,878	7,476,923	59,372	172,412	4,328,244	57,050	131,317	4,158,924
S27 - Shan 27	75,228	200,546	7,883,933	58,749	189,824	6,156,945	102,564	220,878	10,748,718	59,372	172,412	6,222,222	57,050	131,317	5,978,810
S28 - Shan 28	75,228	200,546	8,327,781	58,749	189,824	6,503,567	102,564	220,878	11,353,846	59,372	172,412	6,572,519	57,050	131,317	6,315,403
S29 - Shan 29	75,228	200,546	5,491,671	58,749	189,824	4,288,712	102,564	220,878	7,487,179	59,372	172,412	4,334,182	57,050	131,317	4,164,629
S30 - Shan 30	75,228	200,546	2,798,495	58,749	189,824	2,185,480	102,564	220,878	3,815,385	59,372	172,412	2,208,651	57,050	131,317	2,122,249
S31E - Shan 31 E	75,228	200,546	3,325,094	58,749	189,824	2,596,727	102,564	220,878	4,533,333	59,372	172,412	2,624,258	57,050	131,317	2,521,597
S31W - Shan 31 W	75,228	200,546	4,212,789	58,749	189,824	3,289,971	102,564	220,878	5,743,590	59,372	172,412	3,324,852	57,050	131,317	3,194,784
S32 - Shan 32	75,228	200,546	4,491,134	58,749	189,824	3,507,344	102,564	220,878	6,123,077	59,372	172,412	3,544,529	57,050	131,317	3,405,868
S33 - Shan Williams 33	75,228	200,546	1,940,892	58,749	189,824	1,515,736	102,564	220,878	2,646,154	59,372	172,412	1,531,807	57,050	131,317	1,471,883
S34 - Shan Williams 34	75,228	200,546	4,197,743	58,749	189,824	3,278,221	102,564	220,878	5,723,077	59,372	172,412	3,312,977	57,050	131,317	3,183,374
E16 - Eckel Bass	75,228	200,546	1,542,182	58,749	189,824	1,204,364	102,564	220,878	2,102,564	59,372	172,412	1,217,133	57,050	131,317	1,169,519
E17 - Eckel Bass	75,228	200,546	4,415,905	58,749	189,824	3,448,594	102,564	220,878	6,020,513	59,372	172,412	3,485,157	57,050	131,317	3,348,818
E19 - Eckel Bass	75,228	200,546	3,941,967	58,749	189,824	3,078,473	102,564	220,878	5,374,359	59,372	172,412	3,111,111	57,050	131,317	2,989,405
E18 - Eckel Bass	75,228	200,546	2,956,475	58,749	189,824	2,308,854	102,564	220,878	4,030,769	59,372	172,412	2,333,333	57,050	131,317	2,242,054
E20 -Eckel Bass	75,228	200,546	7,041,376	58,749	189,824	5,498,951	102,564	220,878	9,600,000	59,372	172,412	5,557,252	57,050	131,317	5,339,853
H37 HolHome (931)	75,228	200,546	3,452,982	58,749	189,824	2,696,601	102,564	220,878	4,707,692	59,372	172,412	2,725,191	57,050	131,317	2,618,582
H36 - Ronnie (932)	75,228	200,546	12,660,935	58,749	189,824	9,887,537	102,564	220,878	17,261,538	59,372	172,412	9,992,366	57,050	131,317	9,601,467
E38E - Eckel Iles E	75,228	200,546	1,421,816	58,749	189,824	1,110,365	102,564	220,878	1,938,462	59,372	172,412	1,122,137	57,050	131,317	1,078,240
E35 - Eckel Bass	75,228	200,546	1,549,704	58,749	189,824	1,210,239	102,564	220,878	2,112,821	59,372	172,412	1,223,070	57,050	131,317	1,175,224
E38N (Ekel Iles N)	75,228	200,546	5,890,382	58,749	189,824	4,600,084	102,564	220,878	8,030,769	59,372	172,412	4,648,855	57,050	131,317	4,466,993
E38S (Eckel Iles S)	75,228	200,546	6,469,640	58,749	189,824	5,052,455	102,564	220,878	8,820,513	59,372	172,412	5,106,022	57,050	131,317	4,906,275
S35 - Shan 35	75,228	200,546	2,422,354	58,749	189,824	1,891,733	102,564	220,878	3,302,564	59,372	172,412	1,911,790	57,050	131,317	1,837,001
S36 - Shan 36	75,228	200,546	2,941,429	58,749	189,824	2,297,104	102,564	220,878	4,010,256	59,372	172,412	2,321,459	57,050	131,317	2,230,644
L39 Lynch	75,228	200,546	10,689,952	58,749	189,824	8,348,300	102,564	220,878	14,574,359	59,372	172,412	8,436,811	57,050	131,317	8,106,764

MAURER-STUTZ

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION RECORDS
CROP YEAR 2019

Project Number: 23804009.11
Planned By: DNF

Field Number	2018 Crop	2019 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Soybeans	Corn Grain	23	196	70	45											
B2 - Bailey 2	Soybeans	Corn Grain	19	196	71	46											
B3 - Bailey 3	Soybeans	Corn Grain	45	196	71	46											
B4 - Bailey 4	Corn Grain	Soybeans	23	196	36	56											
B5 - Bailey 5	Soybeans	Corn Grain	36	196	54	35											
B6 - Bailey 6	Corn Grain	Soybeans	64	196	32	49											
B7 - Bailey 7	Corn Grain	Soybeans	33	196	32	49											
B8 - Bailey 8	Corn Grain	Soybeans	47	196	32	49											
B9 - Bailey 9	Corn Grain	Soybeans	21	196	32	49											
B10 - Bailey 10	Soybeans	Corn Grain	33	196	71	46											
B11 - Bailey 11	Soybeans	Corn Grain	16	196	71	46											
B12 - Bailey 12	Soybeans	Corn Grain	39	196	71	46											
B21 - Bailey 21	Soybeans	Corn Grain	21	196	54	35											
B22A - Bailey 22A	Soybeans	Corn Grain	16	196	71	46											
S24 - Shan 24	Soybeans	Corn Grain	100	196	66	43											
S25 - Shan 25	Soybeans	Corn Grain	73	196	69	45											
S27 - Shan 27	Soybeans	Corn Grain	105	196	70	46											
S28 - Shan 28	Corn Grain	Soybeans	111	196	42	64											
S29 - Shan 29	Soybeans	Corn Grain	73	196	49	32											
S30 - Shan 30	Soybeans	Corn Grain	37	196	67	44											
S31E - Shan 31 E	Corn Grain	Soybeans	44	196	42	64											
S31W - Shan 31 W	Corn Grain	Soybeans	56	196	42	64											
S32 - Shan 32	Soybeans	Corn Grain	60	196	69	45											
S33 - Shan Williams 33	Corn Grain	Soybeans	26	196	40	61											
S34 - Shan Williams 34	Soybeans	Corn Grain	56	196	46	30											
E16 - Eckel Bass	Corn Grain	Soybeans	21	196	31	47											
E17 - Eckel Bass	Corn Grain	Soybeans	59	196	31	47											
E19 - Eckel Bass	Corn Grain	Soybeans	52	196	31	47											
E18 - Eckel Bass	Corn Grain	Soybeans	39	196	28	43											
E20 -Eckel Bass	Corn Grain	Soybeans	94	196	28	43											
H37 HolHome (931)	Soybeans	Corn Grain	46	196	70	45											
H36 - Ronnie (932)	Soybeans	Corn Grain	168	196	62	41											
E38E - Eckel Iles E	Soybeans	Corn Grain	19	196	84	55											
E35 - Eckel Bass	Corn Grain	Soybeans	21	196	28	43											
E38N (Ekel Iles N)	Soybeans	Corn Grain	78	196	84	55											
E38S (Eckel Iles S)	Soybeans	Corn Grain	86	196	84	55											
L39 Lynch	Soybeans	Corn Grain	142	196	58	38											

MAURER-STUTZ

Project Number: 23804009.11
Planned By: DNF

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2019 - SPRING APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	75,228	200,546	1,730,253	58,749	189,824	1,351,238	102,564	220,878	2,358,974	59,372	172,412	1,365,564	57,050	131,317	1,312,143
B2 - Bailey 2	75,228	200,546	1,436,862	58,749	189,824	1,122,115	102,564	220,878	1,958,974	59,372	172,412	1,134,012	57,050	131,317	1,089,650
B3 - Bailey 3	75,228	200,546	3,415,368	58,749	189,824	2,667,226	102,564	220,878	4,656,410	59,372	172,412	2,695,505	57,050	131,317	2,590,057
B4 - Bailey 4	75,228	200,546	1,707,684	58,749	189,824	1,333,613	102,564	220,878	2,378,205	59,372	172,412	1,347,752	57,050	131,317	1,295,029
B5 - Bailey 5	75,228	200,546	2,708,221	58,749	189,824	2,114,981	102,564	220,878	3,692,308	59,372	172,412	2,137,405	57,050	131,317	2,053,790
B6 - Bailey 6	75,228	200,546	4,829,661	58,749	189,824	3,771,716	102,564	220,878	6,584,615	59,372	172,412	3,811,705	57,050	131,317	3,662,592
B7 - Bailey 7	75,228	200,546	2,482,536	58,749	189,824	1,938,733	102,564	220,878	3,384,615	59,372	172,412	1,959,283	57,050	131,317	1,882,641
B8 - Bailey 8	75,228	200,546	3,498,119	58,749	189,824	2,731,851	102,564	220,878	4,769,231	59,372	172,412	2,760,814	57,050	131,317	2,652,812
B9 - Bailey 9	75,228	200,546	1,602,364	58,749	189,824	1,251,364	102,564	220,878	2,184,615	59,372	172,412	1,264,631	57,050	131,317	1,215,159
B10 - Bailey 10	75,228	200,546	2,444,922	58,749	189,824	1,909,358	102,564	220,878	3,333,333	59,372	172,412	1,929,601	57,050	131,317	1,854,116
B11 - Bailey 11	75,228	200,546	1,188,608	58,749	189,824	928,242	102,564	220,878	1,620,513	59,372	172,412	938,083	57,050	131,317	901,385
B12 - Bailey 12	75,228	200,546	2,948,952	58,749	189,824	2,302,979	102,564	220,878	4,020,513	59,372	172,412	2,327,396	57,050	131,317	2,236,349
B21 - Bailey 21	75,228	200,546	1,564,750	58,749	189,824	1,221,989	102,564	220,878	2,133,333	59,372	172,412	1,234,945	57,050	131,317	1,186,634
B22A - Bailey 22A	75,228	200,546	1,203,654	58,749	189,824	939,992	102,564	220,878	1,641,026	59,372	172,412	949,958	57,050	131,317	912,795
S24 - Shan 24	75,228	200,546	7,485,223	58,749	189,824	5,845,573	102,564	220,878	10,205,128	59,372	172,412	5,907,549	57,050	131,317	5,676,447
S25 - Shan 25	75,228	200,546	5,484,148	58,749	189,824	4,282,837	102,564	220,878	7,476,923	59,372	172,412	4,328,244	57,050	131,317	4,158,924
S27 - Shan 27	75,228	200,546	7,883,933	58,749	189,824	6,156,945	102,564	220,878	10,748,718	59,372	172,412	6,222,222	57,050	131,317	5,978,810
S28 - Shan 28	75,228	200,546	8,327,781	58,749	189,824	6,503,567	102,564	220,878	11,353,846	59,372	172,412	6,572,519	57,050	131,317	6,315,403
S29 - Shan 29	75,228	200,546	5,491,671	58,749	189,824	4,288,712	102,564	220,878	7,487,179	59,372	172,412	4,334,182	57,050	131,317	4,164,629
S30 - Shan 30	75,228	200,546	2,798,495	58,749	189,824	2,185,480	102,564	220,878	3,815,385	59,372	172,412	2,208,651	57,050	131,317	2,122,249
S31E - Shan 31 E	75,228	200,546	3,325,094	58,749	189,824	2,596,727	102,564	220,878	4,533,333	59,372	172,412	2,624,258	57,050	131,317	2,521,597
S31W - Shan 31 W	75,228	200,546	4,212,789	58,749	189,824	3,289,971	102,564	220,878	5,743,590	59,372	172,412	3,324,852	57,050	131,317	3,194,784
S32 - Shan 32	75,228	200,546	4,491,134	58,749	189,824	3,507,344	102,564	220,878	6,123,077	59,372	172,412	3,544,529	57,050	131,317	3,405,868
S33 - Shan Williams 33	75,228	200,546	1,940,892	58,749	189,824	1,515,736	102,564	220,878	2,646,154	59,372	172,412	1,531,807	57,050	131,317	1,471,883
S34 - Shan Williams 34	75,228	200,546	4,197,743	58,749	189,824	3,278,221	102,564	220,878	5,723,077	59,372	172,412	3,312,977	57,050	131,317	3,183,374
E16 - Eckel Bass	75,228	200,546	1,542,182	58,749	189,824	1,204,364	102,564	220,878	2,102,564	59,372	172,412	1,217,133	57,050	131,317	1,169,519
E17 - Eckel Bass	75,228	200,546	4,415,905	58,749	189,824	3,448,594	102,564	220,878	6,020,513	59,372	172,412	3,485,157	57,050	131,317	3,348,818
E19 - Eckel Bass	75,228	200,546	3,941,967	58,749	189,824	3,078,473	102,564	220,878	5,374,359	59,372	172,412	3,111,111	57,050	131,317	2,989,405
E18 - Eckel Bass	75,228	200,546	2,956,475	58,749	189,824	2,308,854	102,564	220,878	4,030,769	59,372	172,412	2,333,333	57,050	131,317	2,242,054
E20 -Eckel Bass	75,228	200,546	7,041,376	58,749	189,824	5,498,951	102,564	220,878	9,600,000	59,372	172,412	5,557,252	57,050	131,317	5,339,853
H37 HolHome (931)	75,228	200,546	3,452,982	58,749	189,824	2,696,601	102,564	220,878	4,707,692	59,372	172,412	2,725,191	57,050	131,317	2,618,582
H36 - Ronnie (932)	75,228	200,546	12,660,935	58,749	189,824	9,887,537	102,564	220,878	17,261,538	59,372	172,412	9,992,366	57,050	131,317	9,601,467
E38E - Eckel Iles E	75,228	200,546	1,421,816	58,749	189,824	1,110,365	102,564	220,878	1,938,462	59,372	172,412	1,122,137	57,050	131,317	1,078,240
E35 - Eckel Bass	75,228	200,546	1,549,704	58,749	189,824	1,210,239	102,564	220,878	2,112,821	59,372	172,412	1,223,070	57,050	131,317	1,175,224
E38N (Ekel Iles N)	75,228	200,546	5,890,382	58,749	189,824	4,600,084	102,564	220,878	8,030,769	59,372	172,412	4,648,855	57,050	131,317	4,466,993
E38S (Eckel Iles S)	75,228	200,546	6,469,640	58,749	189,824	5,052,455	102,564	220,878	8,820,513	59,372	172,412	5,106,022	57,050	131,317	4,906,275
L39 Lynch	75,228	200,546	10,689,952	58,749	189,824	8,348,300	102,564	220,878	14,574,359	59,372	172,412	8,436,811	57,050	131,317	8,106,764

MAURER-STUTZ

SMITHFIELD - MT. ERIE - FALL MANURE APPLICATION RECORDS
CROP YEAR 2018

Project Number: 23804009.11
Planned By: GCB

Field Number	2017 Crop	2018 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Soybeans	Soybeans	23	196	43	65											
B2 - Bailey 2	Corn Grain	Soybeans	19	196	31	47											
B3 - Bailey 3	Corn Grain	Soybeans	45	196	31	48											
B4 - Bailey 4	Corn Grain	Corn Grain	23	196	77	50											
B5 - Bailey 5	Corn Grain	Soybeans	36	196	32	49	14.50	201	36.0							81	289
B6 - Bailey 6	Soybeans	Corn Grain	64	196	70	46	17.00	602	64.0							54	254
B7 - Bailey 7	Soybeans	Corn Grain	33	196	70	46	24.00	601 A	33.0							19	480
B8 - Bailey 8	Soybeans	Corn Grain	47	196	70	46	32.30	601 A	47.0							26	653
B9 - Bailey 9	Soybeans	Corn Grain	21	196	70	46	17.00	202 A	21.0							47	221
B10 - Bailey 10	Corn Grain	Soybeans	33	196	31	48	29.40	202 A	33.0							82	387
B11 - Bailey 11	Corn Grain	Soybeans	16	196	31	47	24.00	202 A	16.0							67	315
B12 - Bailey 12	Corn Grain	Soybeans	39	196	31	47											
B21 - Bailey 21	Corn Grain	Soybeans	21	196	34	52	35.90	201	21.0							204	721
B22A - Bailey 22A	Corn Grain	Soybeans	16	196	32	49											

MAURER-STUTZ

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2018 - SPRING APPLICATION

Project Number: 23804009.11
Planned By: GCB

Field Number	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	61,674	200,967	1,418,502	47,741	308,235	1,098,039	75,614	302,401	1,739,130	53,060	200,128	1,220,390	46,988	267,769	1,080,718
B2 - Bailey 2	61,674	200,967	1,177,974	47,741	308,235	911,850	75,614	302,401	1,444,234	53,060	200,128	1,013,455	46,988	267,769	897,466
B3 - Bailey 3	61,674	200,967	2,800,000	47,741	308,235	2,167,434	75,614	302,401	3,432,892	53,060	200,128	2,408,944	46,988	267,769	2,133,244
B4 - Bailey 4	61,674	200,967	1,400,000	47,741	308,235	1,083,717	75,614	302,401	1,716,446	53,060	200,128	1,204,472	46,988	267,769	1,066,622
B5 - Bailey 5	36,040	186,467	1,297,451	27,898	285,996	1,004,336	44,187	280,582	1,590,718	31,007	185,688	1,116,246	27,458	248,449	988,493
B6 - Bailey 6	44,652	188,208	2,866,629	34,564	288,666	2,219,010	54,744	283,202	3,514,582	38,415	187,422	2,466,268	34,019	250,769	2,184,007
B7 - Bailey 7	55,764	176,866	1,840,208	43,166	271,271	1,424,475	68,358	266,136	2,256,156	47,976	176,128	1,583,200	42,485	235,657	1,402,004
B8 - Bailey 8	53,634	168,183	2,494,001	41,518	257,952	1,930,565	65,758	253,070	3,057,727	46,144	167,480	2,145,682	40,863	224,087	1,900,111
B9 - Bailey 9	46,966	189,883	1,000,368	36,355	291,235	774,368	57,581	285,723	1,226,484	40,406	189,090	860,654	35,782	253,000	762,153
B10 - Bailey 10	35,846	181,503	1,164,990	27,748	278,363	901,800	43,948	273,114	1,428,316	30,840	180,745	1,002,284	27,310	241,835	887,574
B11 - Bailey 11	40,646	185,121	642,213	31,464	283,931	497,127	49,834	278,557	787,375	34,970	184,348	552,520	30,967	246,655	489,285
B12 - Bailey 12	61,674	200,967	2,417,621	47,741	308,235	1,871,441	75,614	302,401	2,964,083	53,060	200,128	2,079,970	46,988	267,769	1,841,920
B21 - Bailey 21	-2,402	164,722	-49,956	-1,859	252,644	-38,670	-2,945	247,862	-61,248	-2,066	164,034	-42,979	-1,830	219,475	-38,060
B22A - Bailey 22A	61,674	200,967	986,784	47,741	308,235	763,853	75,614	302,401	1,209,830	53,060	200,128	848,967	46,988	267,769	751,804

MAURER-STUTZ

Project Number: 23804009.1

Planned By: GCB

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2017

Fall 2017 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	201	4.19	4.32	4.77	2,385	4.11	1.51	5.62	19.90	200967
4089A	202 A	2.52	0.80	3.11	1,555	2.47	0.28	2.75	12.98	308235
4090	203	1.75	0.83	3.17	1,585	1.72	0.29	2.01	13.23	302401
4091A	601 A	0.62	0.50	4.79	2,395	0.61	0.18	0.78	19.99	200128
4092	602	2.99	0.72	3.58	1,790	2.93	0.25	3.18	14.94	267769

Spring 2018 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	201	3.00	0.68	4.77	2,385	2.94	0.24	3.18	19.90	200967
4089A	202 A	4.00	0.53	3.11	1,555	3.92	0.19	4.11	12.98	308235
4090	203	2.47	0.49	3.17	1,585	2.42	0.17	2.59	13.23	302401
4091A	601 A	3.63	0.39	4.79	2,395	3.56	0.14	3.69	19.99	200128
4092	602	4.06	0.55	3.58	1,790	3.98	0.19	4.17	14.94	267769

MAURER-STUTZ

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECORDS
CROP YEAR 2018

Project Number: 23804009.11
Planned By: GCB

Field Number	2017 Crop	2018 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Soybeans	Corn Grain	23	196	70	45											
B2 - Bailey 2	Corn Grain	Soybeans	19	196	31	47											
B3 - Bailey 3	Corn Grain	Soybeans	45	196	31	48											
B4 - Bailey 4	Corn Grain	Corn Grain	23	196	77	50											
B5 - Bailey 5	Corn Grain	Corn Grain	36	196	54	35											
B6 - Bailey 6	Soybeans	Corn Grain	64	196	70	46											
B7 - Bailey 7	Soybeans	Corn Grain	33	196	70	46											
B8 - Bailey 8	Soybeans	Corn Grain	47	196	70	46											
B9 - Bailey 9	Soybeans	Corn Grain	21	196	70	46											
B10 - Bailey 10	Corn Grain	Soybeans	33	196	31	48											
B11 - Bailey 11	Corn Grain	Soybeans	16	196	31	47											
B12 - Bailey 12	Corn Grain	Soybeans	39	196	31	47											
B21 - Bailey 21	Corn Grain	Corn Grain	21	196	54	35											
B22 - Bailey 22	Corn Grain	Soybeans	14	196	21	33											
B22A - Bailey 22A	Corn Grain	Soybeans	16	196	32	49											
S24 - Shan 24	Corn Grain	Soybeans	100	196	39	60											
S25 - Shan 25	Corn Grain	Soybeans	73	196	39	60											
S27 - Shan 27	Corn Grain	Soybeans	105	196	39	60											
S28 - Shan 28	Soybeans	Corn Grain	111	196	71	46											
S29 - Shan 29	Corn Grain	Soybeans	73	196	38	59											
S30 - Shan 30	Corn Grain	Soybeans	37	196	39	60											
S31E - Shan 31 E	Soybeans	Corn Grain	44	196	57	37											
S31W - Shan 31 W	Soybeans	Corn Grain	56	196	57	37											
S32 - Shan 32	Corn Grain	Soybeans	60	196	43	65											
S33 - Shan Williams 33	Soybeans	Corn Grain	26	196	39	25											
S34 - Shan Williams 34	Corn Grain	Corn Grain	56	196	45	29											
H37 HolHome (931)	Soybeans	Corn Grain	46	196	62	41											

MAURER-STUTZ

Project Number: 23804009.11
Planned By: GCB

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2018 - FALL APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	48,460	200,967	1,114,573	73,414	308,235	1,688,516
B2 - Bailey 2	48,460	200,967	925,580	73,414	308,235	1,402,202
B3 - Bailey 3	48,460	200,967	2,200,069	73,414	308,235	3,332,984
B4 - Bailey 4	48,460	200,967	1,100,035	73,414	308,235	1,666,492
B5 - Bailey 5	48,460	200,967	1,744,548	73,414	308,235	2,642,895
B6 - Bailey 6	48,460	200,967	3,111,111	73,414	308,235	4,713,162
B7 - Bailey 7	48,460	200,967	1,599,169	73,414	308,235	2,422,653
B8 - Bailey 8	48,460	200,967	2,253,375	73,414	308,235	3,413,739
B9 - Bailey 9	48,460	200,967	1,032,191	73,414	308,235	1,563,713
B10 - Bailey 10	48,460	200,967	1,574,939	73,414	308,235	2,385,947
B11 - Bailey 11	48,460	200,967	765,663	73,414	308,235	1,159,937
B12 - Bailey 12	48,460	200,967	1,899,619	73,414	308,235	2,877,819
B21 - Bailey 21	48,460	200,967	1,007,961	73,414	308,235	1,527,006
B22 - Bailey 22	48,460	200,967	692,973	73,414	308,235	1,049,816
B22A - Bailey 22A	48,460	200,967	775,355	73,414	308,235	1,174,620
S24 - Shan 24	48,460	200,967	4,821,738	73,414	308,235	7,304,667
S25 - Shan 25	48,460	200,967	3,532,710	73,414	308,235	5,351,862
S27 - Shan 27	48,460	200,967	5,078,574	73,414	308,235	7,693,760
S28 - Shan 28	48,460	200,967	5,364,486	73,414	308,235	8,126,901
S29 - Shan 29	48,460	200,967	3,537,556	73,414	308,235	5,359,203
S30 - Shan 30	48,460	200,967	1,802,700	73,414	308,235	2,730,991
S31E - Shan 31 E	48,460	200,967	2,141,918	73,414	308,235	3,244,887
S31W - Shan 31 W	48,460	200,967	2,713,742	73,414	308,235	4,111,169
S32 - Shan 32	48,460	200,967	2,893,043	73,414	308,235	4,382,800
S33 - Shan Williams 33	48,460	200,967	1,250,260	73,414	308,235	1,894,074
S34 - Shan Williams 34	48,460	200,967	2,704,050	73,414	308,235	4,096,487
H37 HolHome (931)	48,460	200,967	2,224,299	73,414	308,235	3,369,691

	Source #4090 (Elm River)			Source #4091A (Little Wabash)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	73,529	302,401	1,691,176	47,490	200,128	1,092,266
B2 - Bailey 2	73,529	302,401	1,404,412	47,490	200,128	907,056
B3 - Bailey 3	73,529	302,401	3,338,235	47,490	200,128	2,156,038
B4 - Bailey 4	73,529	302,401	1,669,118	47,490	200,128	1,078,019
B5 - Bailey 5	73,529	302,401	2,647,059	47,490	200,128	1,709,634
B6 - Bailey 6	73,529	302,401	4,720,588	47,490	200,128	3,048,847
B7 - Bailey 7	73,529	302,401	2,426,471	47,490	200,128	1,567,164
B8 - Bailey 8	73,529	302,401	3,419,118	47,490	200,128	2,208,277
B9 - Bailey 9	73,529	302,401	1,566,176	47,490	200,128	1,011,533
B10 - Bailey 10	73,529	302,401	2,389,706	47,490	200,128	1,543,419
B11 - Bailey 11	73,529	302,401	1,161,765	47,490	200,128	750,339
B12 - Bailey 12	73,529	302,401	2,882,353	47,490	200,128	1,861,601
B21 - Bailey 21	73,529	302,401	1,529,412	47,490	200,128	987,788
B22 - Bailey 22	73,529	302,401	1,051,471	47,490	200,128	679,104
B22A - Bailey 22A	73,529	302,401	1,176,471	47,490	200,128	759,837
S24 - Shan 24	73,529	302,401	7,316,176	47,490	200,128	4,725,237
S25 - Shan 25	73,529	302,401	5,360,294	47,490	200,128	3,462,008
S27 - Shan 27	73,529	302,401	7,705,882	47,490	200,128	4,976,934
S28 - Shan 28	73,529	302,401	8,139,706	47,490	200,128	5,257,123
S29 - Shan 29	73,529	302,401	5,367,647	47,490	200,128	3,466,757
S30 - Shan 30	73,529	302,401	2,735,294	47,490	200,128	1,766,621
S31E - Shan 31 E	73,529	302,401	3,250,000	47,490	200,128	2,099,050
S31W - Shan 31 W	73,529	302,401	4,117,647	47,490	200,128	2,659,430
S32 - Shan 32	73,529	302,401	4,389,706	47,490	200,128	2,835,142
S33 - Shan Williams 33	73,529	302,401	1,897,059	47,490	200,128	1,225,237
S34 - Shan Williams 34	73,529	302,401	4,102,941	47,490	200,128	2,649,932
H37 HolHome (931)	73,529	302,401	3,375,000	47,490	200,128	2,179,783

	Source #4092 (Lakeside)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	63,898	267,769	1,469,649
B2 - Bailey 2	63,898	267,769	1,220,447
B3 - Bailey 3	63,898	267,769	2,900,958
B4 - Bailey 4	63,898	267,769	1,450,479
B5 - Bailey 5	63,898	267,769	2,300,319
B6 - Bailey 6	63,898	267,769	4,102,236
B7 - Bailey 7	63,898	267,769	2,108,626
B8 - Bailey 8	63,898	267,769	2,971,246
B9 - Bailey 9	63,898	267,769	1,361,022
B10 - Bailey 10	63,898	267,769	2,076,677
B11 - Bailey 11	63,898	267,769	1,009,585
B12 - Bailey 12	63,898	267,769	2,504,792
B21 - Bailey 21	63,898	267,769	1,329,073
B22 - Bailey 22	63,898	267,769	913,738
B22A - Bailey 22A	63,898	267,769	1,022,364
S24 - Shan 24	63,898	267,769	6,357,827
S25 - Shan 25	63,898	267,769	4,658,147
S27 - Shan 27	63,898	267,769	6,696,486
S28 - Shan 28	63,898	267,769	7,073,482
S29 - Shan 29	63,898	267,769	4,664,537
S30 - Shan 30	63,898	267,769	2,376,997
S31E - Shan 31 E	63,898	267,769	2,824,281
S31W - Shan 31 W	63,898	267,769	3,578,275
S32 - Shan 32	63,898	267,769	3,814,696
S33 - Shan Williams 33	63,898	267,769	1,648,562
S34 - Shan Williams 34	63,898	267,769	3,565,495
H37 HolHome (931)	63,898	267,769	2,932,907

MAURER-STUTZ

Project Number: 23804009.1

Planned By: GCB

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2017

Fall 2017 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	201	4.19	4.32	4.77	2,385	4.11	1.51	5.62	19.90	200967
4089A	202 A	2.52	0.80	3.11	1,555	2.47	0.28	2.75	12.98	308235
4090	203	1.75	0.83	3.17	1,585	1.72	0.29	2.01	13.23	302401
4091A	601 A	0.62	0.50	4.79	2,395	0.61	0.18	0.78	19.99	200128
4092	602	2.99	0.72	3.58	1,790	2.93	0.25	3.18	14.94	267769

Spring 2017 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	201	3.77	1.00	4.77	2,385	3.69	0.35	4.04	19.90	200967
4089A	202 A	2.51	0.60	3.11	1,555	2.46	0.21	2.67	12.98	308235
4090	203	2.47	0.70	3.17	1,585	2.42	0.25	2.67	13.23	302401
4091A	601 A	3.89	0.90	4.79	2,395	3.81	0.32	4.13	19.99	200128
4092	602	2.88	0.70	3.58	1,790	2.82	0.25	3.07	14.94	267769

MAURER-STUTZ

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECORDS

CROP YEAR 2017

Project Number: 23804009.11
Planned By: GCB

Field Number	2016 Crop	2017 Crop	Spreadable Acres	Nitrogen Allowed/Fert. Recommendations			Fall Manure App 1			Fall Manure App 2			Fall Manure App 3			Total Applied (lbs/acre)	
				N	P2O5	K2O	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	Rate 1000 GAL	Source	Acres	N	Salts
B1 - Bailey 1	Corn Grain	Soybeans	23	196	23	35	42.043	602	23.0							100	1,042
B2 - Bailey 2	Soybeans	Corn Grain	19	196	77	50	31.832	201	19.1							90	760
B3 - Bailey 3	Soybeans	Corn Grain	45	196	77	50	44.229	201	19.7	44.229	203	25.9				113	965
B4 - Bailey 4	Soybeans	Corn Grain	23	196	77	50											
B5 - Bailey 5	Soybeans	Corn Grain	36	196	54	35	35.000	201	10.1	35.000	202 A	25.9				74	619
B6 - Bailey 6	Corn Grain	Soybeans	64	196	23	35	21.694	602	11.7	21.694	602	52.3				52	538
B7 - Bailey 7	Corn Grain	Soybeans	33	196	23	35	21.964	601 A	33.0							15	307
B8 - Bailey 8	Corn Grain	Soybeans	47	196	23	35	21.964	601 A	23.2	21.964	602	23.8				34	432
B9 - Bailey 9	Corn Grain	Soybeans	21	196	23	35	21.964	601 A	21.0							15	307
B10 - Bailey 10	Soybeans	Corn Grain	33	196	77	50	23.631	202 A	32.5							43	361
B11 - Bailey 11	Soybeans	Corn Grain	16	196	77	50											
B12 - Bailey 12	Soybeans	Corn Grain	39	196	77	50	33.852	601 A	39.2							22	473
B21 - Bailey 21	Soybeans	Corn Grain	21	196	54	35	34.760	201	11.5	34.760	201	9.3				98	830
B22 - Bailey 22	Soybeans	Corn Grain	14	196	77	50											
B22A - Bailey 22A	Soybeans	Corn Grain	16	196	77	50	31.313	201	16.0							88	747
S24 - Shan 24	Soybeans	Corn Grain	100	196	83	54	19.628	202 A	99.5							36	300
S25 - Shan 25	Soybeans	Corn Grain	73	196	85	55											
S27 - Shan 27	Soybeans	Corn Grain	105	196	89	58	20.143	203	104.8							47	403
S28 - Shan 28	Soybeans	Soybeans	111	196	46	70											
S29 - Shan 29	Soybeans	Corn Grain	73	196	71	46											
S30 - Shan 30	Soybeans	Corn Grain	37	196	85	55											
S31E - Shan 31 E	Soybeans	Soybeans	44	196	45	69											
S31W - Shan 31 W	Soybeans	Soybeans	56	196	45	69											
S32 - Shan 32	Soybeans	Corn Grain	60	196	85	55											
S33 - Shan Williams 33	Soybeans	Soybeans	26	196	37	56											
S34 - Shan Williams 34	Corn Grain	Corn Grain	56	196	45	29											
E16 - Eckel Bass	*Corn Grain*	*Soybeans*	21	196	35	53											
E17 - Eckel Bass	*Corn Grain*	*Soybeans*	59	196	35	53											
E19 - Eckel Bass	*Corn Grain*	*Soybeans*	52	196	35	53											
E18 - Eckel Bass	*Corn Grain*	*Soybeans*	39	196	29	44											
E20 -Eckel Bass	*Corn Grain*	*Soybeans*	94	196	29	44											
H37 HolHome (931)	Corn Grain	Soybeans	46	196	33	51	29.172	602	45.9							70	723
H36 - Ronnie (932)	*Soybeans*	*Corn Grain*	168	196	70	45											
E38E - Eckel Iles E	*Corn Grain*	*Corn Grain*	19	196	84	55											
E35 - Eckel Bass	*Corn Grain*	*Corn Grain*	21	196	82	53											
E38N (Ekel Iles N)	*Corn Grain*	*Corn Grain*	78	196	84	55											
E38S (Eckel Iles S)	*Corn Grain*	*Corn Grain*	86	196	84	55											

MAURER-STUTZ

Project Number: 23804009.11
Planned By: GCB

SMITHFIELD - MT. ERIE - MANURE APPLICATION RECOMMENDATIONS
CROP YEAR 2017 - SPRING APPLICATION

	Source #4088 (Mt. Erie)			Source #4089A (Lakeview)			Source #4090 (Elm River)			Source #4091A (Little Wabash)			Source #4092 (Lakeside)		
Field Number	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons	Max. Rate due to Remaining N Rate (Gal/Acre)	Max. Rate due to Salt (Gal/Acre)	Total Gallons
B1 - Bailey 1	23,618	148,611	543,216	35,780	227,934	822,942	35,836	223,620	824,238	23,145	147,991	532,344	31,142	198,010	716,271
B2 - Bailey 2	26,247	162,795	501,312	39,762	249,689	759,460	39,825	244,963	760,656	25,721	162,115	491,279	34,608	216,909	661,018
B3 - Bailey 3	20,428	152,499	927,438	30,948	233,898	1,405,017	30,996	229,471	1,407,231	20,019	151,863	908,876	26,936	203,191	1,222,897
B4 - Bailey 4	48,460	200,967	1,100,035	73,414	308,235	1,666,492	73,529	302,401	1,669,118	47,490	200,128	1,078,019	63,898	267,769	1,450,479
B5 - Bailey 5	30,251	169,888	1,089,050	45,829	260,567	1,649,850	45,901	255,635	1,652,450	29,646	169,178	1,067,254	39,889	226,359	1,435,995
B6 - Bailey 6	35,642	173,952	2,288,185	53,995	266,800	3,466,475	54,080	261,751	3,471,937	34,928	173,225	2,242,391	46,996	231,773	3,017,146
B7 - Bailey 7	44,856	185,541	1,480,249	67,954	284,576	2,242,496	68,061	279,190	2,246,029	43,958	184,767	1,450,624	59,146	247,216	1,951,821
B8 - Bailey 8	40,021	179,274	1,860,995	60,630	274,964	2,819,305	60,726	269,759	2,823,747	39,220	178,525	1,823,750	52,771	238,865	2,453,863
B9 - Bailey 9	44,856	185,541	955,433	67,954	284,576	1,447,429	68,061	279,190	1,449,710	43,958	184,767	936,312	59,146	247,216	1,259,812
B10 - Bailey 10	37,793	182,835	1,228,286	57,255	280,425	1,860,786	57,345	275,117	1,863,718	37,037	182,071	1,203,704	49,833	243,610	1,619,588
B11 - Bailey 11	48,460	200,967	765,663	73,414	308,235	1,159,937	73,529	302,401	1,161,765	47,490	200,128	750,339	63,898	267,769	1,009,585
B12 - Bailey 12	42,906	177,192	1,681,898	65,000	271,771	2,547,983	65,102	266,627	2,551,997	42,047	176,452	1,648,237	56,574	236,091	2,217,710
B21 - Bailey 21	24,203	159,284	503,432	36,667	244,304	762,672	36,725	239,680	763,874	23,719	158,619	493,357	31,914	212,230	663,814
B22 - Bailey 22	48,460	200,967	692,973	73,414	308,235	1,049,816	73,529	302,401	1,051,471	47,490	200,128	679,104	63,898	267,769	913,738
B22A - Bailey 22A	26,609	163,417	425,742	40,311	250,643	644,975	40,374	245,899	645,992	26,076	162,735	417,221	35,086	217,738	561,373
S24 - Shan 24	39,600	185,906	3,940,224	59,992	285,136	5,969,222	60,087	279,739	5,978,627	38,808	185,130	3,861,366	52,218	247,702	5,195,484
S25 - Shan 25	48,460	200,967	3,532,710	73,414	308,235	5,351,862	73,529	302,401	5,360,294	47,490	200,128	3,462,008	63,898	267,769	4,658,147
S27 - Shan 27	36,802	180,697	3,856,847	55,753	277,146	5,842,911	55,841	271,901	5,852,117	36,065	179,943	3,779,858	48,526	240,761	5,085,546
S28 - Shan 28	48,460	200,967	5,364,486	73,414	308,235	8,126,901	73,529	302,401	8,139,706	47,490	200,128	5,257,123	63,898	267,769	7,073,482
S29 - Shan 29	48,460	200,967	3,537,556	73,414	308,235	5,359,203	73,529	302,401	5,367,647	47,490	200,128	3,466,757	63,898	267,769	4,664,537
S30 - Shan 30	48,460	200,967	1,802,700	73,414	308,235	2,730,991	73,529	302,401	2,735,294	47,490	200,128	1,766,621	63,898	267,769	2,376,997
S31E - Shan 31 E	48,460	200,967	2,141,918	73,414	308,235	3,244,887	73,529	302,401	3,250,000	47,490	200,128	2,099,050	63,898	267,769	2,824,281
S31W - Shan 31 W	48,460	200,967	2,713,742	73,414	308,235	4,111,169	73,529	302,401	4,117,647	47,490	200,128	2,659,430	63,898	267,769	3,578,275
S32 - Shan 32	48,460	200,967	2,893,043	73,414	308,235	4,382,800	73,529	302,401	4,389,706	47,490	200,128	2,835,142	63,898	267,769	3,814,696
S33 - Shan Williams 33	48,460	200,967	1,250,260	73,414	308,235	1,894,074	73,529	302,401	1,897,059	47,490	200,128	1,225,237	63,898	267,769	1,648,562
S34 - Shan Williams 34	48,460	200,967	2,704,050	73,414	308,235	4,096,487	73,529	302,401	4,102,941	47,490	200,128	2,649,932	63,898	267,769	3,565,495
E16 - Eckel Bass	48,460	200,967	993,423	73,414	308,235	1,504,982	73,529	302,401	1,507,353	47,490	200,128	973,541	63,898	267,769	1,309,904
E17 - Eckel Bass	48,460	200,967	2,844,583	73,414	308,235	4,309,386	73,529	302,401	4,316,176	47,490	200,128	2,787,653	63,898	267,769	3,750,799
E19 - Eckel Bass	48,460	200,967	2,539,287	73,414	308,235	3,846,880	73,529	302,401	3,852,941	47,490	200,128	2,488,467	63,898	267,769	3,348,243
E18 - Eckel Bass	48,460	200,967	1,904,465	73,414	308,235	2,885,160	73,529	302,401	2,889,706	47,490	200,128	1,866,350	63,898	267,769	2,511,182
E20 -Eckel Bass	48,460	200,967	4,535,826	73,414	308,235	6,871,526	73,529	302,401	6,882,353	47,490	200,128	4,445,047	63,898	267,769	5,980,831
H37 HolHome (931)	31,223	164,639	1,433,138	47,301	252,518	2,171,125	47,376	247,738	2,174,546	30,598	163,952	1,404,456	41,170	219,366	1,889,701
H36 - Ronnie (932)	48,460	200,967	8,155,763	73,414	308,235	12,355,532	73,529	302,401	12,375,000	47,490	200,128	7,992,537	63,898	267,769	10,753,994
E38E - Eckel Iles E	48,460	200,967	915,888	73,414	308,235	1,387,520	73,529	302,401	1,389,706	47,490	200,128	897,558	63,898	267,769	1,207,668
E35 - Eckel Bass	48,460	200,967	998,269	73,414	308,235	1,512,323	73,529	302,401	1,514,706	47,490	200,128	978,290	63,898	267,769	1,316,294
E38N (Ekel Iles N)	48,460	200,967	3,794,393	73,414	308,235	5,748,296	73,529	302,401	5,757,353	47,490	200,128	3,718,453	63,898	267,769	5,003,195
E38S (Eckel Iles S)	48,460	200,967	4,167,532	73,414	308,235	6,313,582	73,529	302,401	6,323,529	47,490	200,128	4,084,125	63,898	267,769	5,495,208

MAURER-STUTZ

Project Number: 23804009.1

Planned By: GCB

SMITHFIELD - MT ERIE - MANURE TEST SUMMARY
CY 2017

Fall 2016 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	201	2.63	0.70	5.72	2,860	2.58	0.25	2.82	23.87	167589
4089A	202 A	1.72	0.40	3.66	1,830	1.69	0.14	1.83	15.27	261916
4090	203	2.21	0.50	4.80	2,400	2.17	0.18	2.34	20.03	199711
4091A	601 A	0.57	0.30	3.35	1,675	0.56	0.11	0.66	13.98	286153
4092	602	2.26	0.50	5.94	2,970	2.21	0.18	2.39	24.79	161382

Spring 2017 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	201	3.77	1.00	4.77	2,385	3.69	0.35	4.04	19.90	200967
4089A	202 A	2.51	0.60	3.11	1,555	2.46	0.21	2.67	12.98	308235
4090	203	2.47	0.70	3.17	1,585	2.42	0.25	2.67	13.23	302401
4091A	601 A	3.89	0.90	4.79	2,395	3.81	0.32	4.13	19.99	200128
4092	602	2.88	0.70	3.58	1,790	2.82	0.25	3.07	14.94	267769

Murphy Farms, LLC Application Rate Calculations

Spring 2016

Ammonia Loss:	0.02	Injected
Organic Mineralization:	0.35	

mS/cm ~ 500 ppm or mg/L

Fall 2015 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	
4088	201	1.70	0.80	3.05	1,525.0	Fall 2015 #'s
4089A	202 A	2.50	0.80	2.64	1,320.0	Fall 2015 #'s
4090	203	1.70	0.80	2.24	1,120.0	Spring 2015 #'s
4091A	601 A	1.70	0.80	2.41	1,205.0	Fall 2015 #'s
4092	602	3.40	0.00	3.83	1,915.0	Fall 2015 #'s

Source #		NH3 Available	Organic Available	Total N Available	Salts #/1000 gal
4088	201	1.67	0.28	1.95	12.7
4089A	202 A	2.45	0.28	2.73	11.0
4090	203	1.67	0.28	1.95	9.3
4091A	601 A	1.67	0.28	1.95	10.1
4092	602	3.33	0.00	3.33	15.0

mS/cm ~ 500 ppm or mg/L

Spring 2014 Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	
4088	201	2.94	0.50	5.82	2,910.0	Spring 2016 #'s
4089A	202 A	4.07	0.40	6.02	3,010.0	Spring 2016 #'s
4090	203	2.09	0.60	4.66	2,330.0	Spring 2016 #'s
4091A	601 A	3.62	0.50	6.12	3,060.0	Spring 2016 #'s
4092	602	2.42	0.40	6.04	3,020.0	Spring 2016 #'s

Source #		NH3 Available	Organic Available	Total N Available	Salts #/1000 gal	Max. Rate based on Salts
4088	201	2.88	0.18	3.06	24.3	164,710
4089A	202 A	3.99	0.14	4.13	25.1	159,238
4090	203	2.05	0.21	2.26	19.4	205,711
4091A	601 A	3.55	0.18	3.72	25.5	156,836
4092	602	2.37	0.14	2.51	25.2	158,711

				Source #4088 (Mt. Erie)				Source #4089A (Lakeview)				Source #4090 (Elm River)				Source #4091A (Little Wabash)				Source #4092 (Lakeside)			
2016 Crop	Field Number	Spreadable Acres	Remaining Nitrogen Application lb/Acre	FALL Allowable Appl. Rate (Gal/Acre)	Spring Allowable Appl. Rate (Gal/Acre)	Max. Rate due to Salt or remaining N	Total Gallons	FALL Allowable Appl. Rate (Gal/Acre)	Spring Allowable Appl. Rate (Gal/Acre)	Max. Rate due to Salt or remaining	Total Gallons	FALL Allowable Appl. Rate (Gal/Acre)	Spring Allowable Appl. Rate (Gal/Acre)	Max. Rate due to Salt or remaining	Total Gallons	FALL Allowable Appl. Rate (Gal/Acre)	Spring Allowable Appl. Rate (Gal/Acre)	Max. Rate due to Salt or remaining	Total Gallons	FALL Allowable Appl. Rate (Gal/Acre)	Spring Allowable Appl. Rate (Gal/Acre)	Max. Rate due to Salt or remaining	Total Gallons
Corn Grain	B1 - Bailey 1	23	81		26,340	26,340	605,818		19,498	19,498	448,457		35,648	35,648	819,901		21,625	21,625	497,367		32,051	32,051	737,179
Soybeans Grain	B2 - Bailey 2	19	153		50,798	50,798	970,249		37,604	37,604	716,229		68,749	68,749	1,313,114		41,705	41,705	796,560		61,813	61,813	1,180,632
Soybeans Grain	B3 - Bailey 3	45	155		50,839	50,839	2,308,103		37,634	37,634	1,708,576		68,805	68,805	3,123,738		41,738	41,738	1,894,919		61,863	61,863	2,808,578
Soybeans Grain	B4 - Bailey 4	23	162		52,843	52,843	1,199,545		39,117	39,117	887,964		71,517	71,517	1,623,439		43,384	43,384	984,809		64,302	64,302	1,459,647
Soybeans Grain	B5 - Bailey 5	36	225		73,621	73,621	2,650,350		54,498	54,498	1,961,924		99,637	99,637	3,586,928		60,442	60,442	2,175,899		89,584	89,584	3,225,036
Corn Grain	B6 - Bailey 6	64	105		34,438	34,438	2,210,932		25,493	25,493	1,638,644		46,608	46,608	2,992,228		28,273	28,273	1,815,143		41,906	41,906	2,690,337
Corn Grain	B7 - Bailey 7	33	105		34,438	34,438	1,136,460		25,493	25,493	841,266		46,608	46,608	1,538,061		28,273	28,273	933,017		41,906	41,906	1,382,883
Corn Grain	B8 - Bailey 8	47	143		46,790	46,790	2,175,741		34,636	34,636	1,610,594		63,325	63,325	2,944,602		38,414	38,414	1,786,252		56,936	56,936	2,647,516
Corn Grain	B9 - Bailey 9	21	143		46,790	46,790	996,630		34,636	34,636	737,756		63,325	63,325	1,348,818		38,414	38,414	818,218		56,936	56,936	1,212,733
Corn Grain	B10 - Bailey 10	33	138		44,991	44,991	1,462,192		33,304	33,304	1,082,389		60,889	60,889	1,978,899		36,937	36,937	1,200,438		54,746	54,746	1,779,244
Corn Grain	B11 - Bailey 11	16	145		47,281	47,281	747,039		35,000	35,000	552,996		63,989	63,989	1,011,026		38,817	38,817	613,308		57,533	57,533	909,022
Corn Grain	B12 - Bailey 12	39	144		46,954	46,954	1,840,586		34,758	34,758	1,362,496		63,546	63,546	2,491,011		38,548	38,548	1,511,094		57,135	57,135	2,239,688
Soybeans Grain	B21 - Bailey 21	21	241		78,856	78,856	1,640,207		58,373	58,373	1,214,165		106,722	106,722	2,219,821		64,740	64,740	1,346,586		95,955	95,955	1,995,859
Soybeans Grain	B22 - Bailey 22	14	198		64,868	64,868	927,614		48,019	48,019	686,667		87,791	87,791	1,255,414		53,256	53,256	761,558		78,934	78,934	1,128,753
Soybeans Grain	B22A - Bailey 22A	16	152		49,858	49,858	797,723		36,907	36,907	590,515		67,476	67,476	1,079,621		40,932	40,932	654,919		60,668	60,668	970,696
Corn Grain	S24 - Shan 24	100	199		65,195	65,195	6,486,936		48,261	48,261	4,801,961		88,234	88,234	8,779,282		53,524	53,524	5,325,650		79,332	79,332	7,893,524
Corn Grain	S25 - Shan 25	73	199		65,032	65,032	4,740,814		48,140	48,140	3,509,392		88,013	88,013	6,416,117		53,390	53,390	3,892,139		79,133	79,133	5,768,783
Corn Grain	S27 - Shan 27	105	199		65,195	65,195	6,832,472		48,261	48,261	6,057,744		88,234	88,234	9,246,922		53,524	63,524	5,609,359		79,332	79,332	8,313,983
Soybeans Grain	S28 - Shan 28	111	200		65,441	65,441	7,244,290		48,443	48,443	5,362,593		88,566	88,566	9,804,269		53,726	53,726	5,947,456		79,631	79,631	8,815,098
Corn Grain	S29 - Shan 29	73	200		65,441	65,441	4,777,174		48,443	48,443	3,536,300		88,566	88,566	6,465,326		53,726	53,726	3,921,990		79,631	79,631	5,813,028
Corn Grain	S30 - Shan 30	37	200		65,441	65,441	2,434,396		48,443	48,443	1,802,064		88,566	88,566	3,294,659		53,726	53,726	1,998,603		79,631	79,631	2,962,255
Soybeans Grain	S31E - Shan 31 E	44	196		64,132	64,132	2,834,631		47,474	47,474	2,098,338		86,795	86,795	3,836,330		52,651	52,651	2,327,191		78,038	78,038	3,449,275
Soybeans Grain	S31W - Shan 31 W	56	196		64,132	64,132	3,591,388		47,474	47,474	2,658,528		86,795	86,795	4,860,508		52,651	52,651	2,948,477		78,038	78,038	4,370,123
Corn Grain	S32 - Shan 32	60	199		65,154	65,154	3,889,720		48,231	48,231	2,879,369		88,179	88,179	5,264,265		53,491	53,491	3,193,403		79,282	79,282	4,733,143
Soybeans Grain	S33 - Shan Williams 33	26	196		64,132	64,132	1,654,604		47,474	47,474	1,224,822		86,795	86,795	2,239,306		52,651	52,651	1,358,405		78,038	78,038	2,013,378
Soybeans Grain	S34 - Shan Williams 34	56	200		65,441	65,441	3,661,593		48,443	48,443	2,703,095		88,566	88,566	4,941,989		53,726	53,726	2,997,905		79,631	79,631	4,443,383
Corn Grain	E16 - Eckel Bass	21	199		65,236	65,236	1,337,343		48,291	48,291	989,969		88,289	88,289	1,809,932		53,558	53,558	1,097,939		79,382	79,382	1,627,324
Corn Grain	E17 - Eckel Bass	59	199		65,236	65,236	3,829,367		48,291	48,291	2,834,693		88,289	88,289	5,182,585		53,558	53,558	3,143,854		79,382	79,382	4,659,704
Corn Grain	E19 - Eckel Bass	52	200		65,441	65,441	3,429,095		48,443	48,443	2,538,391		88,566	88,566	4,640,864		53,726	53,726	2,815,237		79,631	79,631	4,172,639
Corn Grain	E18 - Eckel Bass	39	199		65,236	65,236	2,563,784		48,291	48,291	1,897,844		88,289	88,289	3,469,771		53,558	53,558	2,104,829		79,382	79,382	3,119,700
Corn Grain	E20 -Eckel Bass	94	200		65,441	65,441	6,125,254		48,443	48,443	4,534,225		88,566	88,566	8,289,788		53,726	53,726	5,028,743		79,631	79,631	7,453,416
Corn Grain	H37 Hollome (931)	46	113		36,892	36,892	1,693,353		27,309	27,309	1,253,506		49,929	49,929	2,291,748		30,288	30,288	1,390,218		44,892	44,892	2,060,529
Soybeans Grain	H36 - Ronnie (932)	168	197		64,418	64,418	10,841,588		47,686	47,686	8,025,496		87,182	87,182	14,672,776		52,886	52,886	8,900,785		78,386	78,386	13,192,412
Corn Grain	E38E - Eckel Iles E	19	187		61,105	61,105	1,154,890		45,233	45,233	854,908		82,699	82,699	1,563,004		50,167	50,167	948,148		74,355	74,355	1,405,309
Corn Grain	E35 - Eckel Bass	21	200		65,441	65,441	1,348,079		48,443	48,443	997,917		88,566	88,566	1,824,462		53,726	53,726	1,106,753		79,631	79,631	1,640,389
Corn Grain	E38N (Eckel Iles N)	78	187		61,105	61,105	4,784,545		45,233	45,233	3,541,764		82,699	82,699	6,475,301		50,167	50,167	3,928,041		74,355	74,355	5,821,996
Corn Grain	E38S (Eckel Iles S)	86	187		61,105	61,105	5,255,055		45,233	45,233	3,890,060		82,699	82,699	7,112,080		50,167	50,167	4,314,373		74,355	74,355	6,394,529

Murphy Farms, LLC Application Rate Calculations

Spring 2015

Ammonia Loss:	0.02	Injected
Organic Mineralization:	0.35	

mS/cm ~ 500 ppm or mg/L

Fall 2014

Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	
4088	201	2.50	0.60	3.45	1,725.0	Fall 2014 #'s
4089A	202 A	3.40	0.08	3.23	1,615.0	Fall 2014 #'s
4090	203	1.70	9.30	2.24	1,120.0	Fall 2014 #'s
4091A	601 A	2.50	6.80	2.63	1,315.0	Fall 2014 #'s
4092	602	1.79	0.64	5.26	2,630.0	Fall 2012 #'s

Source #		NH3 Available	Organic Available	Total N Available	Salts #/1000 gal
4088	201	2.45	0.28	2.73	14.4
4089A	202 A	3.33	0.03	3.36	13.5
4090	203	1.67	3.26	4.92	9.3
4091A	601 A	2.45	2.38	4.83	11.0
4092	602	1.75	0.22	1.98	21.9

mS/cm ~ 500 ppm or mg/L

Spring 2014

Source #		NH3 #/1000 Gal	Org. N #/1000 Gal	Salts mS/cm	Salts mg/L	
4088	201	3.40	0.08	2.63	1,315.0	Spring 2014 #'s
4089A	202 A	4.20	0.90	2.82	1,410.0	Spring 2014 #'s
4090	203	1.70	0.80	1.82	910.0	Spring 2014 #'s
4091A	601 A	2.50	0.80	2.01	1,005.0	Spring 2014 #'s
4092	602	2.50	0.80	2.43	1,215.0	Spring 2014 #'s

Source #		NH3 Available	Organic Available	Total N Available	Salts #/1000 gal
4088	201	3.33	0.03	3.36	11.0
4089A	202 A	4.12	0.32	4.43	11.8
4090	203	1.67	0.28	1.95	7.6
4091A	601 A	2.45	0.28	2.73	8.4
4092	602	2.45	0.28	2.73	10.1

2015 Crop	Field Number	Spreadable Acres	Remaining Nitrogen Application lb/Acre	Source #4088 (Mt. Erie) FALL Allowable Appl. Rate (Gal/Acre)	Source #4088 (Mt. Erie) Spring Allowable Appl. Rate (Gal/Acre)	Source #4088 (Mt. Erie) Max. Rate due to Salt or remaining N	Source #4088 (Mt. Erie) Total Gallons	Source #4089A (Lakeview) FALL Allowable Appl. Rate (Gal/Acre)	Source #4089A (Lakeview) Spring Allowable Appl. Rate (Gal/Acre)	Source #4089A (Lakeview) Max. Rate due to Salt or remaining N	Source #4089A (Lakeview) Total Gallons
Soybeans Grain	B1 - Bailey 1	23	145		43,229	43,229	994,271		32,780	32,780	753,949
Wht/Soy	B2 - Bailey 2	19	167		49,665	49,665	945,605		37,661	37,661	719,321
Wht/Soy	B3 - Bailey 3	45	167		49,740	49,740	2,258,177		37,717	37,717	1,712,362
Wht/Soy	B4 - Bailey 4	23	182		54,241	54,241	1,231,272		41,131	41,131	933,666
Corn Grain	B5 - Bailey 5	36	199		59,189	59,189	2,130,804		44,883	44,883	1,615,775
Soybeans Grain	B6 - Bailey 6	64	43		12,909	12,909	826,772		9,789	9,789	628,453
Soybeans Grain	B7 - Bailey 7	33	43		12,909	12,909	426,004		9,789	9,789	323,037
Soybeans Grain	B8 - Bailey 8	47	124		37,016	37,016	1,721,261		28,069	28,069	1,305,222
Soybeans Grain	B9 - Bailey 9	21	121		36,086	36,086	768,638		27,364	27,364	582,854
Wht/Soy	B10 - Bailey 10	33	214		63,690	63,690	2,069,940		48,296	48,296	1,569,623
Soybeans Grain	B11 - Bailey 11	16	119		35,379	35,379	558,996		26,828	26,828	423,883
Soybeans Grain	B12 - Bailey 12	39	116		34,598	34,598	1,356,250		26,236	26,236	1,028,436
Corn Grain	B21 - Bailey 21	21	123		36,682	36,682	762,976		27,815	27,815	578,560
Wht/Soy	B22 - Bailey 22	14	296		88,021	88,021	1,258,698		66,746	66,746	954,463
Wht/Soy	B22A - Bailey 22A	16	158		47,061	47,061	752,976		35,686	35,686	570,977
Soybeans Grain	S24 - Shan 24	100	197		58,705	58,705	5,841,183		44,516	44,516	4,429,333
Soybeans Grain	S25 - Shan 25	73	197		58,705	58,705	4,279,621		44,516	44,516	3,245,210
Soybeans Grain	S27 - Shan 27	105	198		58,929	58,929	6,175,714		44,685	44,685	4,687,006
Corn Grain	S28 - Shan 28	111	199		59,301	59,301	6,564,576		44,967	44,967	4,977,877
Corn Grain	S29 - Shan 29	73	200		59,375	59,375	4,334,375		45,024	45,024	3,286,730
Soybeans Grain	S30 - Shan 30	37	200		59,449	59,449	2,211,518		45,080	45,080	1,676,980
Corn Grain	S31E - Shan 31 E	44	128		38,132	38,132	1,685,464		28,916	28,916	1,278,069
Corn Grain	S31W - Shan 31 W	56	128		38,132	38,132	2,135,417		28,916	28,916	1,619,273
Soybeans Grain	S32 - Shan 32	60	198		58,780	58,780	3,509,162		44,572	44,572	2,660,968
Corn Grain	S33 - Shan Williams 33	26	129		38,393	38,393	990,536		29,113	29,113	751,117
Corn Grain	S34 - Shan Williams 34	56	200		59,524	59,524	3,321,429		45,137	45,137	2,518,619
Soybeans Grain	E16 - Eckel Bass	21	198		58,966	58,966	1,208,798		44,713	44,713	916,624
Soybeans Grain	E17 - Eckel Bass	59	198		59,003	59,003	3,463,475		44,742	44,742	2,626,332
Soybeans Grain	E19 - Eckel Bass	52	200		59,412	59,412	3,113,199		45,052	45,052	2,360,720
Soybeans Grain	E18 - Eckel Bass	39	198		58,966	58,966	2,317,355		44,713	44,713	1,757,236
Soybeans Grain	E20 -Eckel Bass	94	199		59,338	59,338	5,554,019		44,995	44,995	4,211,578
Soybeans Grain	E35 - Eckel Bass	21	200		59,524	59,524	1,226,190		45,137	45,137	929,813
Soybeans Grain	E38E - Eckel Iles E	19	174		51,637	51,637	975,938		39,156	39,156	740,047
Soybeans Grain	E38N (Eckel Iles N)	78	174		51,637	51,637	4,043,170		39,156	39,156	3,065,911
Soybeans Grain	E38S (Eckel Iles S)	86	174		51,637	51,637	4,440,774		39,156	39,156	3,367,411
Corn Grain	H36 - Ronnie (932)	168	194		57,664	57,664	9,704,799		43,726	43,726	7,359,089
Soybeans Grain	H37 HolHome (931)	46	151		44,792	44,792	2,055,938		33,965	33,965	1,559,005

Field Number	Source #4090 (Elm River) FALL Allowable Appl. Rate (Gal/Acre)	Source #4090 (Elm River) Spring Allowable Appl. Rate (Gal/Acre)	Source #4090 (Elm River) Max. Rate due to Salt or remaining	Source #4090 (Elm River) Total Gallons	Source #4091A (Little Wabash) FALL Allowable Appl. Rate (Gal/Acre)	Source #4091A (Little Wabash) Spring Allowable Appl. Rate (Gal/Acre)	Source #4091A (Little Wabash) Max. Rate due to Salt or remaining	Source #4091A (Little Wabash) Total Gallons	Source #4092 (Lakeside) FALL Allowable Appl. Rate (Gal/Acre)	Source #4092 (Lakeside) Spring Allowable Appl. Rate (Gal/Acre)	Source #4092 (Lakeside) Max. Rate due to Salt or remaining	Source #4092 (Lakeside) Total Gallons
B1 - Bailey 1		74,640	74,640	1,716,727		53,205	53,205	1,223,718		53,205	53,205	1,223,718
B2 - Bailey 2		85,753	85,753	1,637,879		61,126	61,126	1,167,514		61,125	61,126	1,167,514
B3 - Bailey 3		85,881	85,881	3,899,011		61,218	61,218	2,779,295		61,218	61,218	2,779,295
B4 - Bailey 4		93,654	93,654	2,125,938		66,758	66,758	1,515,412		66,758	66,758	1,515,412
B5 - Bailey 5		102,197	102,197	3,679,085		72,848	72,848	2,622,527		72,848	72,848	2,622,527
B6 - Bailey 6		22,289	22,289	1,430,974		15,888	15,888	1,020,027		15,888	15,888	1,020,027
B7 - Bailey 7		22,289	22,289	735,547		15,888	15,888	524,313		15,888	15,888	524,313
B8 - Bailey 8		63,913	63,913	2,971,962		45,559	45,559	2,118,475		45,559	45,559	2,118,475
B9 - Bailey 9		62,307	62,307	1,327,145		44,414	44,414	946,016		44,414	44,414	946,016
B10 - Bailey 10		109,969	109,969	3,573,998		78,388	78,388	2,547,619		78,388	78,388	2,547,619
B11 - Bailey 11		61,087	61,087	965,172		43,544	43,544	687,995		43,544	43,544	687,995
B12 - Bailey 12		59,738	59,738	2,341,727		42,582	42,582	1,669,231		42,582	42,582	1,669,231
B21 - Bailey 21		63,335	63,335	1,317,369		45,147	45,147	939,048		45,147	45,147	939,048
B22 - Bailey 22		151,978	151,978	2,173,291		108,333	108,333	1,549,167		108,333	108,333	1,549,167
B22A - Bailey 22A		81,256	81,256	1,300,103		57,921	57,921	926,740		57,921	57,921	926,740
S24 - Shan 24		101,362	101,362	10,085,496		72,253	72,253	7,189,148		72,253	72,253	7,189,148
S25 - Shan 25		101,362	101,362	7,389,273		72,253	72,253	5,267,225		72,253	72,253	5,267,225
S27 - Shan 27		101,747	101,747	10,663,104		72,527	72,527	7,600,879		72,527	72,527	7,600,879
S28 - Shan 28		102,390	102,390	11,334,520		72,985	72,985	8,079,478		72,985	72,985	8,079,478
S29 - Shan 29		102,518	102,518	7,483,813		73,077	73,077	5,334,615		73,077	73,077	5,334,615
S30 - Shan 30		102,646	102,646	3,818,448		73,168	73,168	2,721,868		73,168	73,168	2,721,868
S31E - Shan 31 E		65,840	65,840	2,910,136		46,932	46,932	2,074,405		46,932	46,932	2,074,405
S31W - Shan 31 W		65,840	65,840	3,687,050		46,932	46,932	2,628,205		46,932	46,932	2,628,205
S32 - Shan 32		101,490	101,490	6,058,967		72,344	72,344	4,318,956		72,344	72,344	4,318,956
S33 - Shan Williams 33		66,290	66,290	1,710,277		47,253	47,253	1,219,121		47,253	47,253	1,219,121
S34 - Shan Williams 34		102,775	102,775	5,734,841		73,260	73,260	4,087,912		73,260	73,260	4,087,912
E16 - Eckel Bass		101,811	101,811	2,087,134		72,573	72,573	1,487,752		72,573	72,573	1,487,752
E17 - Eckel Bass		101,876	101,876	5,980,100		72,619	72,619	4,262,738		72,619	72,619	4,262,738
E19 - Eckel Bass		102,582	102,582	5,375,308		73,123	73,123	3,831,630		73,123	73,123	3,831,630
E18 - Eckel Bass		101,811	101,811	4,001,188		72,573	72,573	2,852,129		72,573	72,573	2,852,129
E20 -Eckel Bass		102,454	102,454	9,589,671		73,031	73,031	6,835,714		73,031	73,031	6,835,714
E35 - Eckel Bass		102,775	102,775	2,117,163		73,260	73,260	1,509,158		73,260	73,260	1,509,158
E38E - Eckel Iles E		89,157	89,157	1,685,072		63,553	63,553	1,201,154		63,553	63,553	1,201,154
E38N (Eckel Iles N)		89,157	89,157	6,981,012		63,553	63,553	4,976,209		63,553	63,553	4,976,209
E38S (Eckel Iles S)		89,157	89,157	7,667,523		63,553	63,553	5,465,568		63,553	63,553	5,465,568
H36 - Ronnie (932)		99,563	99,583	16,756,498		70,971	70,971	11,944,368		70,971	70,971	11,944,368
H37 HolHome (931)		77,338	77,338	3,549,820		55,128	55,128	2,530,385		55,128	55,128	2,530,385

11.2. Amendments

NMP – CNMP AMENDMENTS

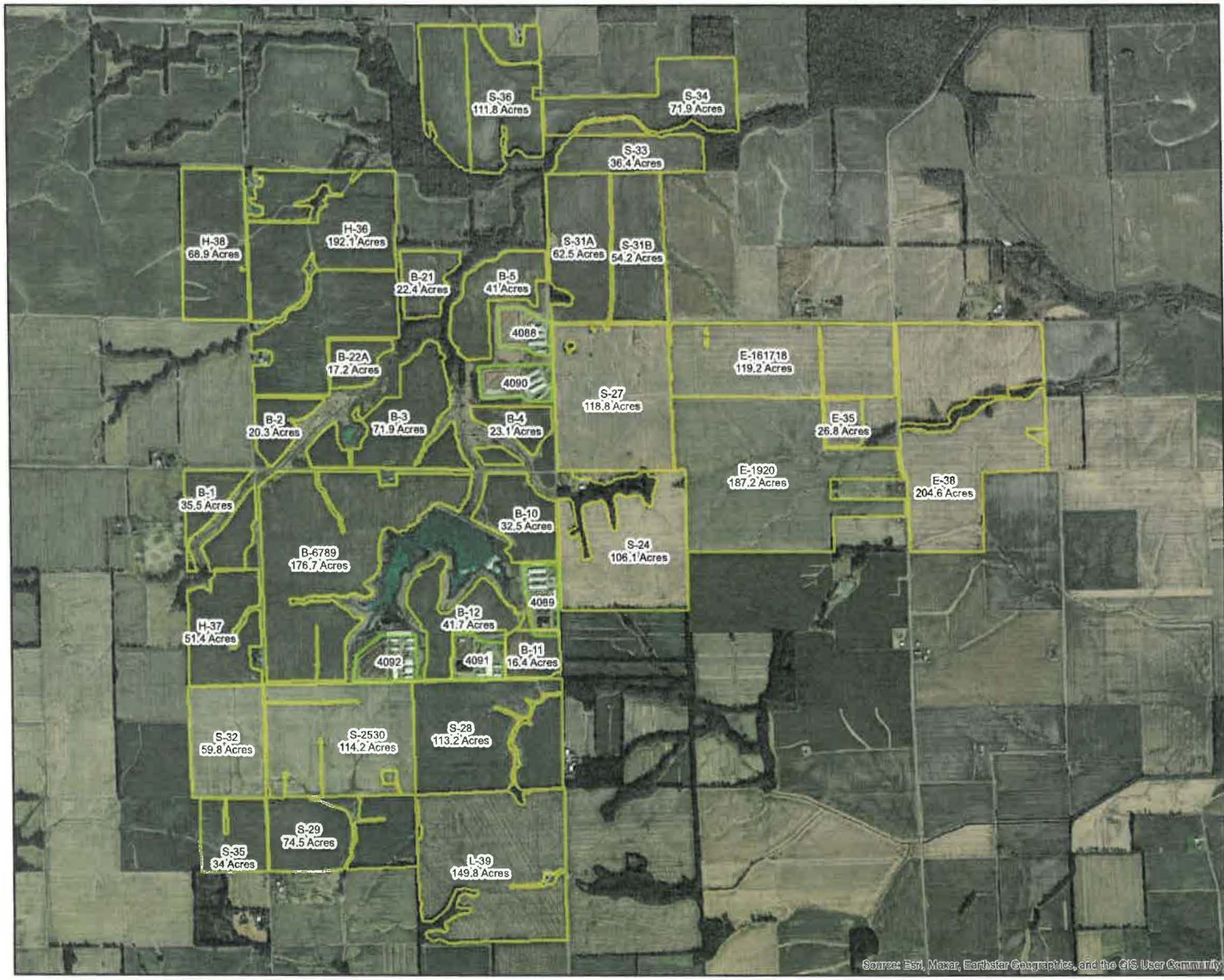
The Nutrient Management Plan should be amended as needed update the plan with present operating conditions. Amendments include but are not limited to: new facility construction, adding land application fields, changing animal production practices, etc. Amendments do not include updating soil tests, manure tests, and reviewing application rates (see NMP Updates section)

Date	Amendment Made	Reviewer
1996	Original NMP for Alliance Farms	TLF
10-19-2000	CNMP for Murphy Farms, bought from Alliance Farms	TLF
6-21-2013	NMP for Murphy Brown, LLC. update with new constructions at Lakeside, Little Wabash, Lakeview, Elm River	TLF
5-7-2019	Add H37, H36 and L39 fields	DNF
3-12-2020	Add S35 and S36 fields	DNF
10-22-2021	Add H38 field	DNF
1-10-2023	Update crop yields, new animal numbers	DNF
5-1-2025	Update crop yields, mortality management, emergency response contacts	DNF

Appendix A. Map(s)

A.1. Aerial Maps

MANURE APPLICATION SETBACK MAP



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ENGINEERS SURVEYORS
maurerstutzinc.com

MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS OVERVIEW

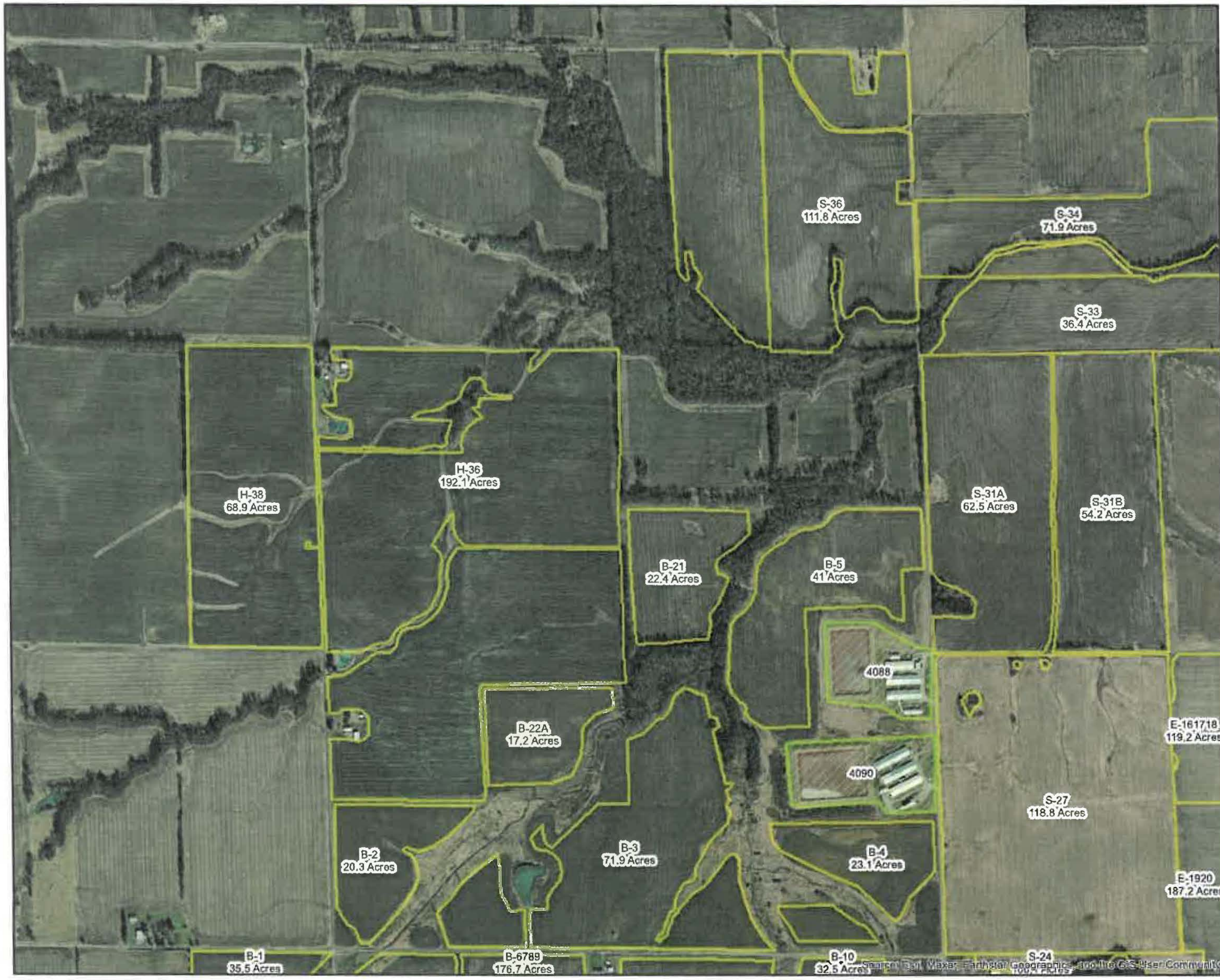
NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

Legend

N

Feet
0 1,700 3,400

MANURE APPLICATION SETBACK MAP



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MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS
T02N R08E S36

NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

Legend

N

Feet
0 840 1,680

MANURE APPLICATION SETBACK MAP

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MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS
T01N R08E S01

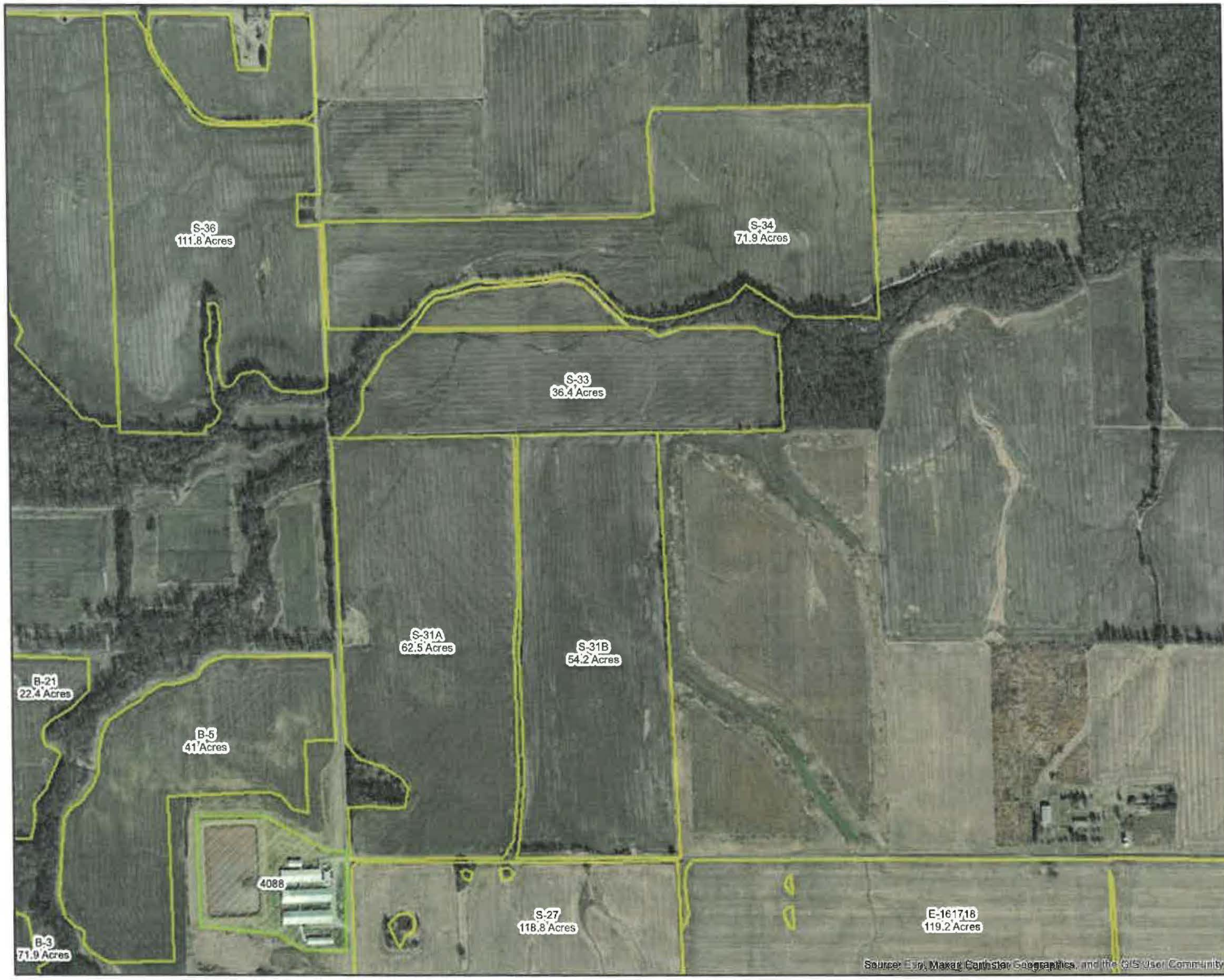
NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

Legend

N

Feet
0 850 1,700

MANURE APPLICATION SETBACK MAP



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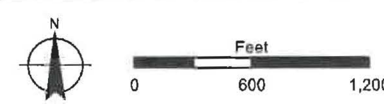
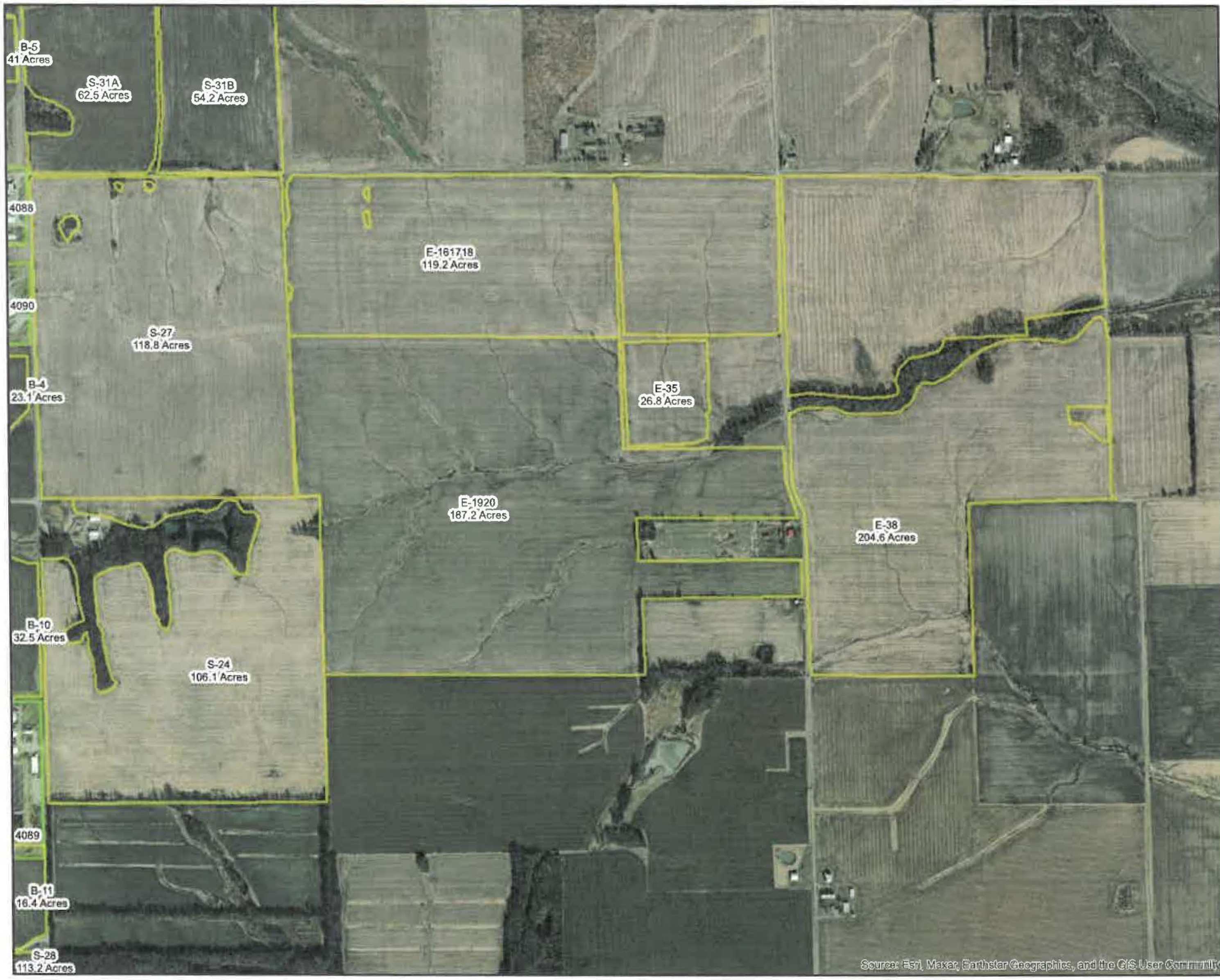
MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS
T02N R09E S30-32

NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

Legend



MANURE APPLICATION SETBACK MAP



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MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS
T02N R09E S31-32, T01N R09E S5-6

NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

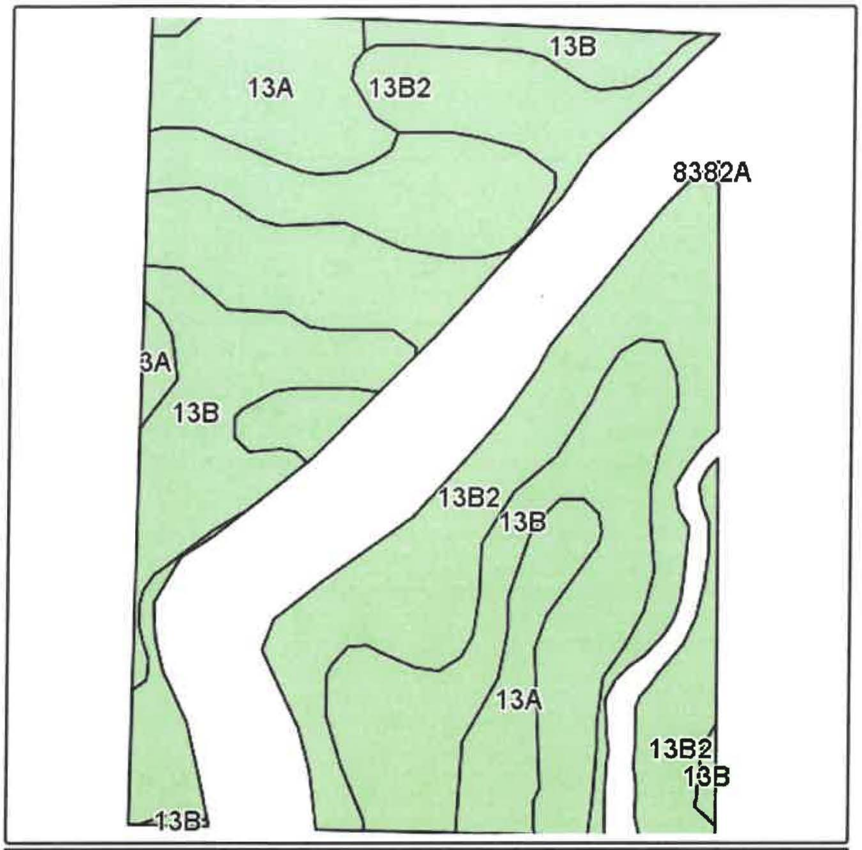
Legend

N

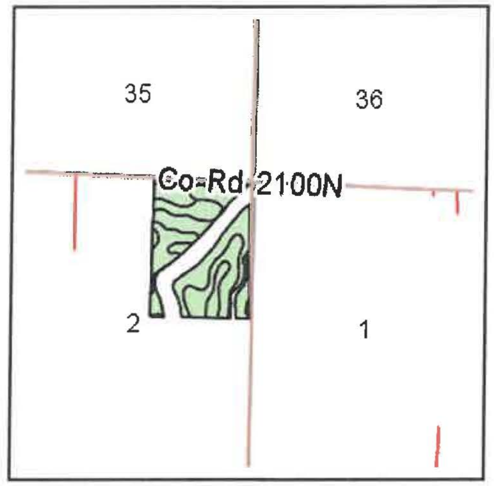
Feet
0 770 1,540

A.2. Soils Maps

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



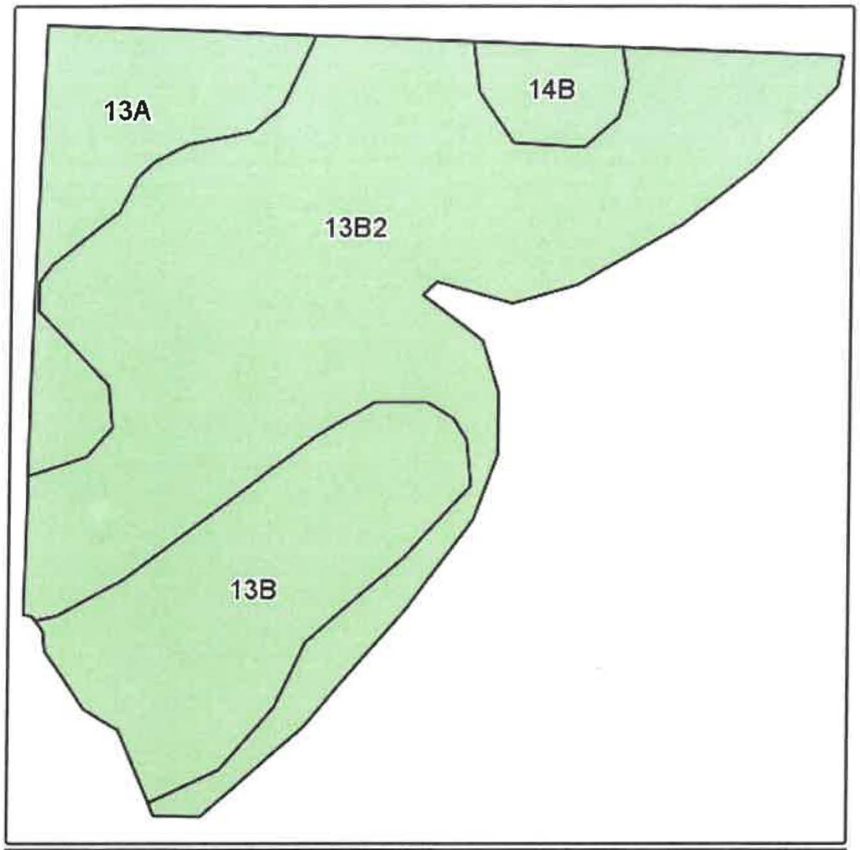
State: **Illinois**
County: **Wayne**
Location: **2-1N-8E**
Township: **Elm River**
Acres: **39.81**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

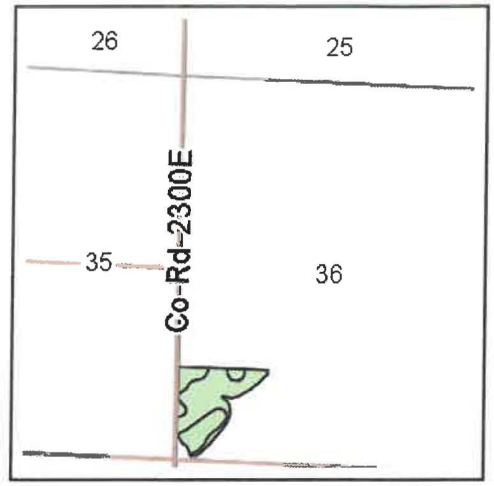
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	17.70	44.5%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
13B	Bluford silt loam, 2 to 5 percent slopes	16.42	41.2%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13A	Bluford silt loam, 0 to 2 percent slopes	5.37	13.5%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
3A	Hoyleton silt loam, 0 to 2 percent slopes	0.32	0.8%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
							Weighted Average	**118.6**	**96.4**	**3**	**4.4**	**38.7**	**48.7**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



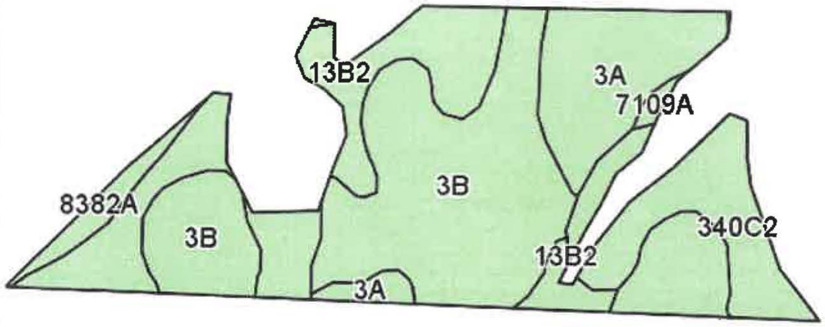
State: **Illinois**
County: **Wayne**
Location: **36-2N-8E**
Township: **Zif**
Acres: **19.63**
Date: **10/11/2013**

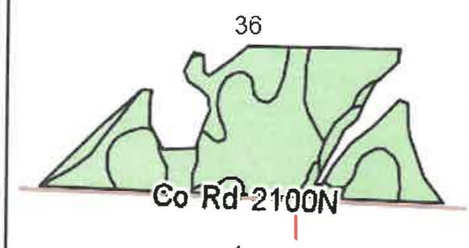
MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by:
surety

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	12.24	62.4%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
13B	Bluford silt loam, 2 to 5 percent slopes	4.16	21.2%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13A	Bluford silt loam, 0 to 2 percent slopes	2.52	12.8%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
14B	Ava silt loam, 2 to 5 percent slopes	0.71	3.6%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
						Weighted Average		**117.8**	**95.5**	**2.9**	**4.3**	**38.5**	**48.5**

Soils Map - B-3





Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

State: **Illinois**
County: **Wayne**
Location: **36-2N-8E**
Township: **Zif**
Acres: **55.08**
Date: **10/29/2013**

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Maps provided by:
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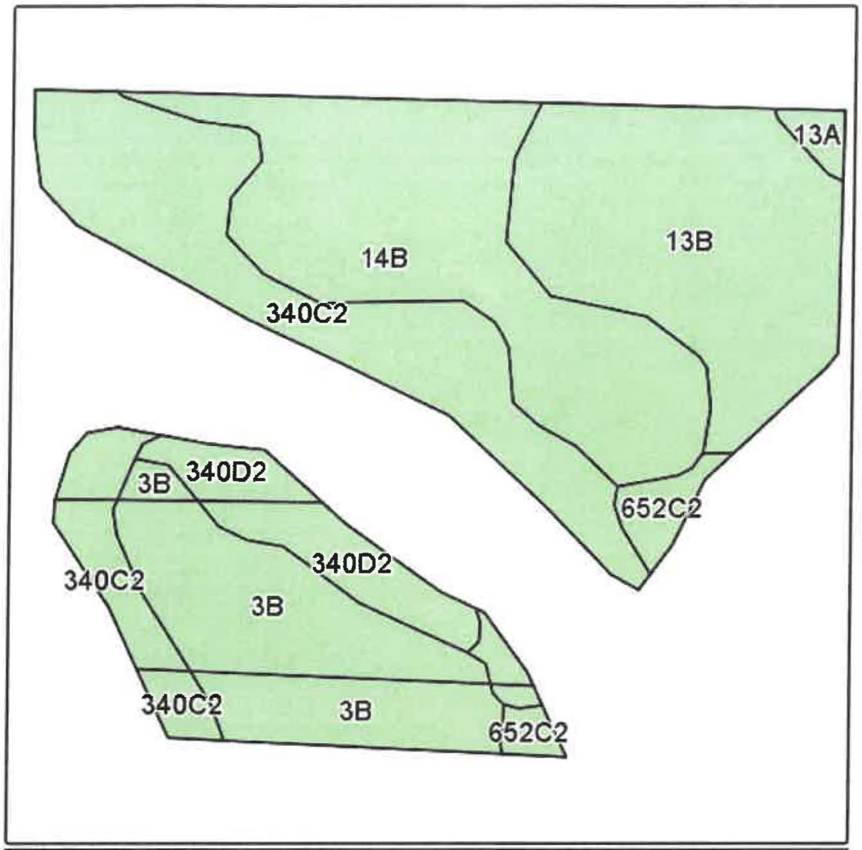
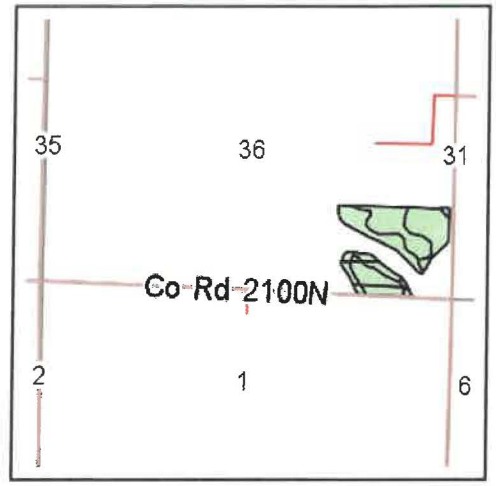
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
3B	Hoyleton silt loam, 2 to 5 percent slopes	24.89	45.2%	2ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIe	131	102	4.1	6.1	42	51
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	12.75	23.1%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
3A	Hoyleton silt loam, 0 to 2 percent slopes	8.14	14.8%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
340C2	Zanesville silt loam, 5 to 10 percent slopes, eroded	7.43	13.5%	2.6ft.	1ft. (Fragipan)	Moderately well drained	IVs	101		3.2	4.6	34	42
8382A	Belknap silt loam, 0 to 2 percent slopes, occasionally flooded	1.52	2.8%	0.7ft.	> 6.5ft.	Somewhat poorly drained	IIw	141		4.4	6.5	47	57
7109A	Racoon silt loam, 0 to 2 percent slopes, rarely flooded	0.35	0.6%	0.5ft.	> 6.5ft.	Poorly drained	IIw	130		3.5	5.2	41	51
						Weighted Average		**123.9**	**83.1**	**3.7**	**5.5**	**40.1**	**49.4**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **36-2N-8E**
Township: **Zif**
Acres: **24.30**
Date: **10/11/2013**

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ENGINEERS SURVEYORS

Maps provided by:
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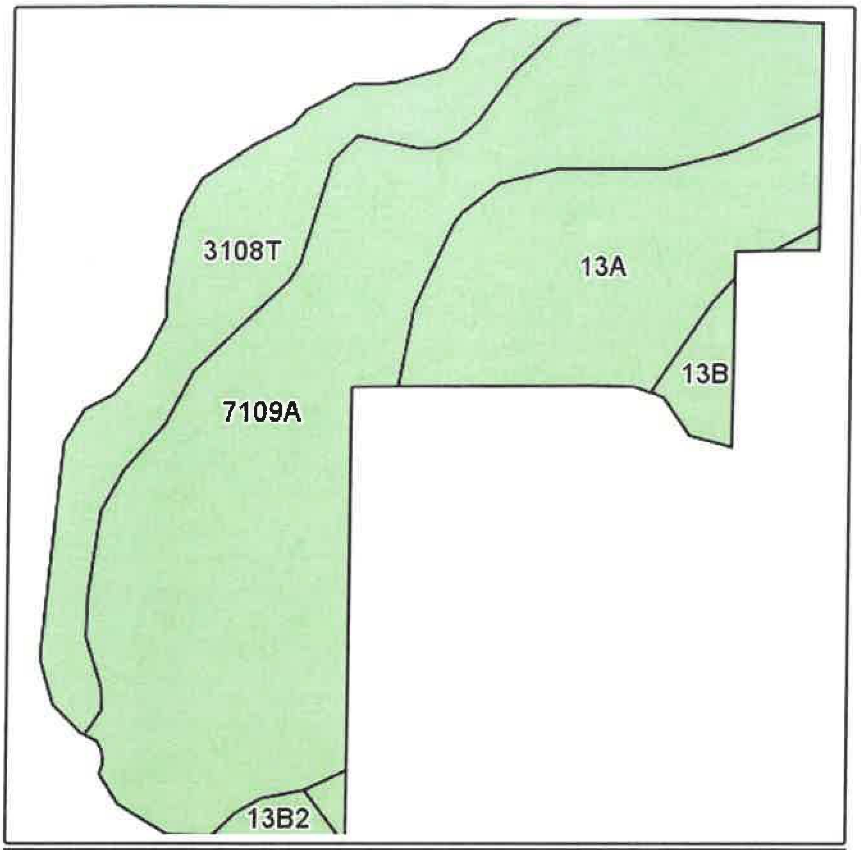
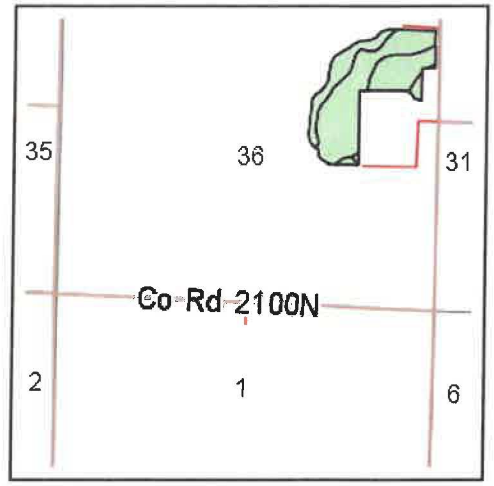
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
14B	Ava silt loam, 2 to 5 percent slopes	6.25	25.7%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
340C2	Zanesville silt loam, 5 to 10 percent slopes, eroded	6.06	24.9%	2.6ft.	1ft. (Fragipan)	Moderately well drained	IVs	101		3.2	4.6	34	42
13B	Bluford silt loam, 2 to 5 percent slopes	5.55	22.8%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
3B	Hoyleton silt loam, 2 to 5 percent slopes	4.11	16.9%	2ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIe	131	102	4.1	6.1	42	51
340D2	Zanesville silt loam, 10 to 18 percent slopes, eroded	1.53	6.3%	2.6ft.	1.5ft. (Fragipan)	Moderately well drained	IVe	94		2.9	4.2	32	39
652C2	Passport silt loam, 5 to 10 percent slopes, eroded	0.59	2.4%	1.5ft.	> 6.5ft.	Somewhat poorly drained	IIIe	105		3.5	5.1	35	47
13A	Bluford silt loam, 0 to 2 percent slopes	0.21	0.9%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
						Weighted Average		**115.1**	**64.9**	**3.2**	**4.7**	**37.7**	**47.2**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **36-2N-8E**
Township: **Zif**
Acres: **39.38**
Date: **10/11/2013**

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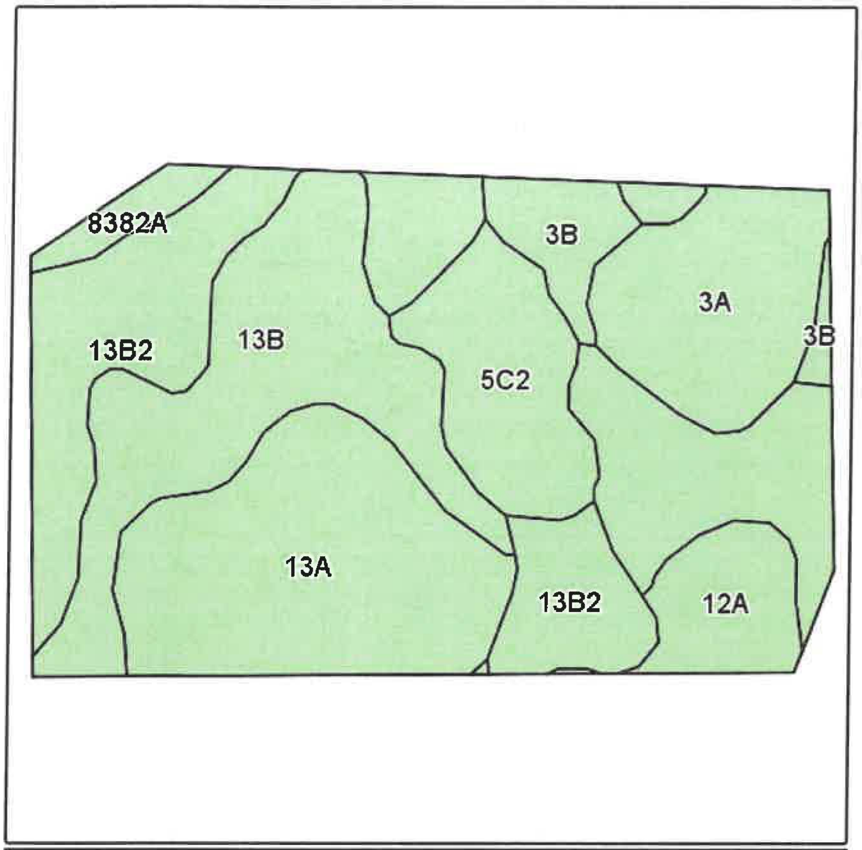
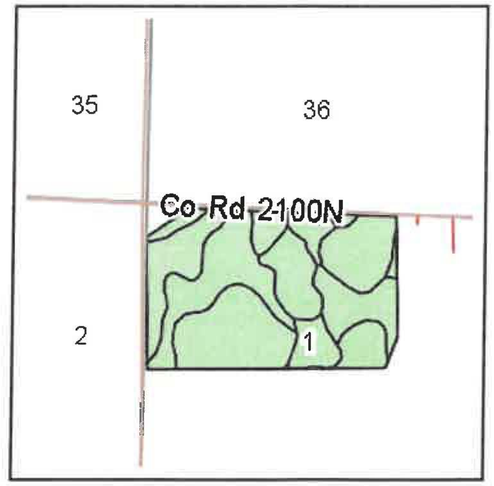
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
7109A	Racoon silt loam, 0 to 2 percent slopes, rarely flooded	22.13	56.2%	0.5ft.	> 6.5ft.	Poorly drained	IIw	130		3.5	5.2	41	51
13A	Bluford silt loam, 0 to 2 percent slopes	8.45	21.5%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	7.20	18.3%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
13B	Bluford silt loam, 2 to 5 percent slopes	0.98	2.5%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	0.43	1.1%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
10C	Plumfield silty clay loam, 5 to 10 percent slopes	0.19	0.5%	2.5ft.	0.4ft. (Fragipan)	Moderately well drained	IVs	93	79	3.1	4.5	31	36
							Weighted Average	**126.1**	**25.1**	**3.4**	**5.1**	**40.5**	**41.3**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



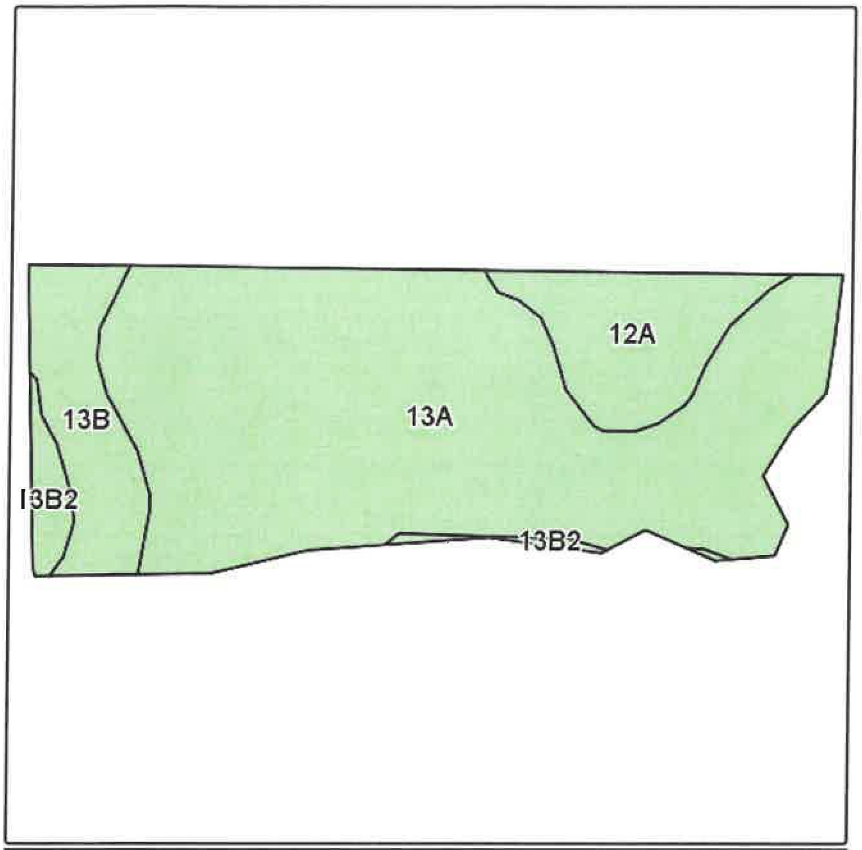
State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **65.08**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

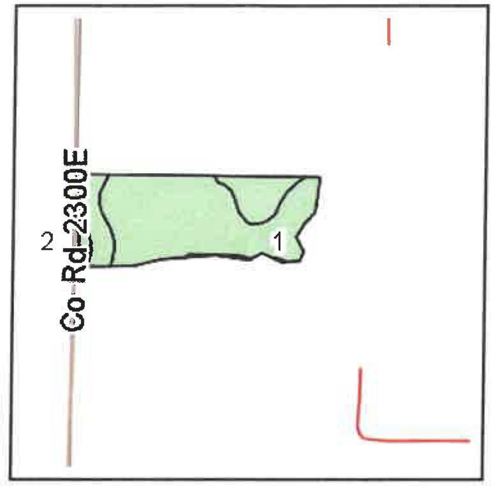
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	19.53	30.0%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	13.15	20.2%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
13B	Bluford silt loam, 2 to 5 percent slopes	12.01	18.5%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
3A	Hoyleton silt loam, 0 to 2 percent slopes	7.17	11.0%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	5.98	9.2%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
12A	Wynoose silt loam, 0 to 2 percent slopes	3.38	5.2%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
3B	Hoyleton silt loam, 2 to 5 percent slopes	2.67	4.1%	2ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIe	131	102	4.1	6.1	42	51
8382A	Belknap silt loam, 0 to 2 percent slopes, occasionally flooded	1.19	1.8%	0.7ft.	> 6.5ft.	Somewhat poorly drained	IIw	141		4.4	6.5	47	57
						Weighted Average		**121.2**	**87.4**	**3.3**	**4.9**	**39.5**	**49.3**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **32.93**
Date: **10/11/2013**

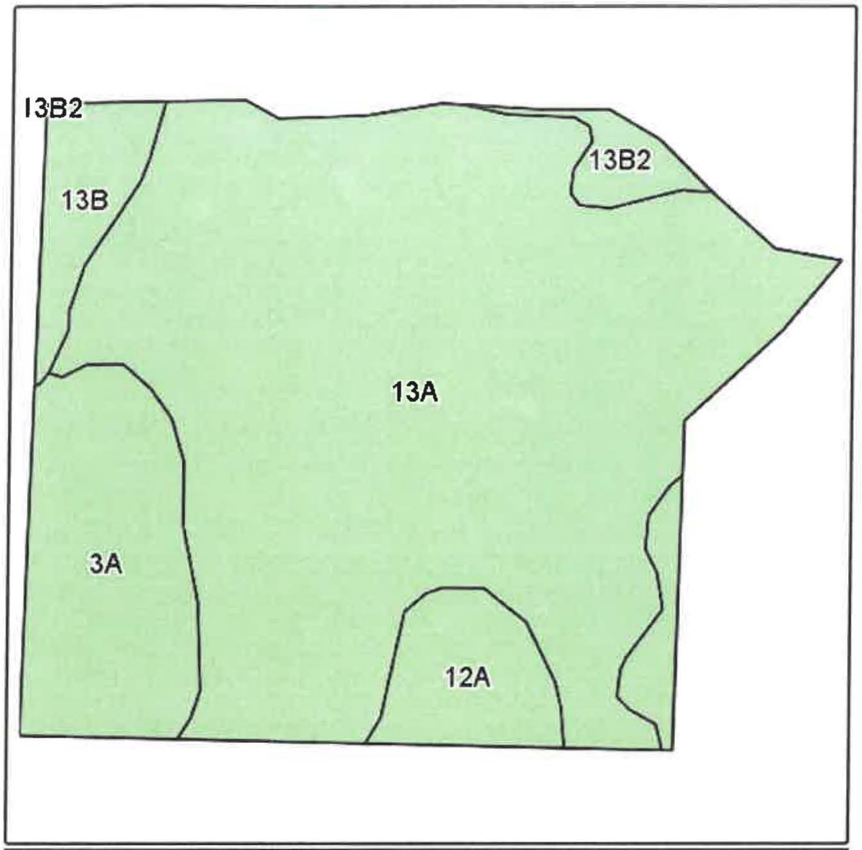
MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by:

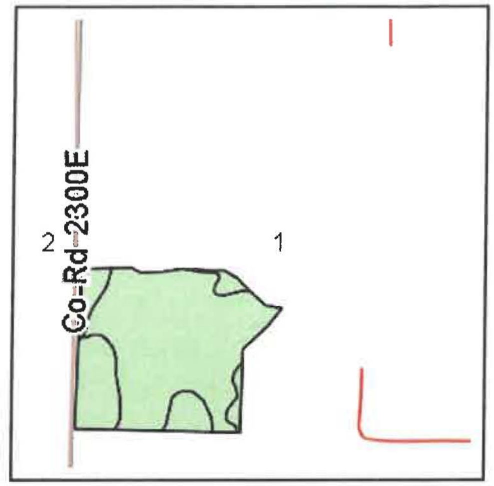
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	24.41	74.1%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
12A	Wynoose silt loam, 0 to 2 percent slopes	3.98	12.1%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
13B	Bluford silt loam, 2 to 5 percent slopes	3.53	10.7%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	1.01	3.1%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
							Weighted Average	**120.8**	**98.5**	**3.1**	**4.6**	**39.6**	**49.3**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



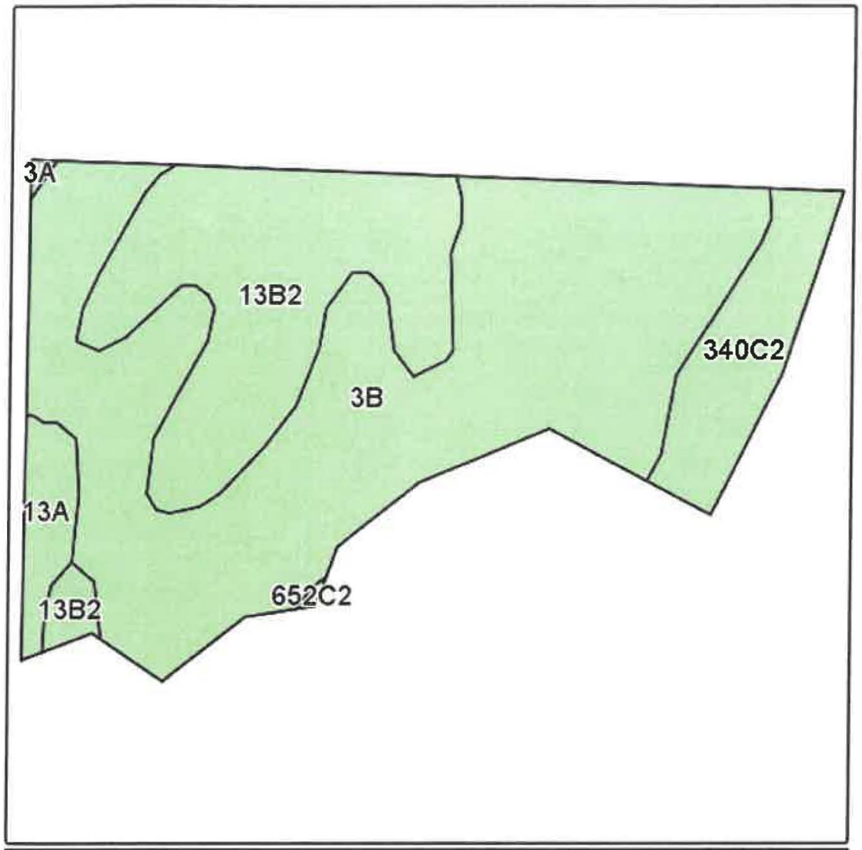
State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **46.23**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

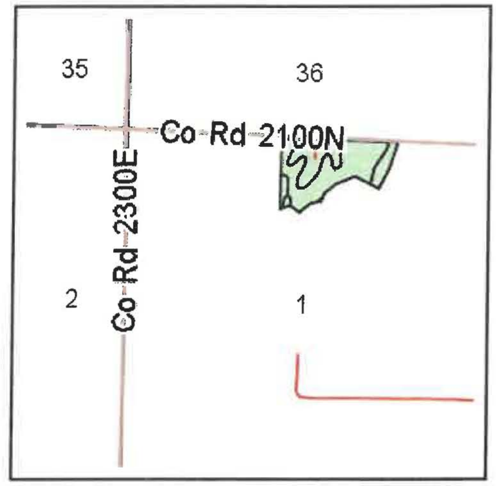
Maps provided by: surety

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	33.80	73.1%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
3A	Hoyleton silt loam, 0 to 2 percent slopes	6.18	13.4%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
12A	Wynoose silt loam, 0 to 2 percent slopes	2.51	5.4%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
13B	Bluford silt loam, 2 to 5 percent slopes	1.90	4.1%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	1.84	4.0%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
						Weighted Average		**122.6**	**99.2**	**3.2**	**4.8**	**40**	**49.9**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



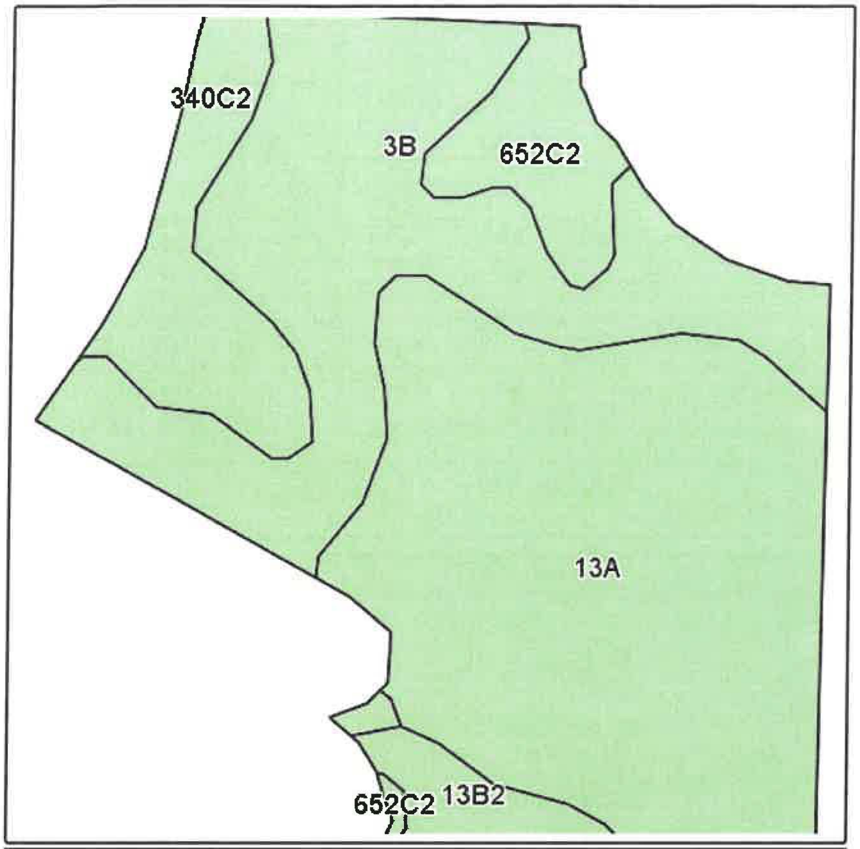
State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **26.09**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

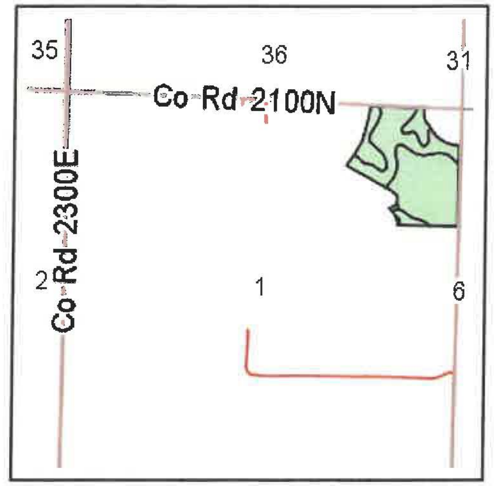
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
3B	Hoyleton silt loam, 2 to 5 percent slopes	15.93	61.1%	2ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIe	131	102	4.1	6.1	42	51
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	6.89	26.4%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
340C2	Zanesville silt loam, 5 to 10 percent slopes, eroded	2.38	9.1%	2.6ft.	1ft. (Fragipan)	Moderately well drained	IVs	101		3.2	4.6	34	42
13A	Bluford silt loam, 0 to 2 percent slopes	0.89	3.4%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
							Weighted Average	**124**	**90.5**	**3.7**	**5.4**	**40.1**	**49.4**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **38.10**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

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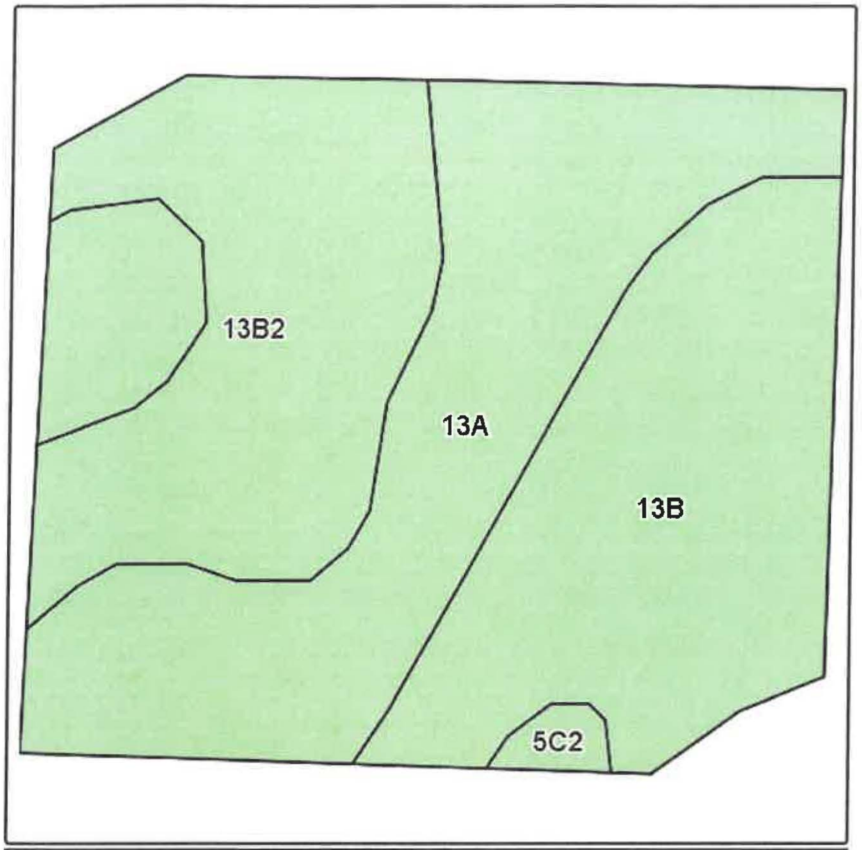
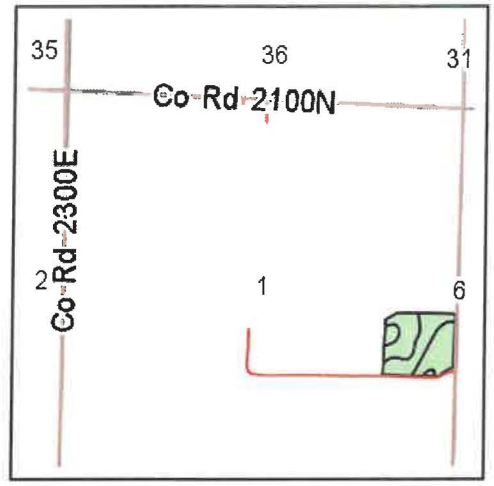
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	18.25	47.9%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
3B	Hoyleton silt loam, 2 to 5 percent slopes	12.66	33.2%	2ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIe	131	102	4.1	6.1	42	51
340C2	Zanesville silt loam, 5 to 10 percent slopes, eroded	3.61	9.5%	2.6ft.	1ft. (Fragipan)	Moderately well drained	IVs	101		3.2	4.6	34	42
652C2	Passport silt loam, 5 to 10 percent slopes, eroded	2.42	6.4%	1.5ft.	> 6.5ft.	Somewhat poorly drained	IIIe	105		3.5	5.1	35	47
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	1.16	3.0%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
							Weighted Average	**121.7**	**84.2**	**3.4**	**5.1**	**39.7**	**49.3**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **18.04**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

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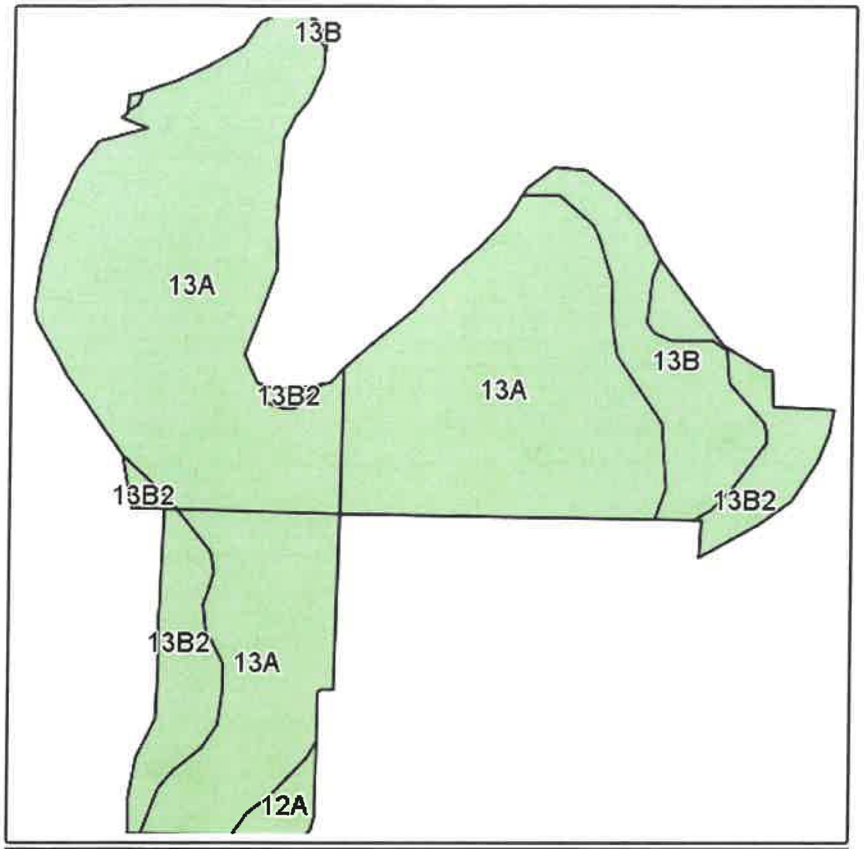
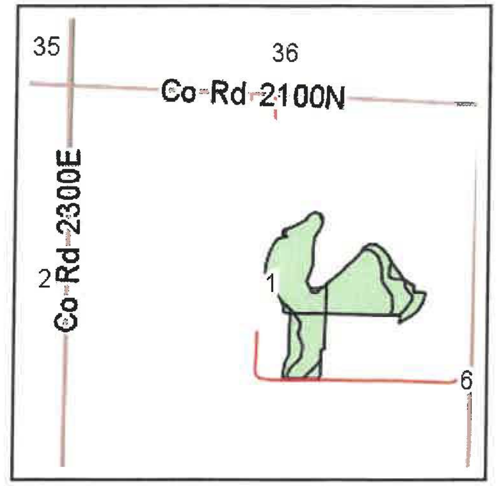
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	7.20	39.9%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B	Bluford silt loam, 2 to 5 percent slopes	5.63	31.2%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	5.00	27.7%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	0.21	1.2%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
						Weighted Average		**119.6**	**96.1**	**3**	**4.4**	**39.1**	**49.1**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **41.91**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

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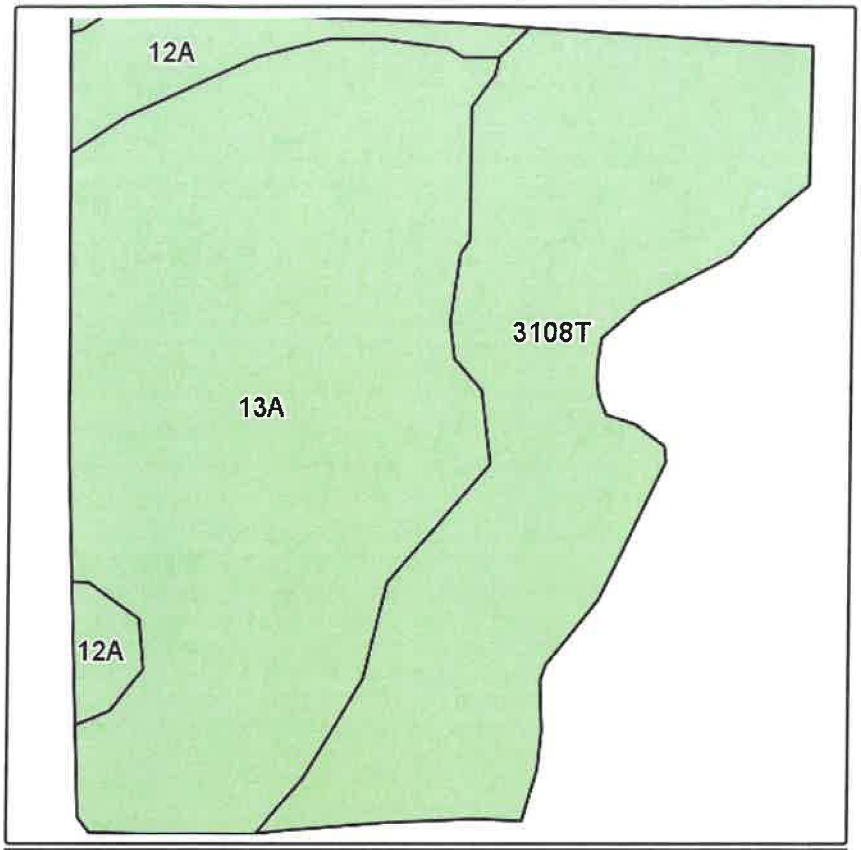
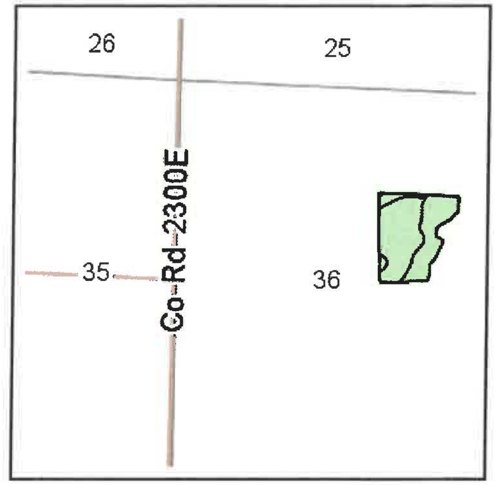
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	32.67	78.0%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	4.81	11.5%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
13B	Bluford silt loam, 2 to 5 percent slopes	3.86	9.2%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
12A	Wynoose silt loam, 0 to 2 percent slopes	0.57	1.4%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
						Weighted Average		**121**	**98.3**	**3**	**4.5**	**39.7**	**49.6**

Soils Map





State:	**Illinois**
County:	**Wayne**
Location:	**36-2N-8E**
Township:	**Zif**
Acres:	**22.12**
Date:	**10/11/2013**

MAURER-STUTZ
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Maps provided by:
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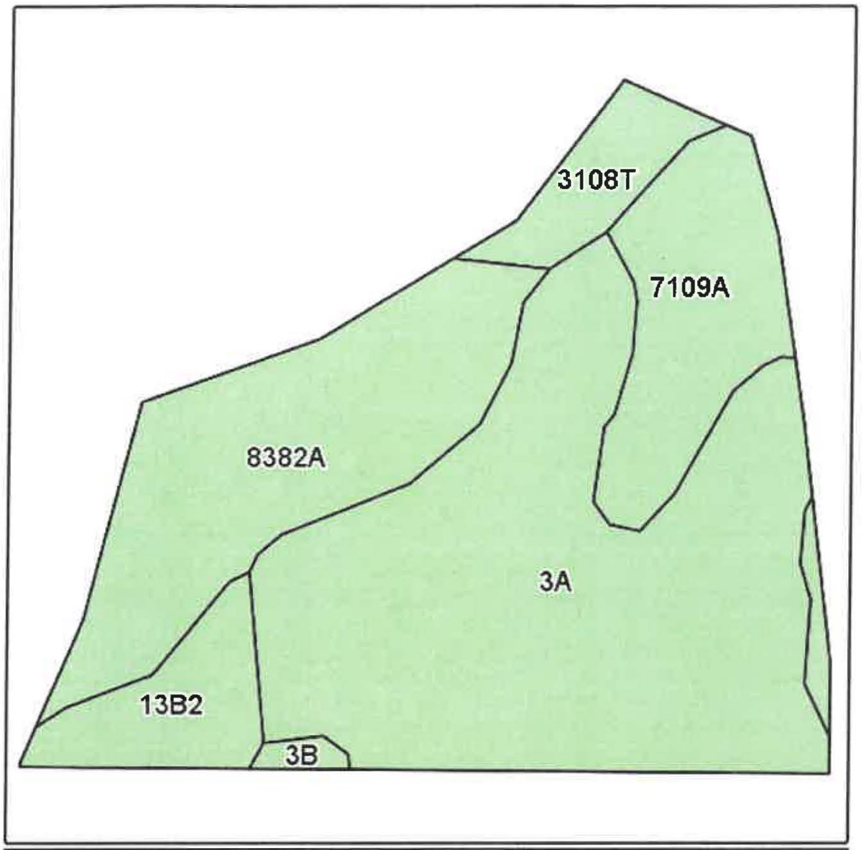
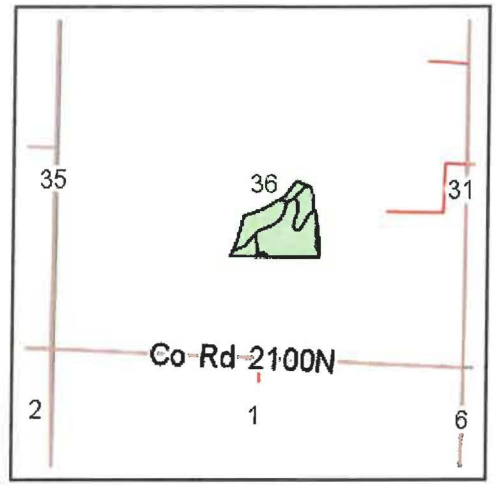
Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	12.28	55.5%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	8.42	38.1%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
12A	Wynoose silt loam, 0 to 2 percent slopes	1.42	6.4%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
							Weighted Average	**121.2**	**61.2**	**3.4**	**5**	**39.9**	**30.7**

Soils Map - B-22





Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

State:	**Illinois**
County:	**Wayne**
Location:	**36-2N-8E**
Township:	**Zif**
Acres:	**17.14**
Date:	**10/29/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by:
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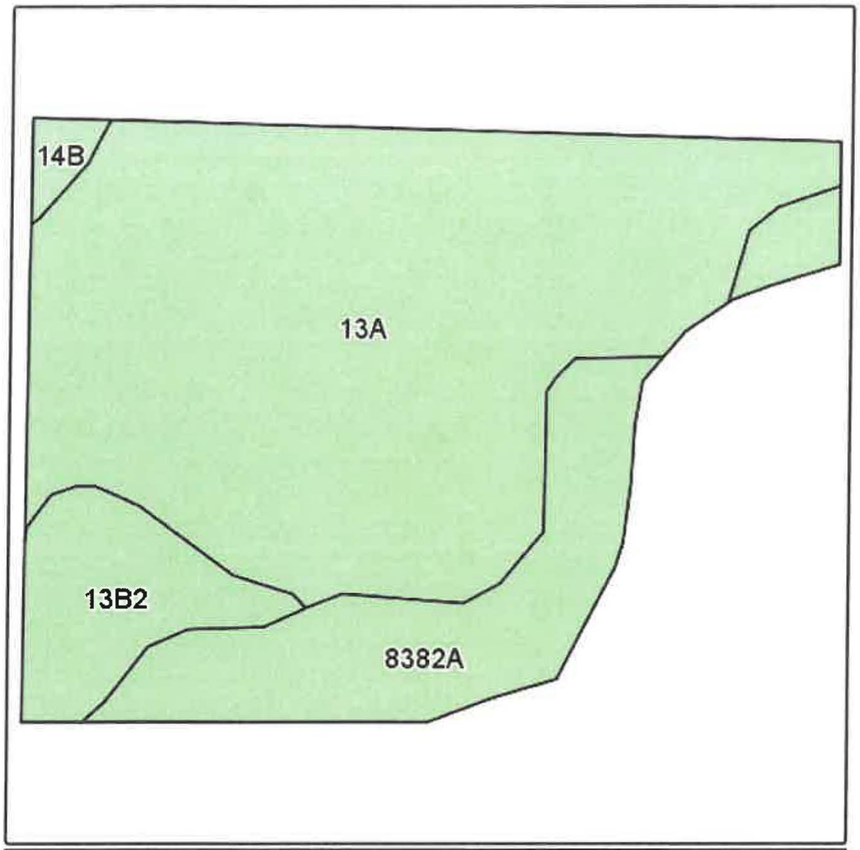
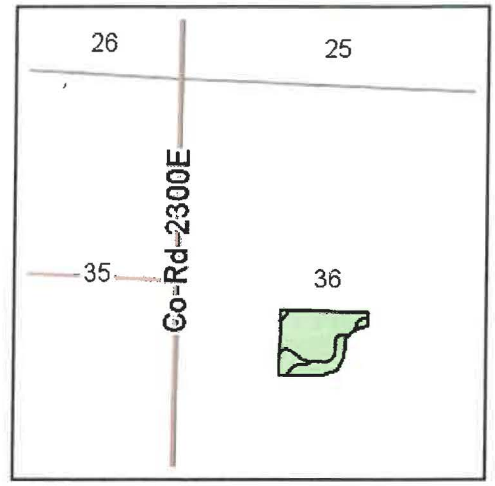
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
3A	Hoyleton silt loam, 0 to 2 percent slopes	8.69	50.7%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
8382A	Belknap silt loam, 0 to 2 percent slopes, occasionally flooded	4.01	23.4%	0.7ft.	> 6.5ft.	Somewhat poorly drained	IIw	141		4.4	6.5	47	57
7109A	Racoon silt loam, 0 to 2 percent slopes, rarely flooded	2.36	13.8%	0.5ft.	> 6.5ft.	Poorly drained	IIw	130		3.5	5.2	41	51
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	1.12	6.5%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	0.84	4.9%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
3B	Hoyleton silt loam, 2 to 5 percent slopes	0.12	0.7%	2ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIe	131	102	4.1	6.1	42	51
							Weighted Average	**132.2**	**59.1**	**4**	**6**	**42.7**	**50.2**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **36-2N-8E**
Township: **Zif**
Acres: **17.17**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by:
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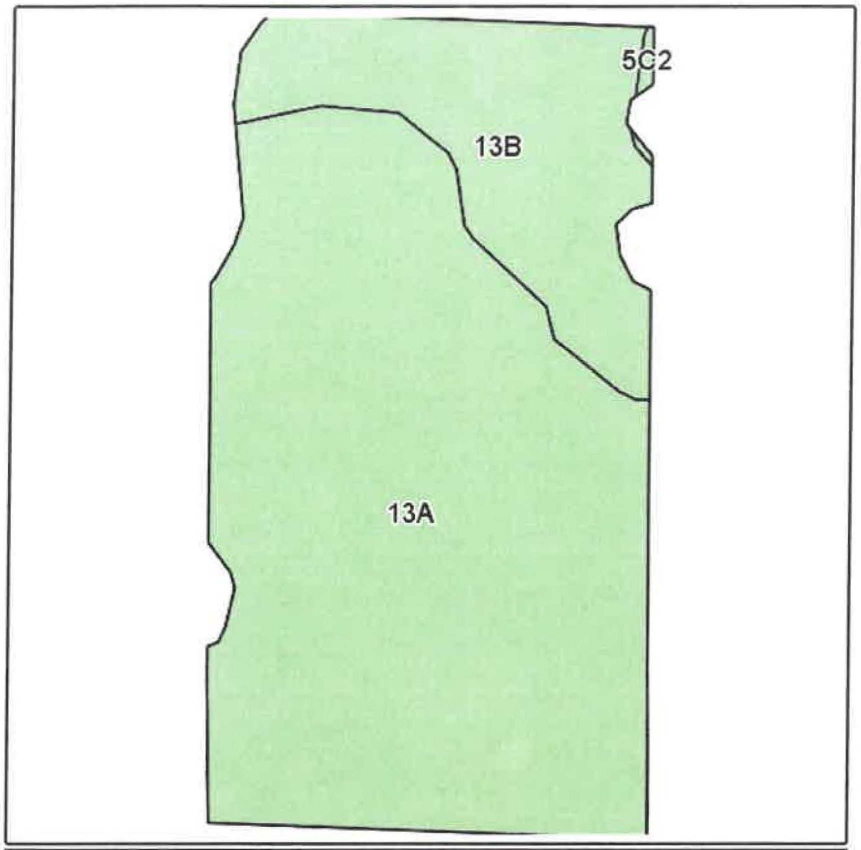
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	11.98	69.8%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
8382A	Belknap silt loam, 0 to 2 percent slopes, occasionally flooded	3.39	19.7%	0.7ft.	> 6.5ft.	Somewhat poorly drained	IIw	141		4.4	6.5	47	57
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	1.59	9.3%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
14B	Ava silt loam, 2 to 5 percent slopes	0.21	1.2%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
						Weighted Average		**125.2**	**78.9**	**3.3**	**4.9**	**41.2**	**51.2**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

State: **Illinois**
County: **Wayne**
Location: **31-2N-9E**
Township: **Mount Erie**
Acres: **20.24**
Date: **10/11/2013**

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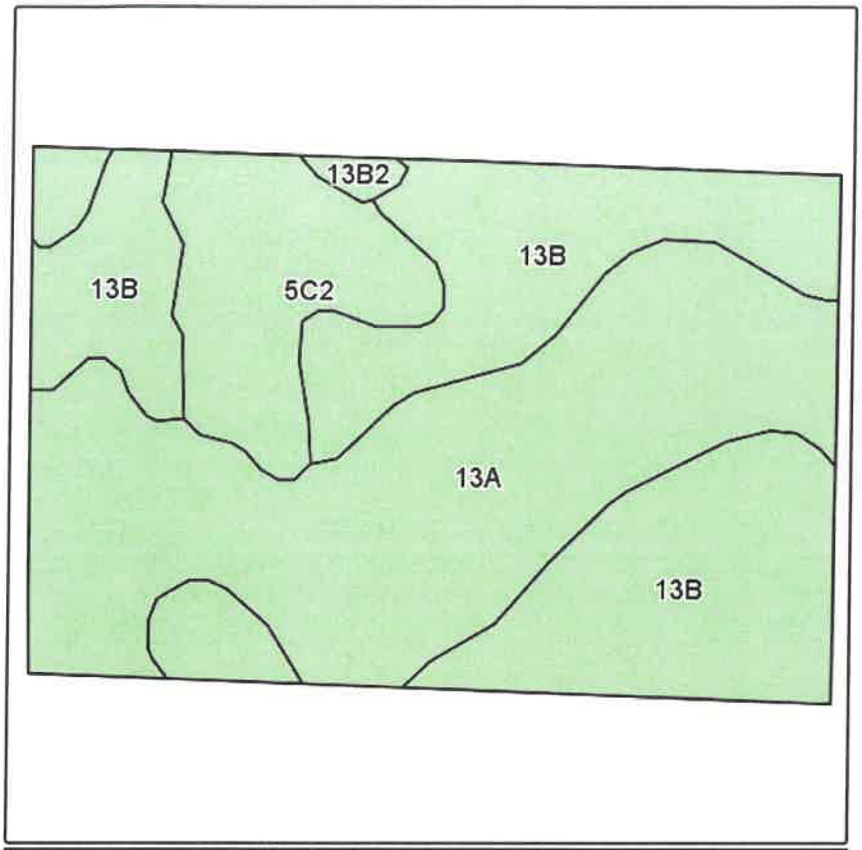
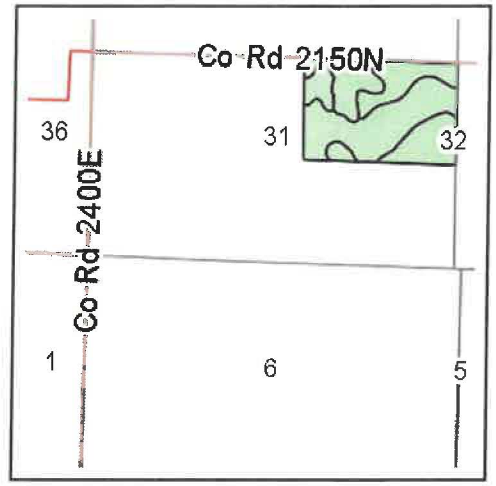
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	15.73	77.7%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B	Bluford silt loam, 2 to 5 percent slopes	4.45	22.0%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	0.06	0.3%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
							Weighted Average	**121.5**	**98.5**	**3**	**4.5**	**39.8**	**49.8**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State:	**Illinois**
County:	**Wayne**
Location:	**31-2N-9E**
Township:	**Mount Erie**
Acres:	**59.77**
Date:	**10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by:
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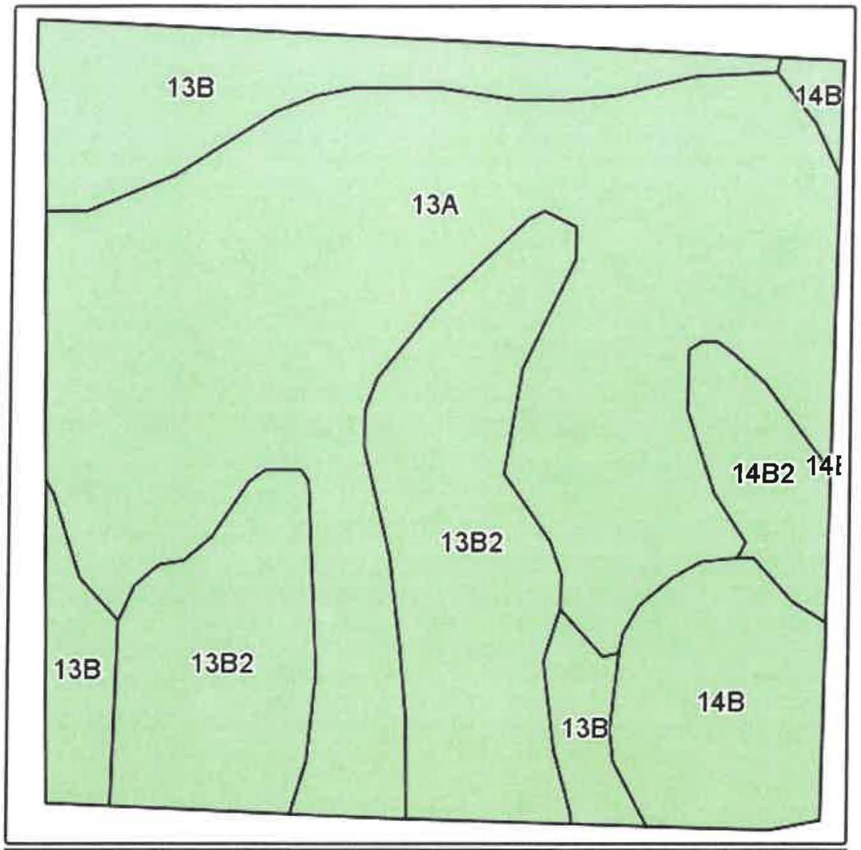
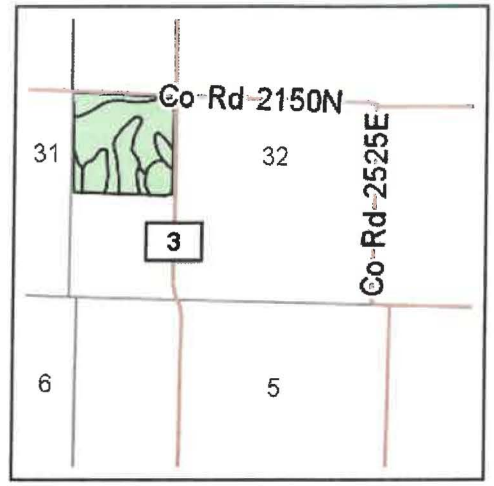
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13B	Bluford silt loam, 2 to 5 percent slopes	25.79	43.1%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13A	Bluford silt loam, 0 to 2 percent slopes	25.29	42.3%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	8.26	13.8%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	0.43	0.7%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
							Weighted Average	**120.1**	**84.9**	**3.1**	**4.6**	**39.1**	**49.1**

Soils Map





Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

State: **Illinois**
County: **Wayne**
Location: **32-2N-9E**
Township: **Mount Erie**
Acres: **38.34**
Date: **10/11/2013**

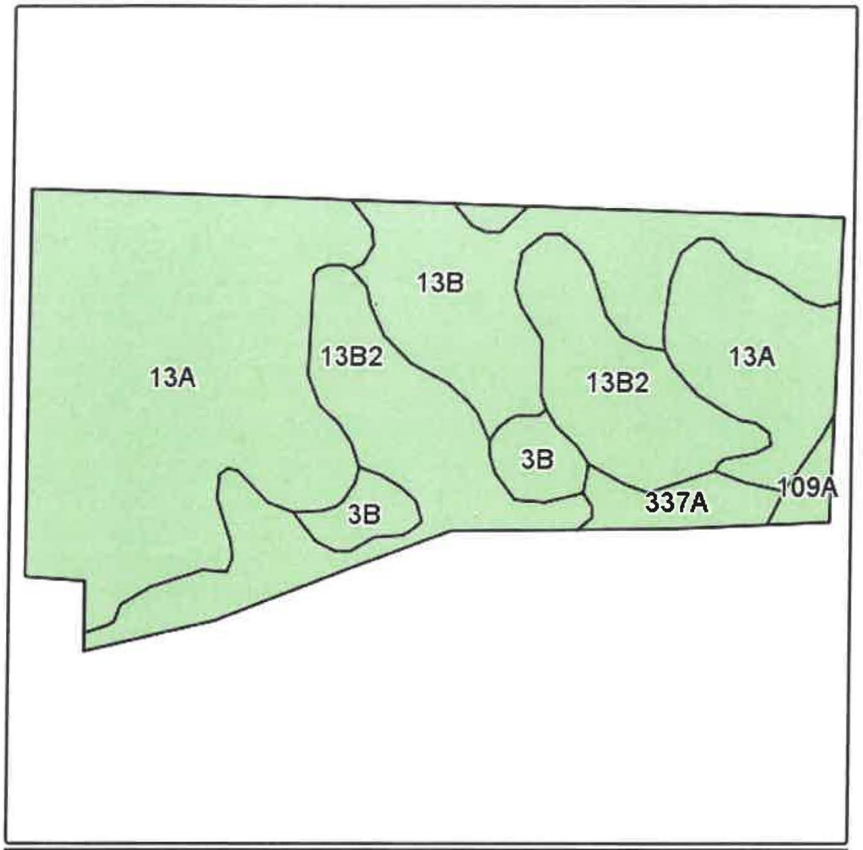
MAURER-STUTZ
ENGINEERS SURVEYORS

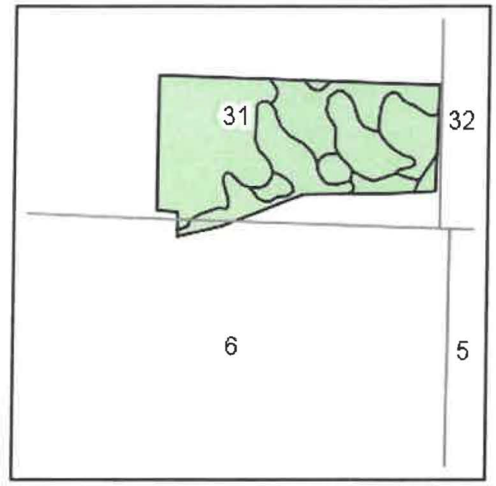
Maps provided by:

surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	19.47	50.8%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	8.70	22.7%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
13B	Bluford silt loam, 2 to 5 percent slopes	5.40	14.1%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
14B	Ava silt loam, 2 to 5 percent slopes	3.34	8.7%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
14B2	Ava silt loam, 2 to 5 percent slopes, eroded	1.43	3.7%	1.8ft.	2.5ft. (Fragipan)	Moderately well drained	IIIs	113	88	2.7	3.9	36	46
							Weighted Average	**119.8**	**97**	**3**	**4.4**	**39.2**	**49.3**

Soils Map





Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

State: **Illinois**
County: **Wayne**
Location: **6-1N-9E**
Township: **Mount Erie**
Acres: **71.90**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by:

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CUSTOMIZED ONLINE MAPPING

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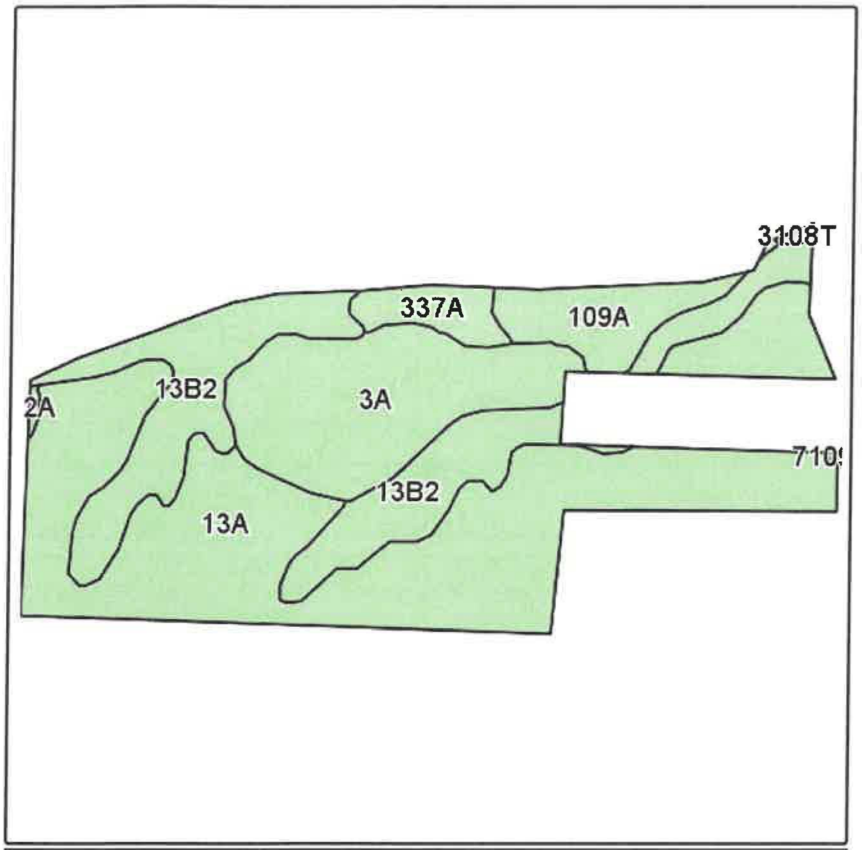
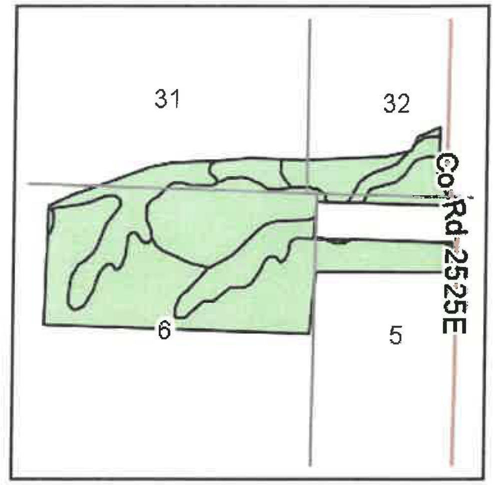
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	34.62	48.2%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	18.78	26.1%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
13B	Bluford silt loam, 2 to 5 percent slopes	12.45	17.3%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
3B	Hoyleton silt loam, 2 to 5 percent slopes	3.02	4.2%	2ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIe	131	102	4.1	6.1	42	51
337A	Creal silt loam, 0 to 2 percent slopes	2.17	3.0%	2ft.	> 6.5ft.	Somewhat poorly drained	IIw	136	106	3.6	5.3	43	53
109A	Racoon silt loam, 0 to 2 percent slopes	0.86	1.2%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	130		3.5	5.2	41	51
							Weighted Average	**121**	**96.7**	**3**	**4.5**	**39.5**	**49.4**

Soils Map





State: **Illinois**
County: **Wayne**
Location: **6-1N-9E**
Township: **Mount Erie**
Acres: **113.18**
Date: **10/11/2013**

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ENGINEERS SURVEYORS

Maps provided by:
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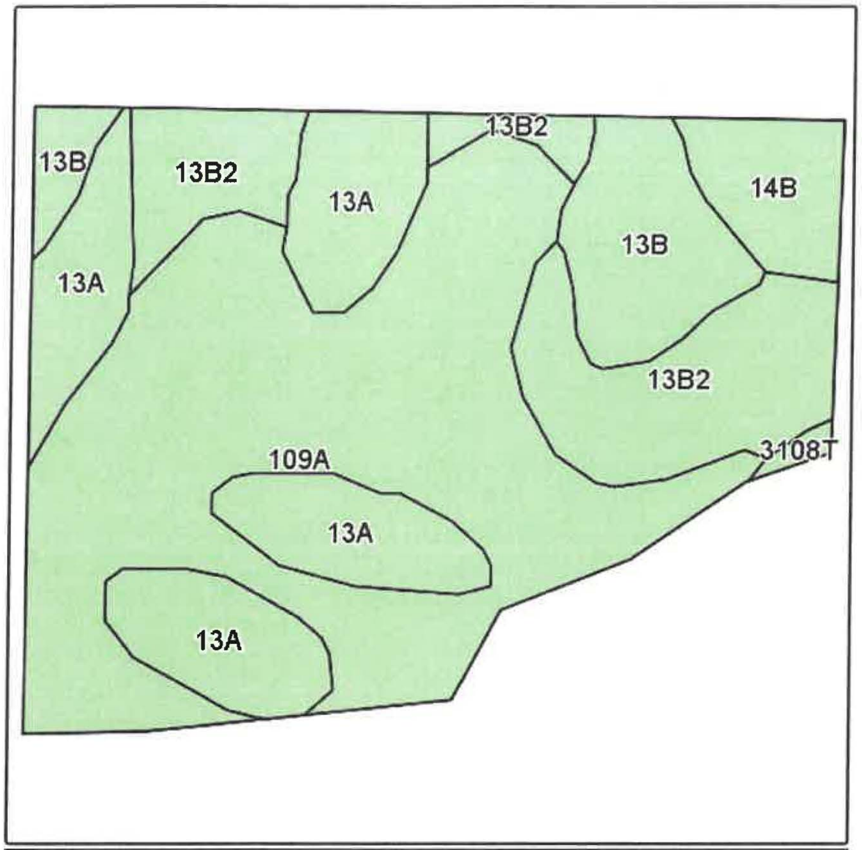
CUSTOMIZED ONLINE MAPPING

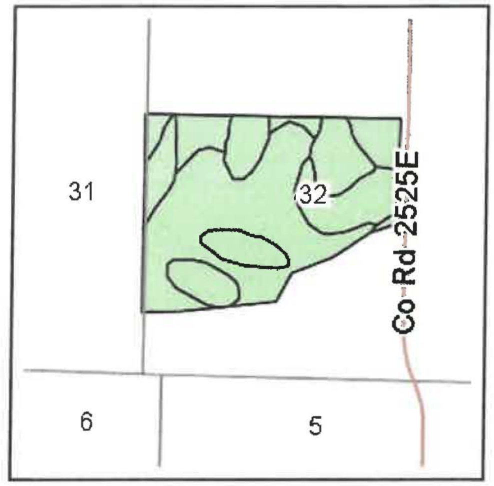
Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	55.36	48.9%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	26.46	23.4%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
3A	Hoyleton silt loam, 0 to 2 percent slopes	20.51	18.1%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
109A	Racoon silt loam, 0 to 2 percent slopes	6.87	6.1%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	130		3.5	5.2	41	51
337A	Creal silt loam, 0 to 2 percent slopes	3.53	3.1%	2ft.	> 6.5ft.	Somewhat poorly drained	IIw	136	106	3.6	5.3	43	53
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	0.23	0.2%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
12A	Wynoose silt loam, 0 to 2 percent slopes	0.22	0.2%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
						Weighted Average		**123.3**	**92.6**	**3.2**	**4.8**	**40**	**49.9**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **32-2N-9E**
Township: **Mount Erie**
Acres: **26.06**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

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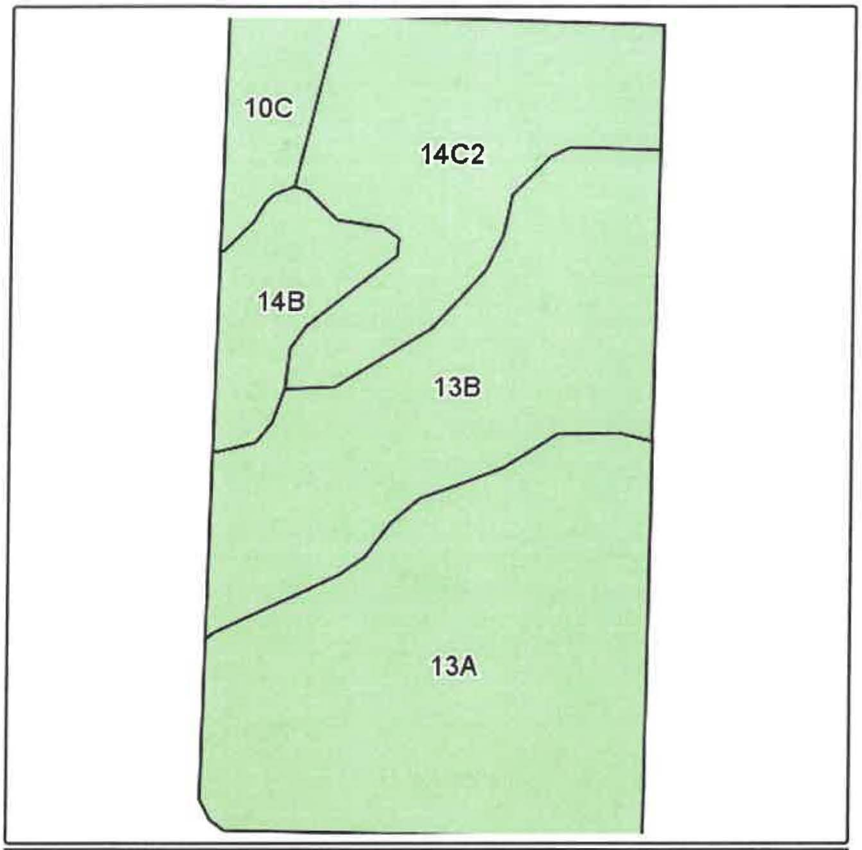
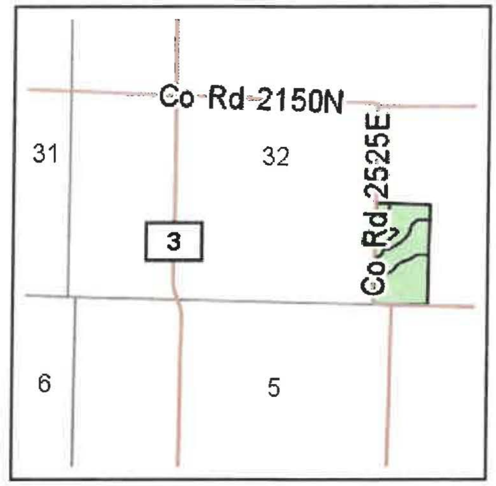
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
109A	Racoon silt loam, 0 to 2 percent slopes	12.25	47.0%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	130		3.5	5.2	41	51
13A	Bluford silt loam, 0 to 2 percent slopes	5.46	21.0%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	4.50	17.3%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
13B	Bluford silt loam, 2 to 5 percent slopes	2.48	9.5%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
14B	Ava silt loam, 2 to 5 percent slopes	1.25	4.8%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	0.12	0.5%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
						Weighted Average		**124.4**	**50.9**	**3.2**	**4.8**	**40**	**49.8**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **32-2N-9E**
Township: **Mount Erie**
Acres: **21.06**
Date: **10/11/2013**

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ENGINEERS SURVEYORS

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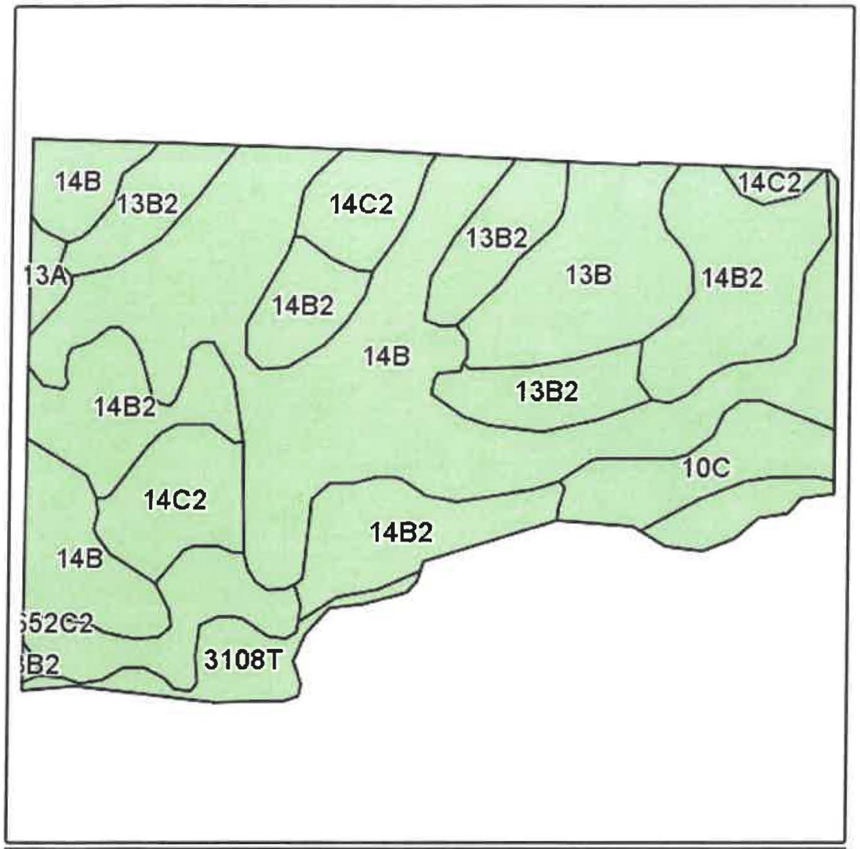
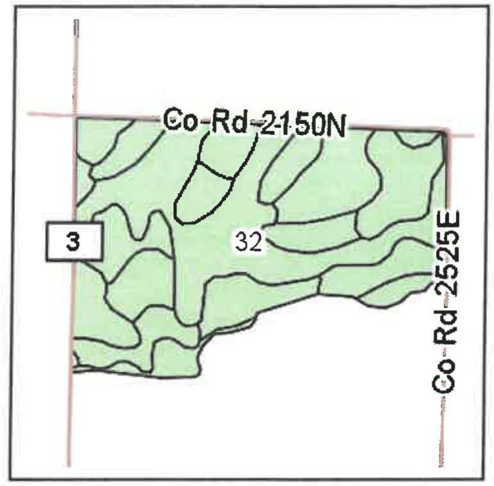
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	8.28	39.3%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B	Bluford silt loam, 2 to 5 percent slopes	5.75	27.3%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
14C2	Ava silt loam, 5 to 10 percent slopes, eroded	4.57	21.7%	2.2ft.	2.6ft. (Fragipan)	Moderately well drained	IIIe	108	85	2.6	3.8	35	45
14B	Ava silt loam, 2 to 5 percent slopes	1.43	6.8%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
10C	Plumfield silty clay loam, 5 to 10 percent slopes	1.03	4.9%	2.5ft.	0.4ft. (Fragipan)	Moderately well drained	IVs	93	79	3.1	4.5	31	36
						Weighted Average		**116.9**	**94.4**	**2.9**	**4.3**	**38.1**	**48**

Soils Map





State: **Illinois**
County: **Wayne**
Location: **32-2N-9E**
Township: **Mount Erie**
Acres: **85.11**
Date: **10/11/2013**

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ENGINEERS SURVEYORS

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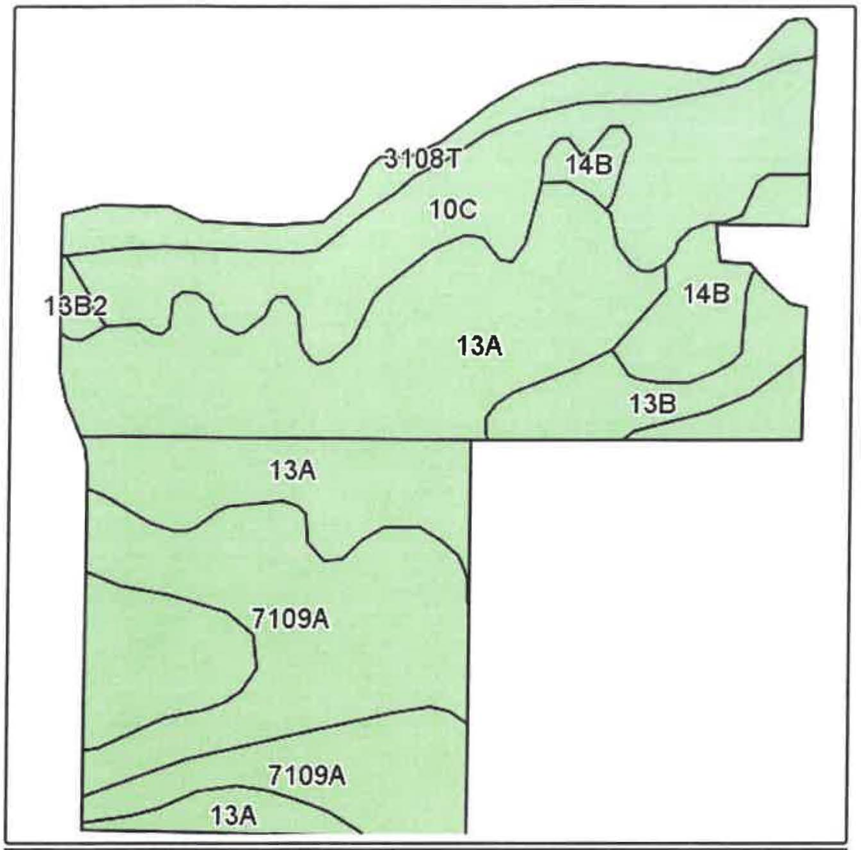
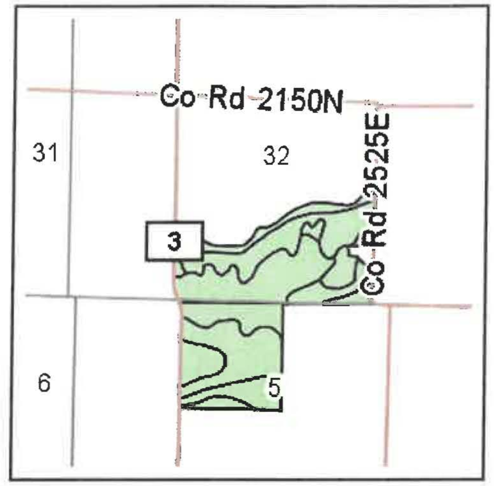
Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
14B	Ava silt loam, 2 to 5 percent slopes	31.56	37.1%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
14B2	Ava silt loam, 2 to 5 percent slopes, eroded	17.82	20.9%	1.8ft.	2.5ft. (Fragipan)	Moderately well drained	IIIs	113	88	2.7	3.9	36	46
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	8.19	9.6%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
13B	Bluford silt loam, 2 to 5 percent slopes	7.27	8.5%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
14C2	Ava silt loam, 5 to 10 percent slopes, eroded	7.16	8.4%	2.2ft.	2.6ft. (Fragipan)	Moderately well drained	IIIe	108	85	2.6	3.8	35	45
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	4.31	5.1%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
10C	Plumfield silty clay loam, 5 to 10 percent slopes	4.14	4.9%	2.5ft.	0.4ft. (Fragipan)	Moderately well drained	IVs	93	79	3.1	4.5	31	36
652C2	Passport silt loam, 5 to 10 percent slopes, eroded	3.95	4.6%	1.5ft.	> 6.5ft.	Somewhat poorly drained	IIIe	105		3.5	5.1	35	47
13A	Bluford silt loam, 0 to 2 percent slopes	0.71	0.8%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
							Weighted Average	**115.2**	**82.9**	**2.9**	**4.3**	**37.4**	**45.1**

Soils Map





State: **Illinois**
County: **Wayne**
Location: **32-2N-9E**
Township: **Mount Erie**
Acres: **102.88**
Date: **10/11/2013**

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ENGINEERS SURVEYORS

Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

Maps provided by:
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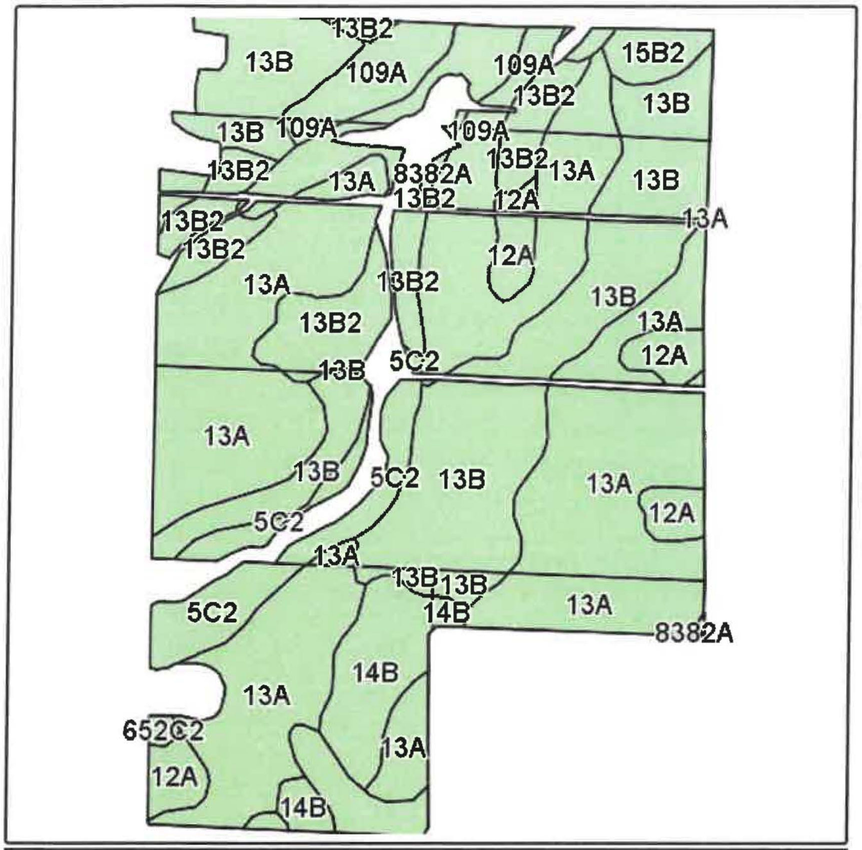
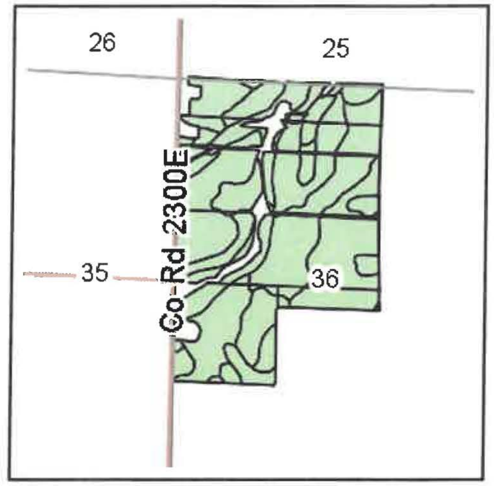
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	40.77	39.6%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
7109A	Racoon silt loam, 0 to 2 percent slopes, rarely flooded	24.97	24.3%	0.5ft.	> 6.5ft.	Poorly drained	IIw	130		3.5	5.2	41	51
10C	Plumfield silty clay loam, 5 to 10 percent slopes	19.01	18.5%	2.5ft.	0.4ft. (Fragipan)	Moderately well drained	IVs	93	79	3.1	4.5	31	36
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	6.65	6.5%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
14B	Ava silt loam, 2 to 5 percent slopes	5.63	5.5%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
13B	Bluford silt loam, 2 to 5 percent slopes	5.27	5.1%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	0.58	0.6%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
							Weighted Average	**118.3**	**64.6**	**3.2**	**4.7**	**38.5**	**44.4**

Soils Map



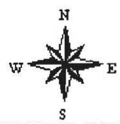
Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **36-2N-8E**
Township: **Zif**
Acres: **192.26**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by:



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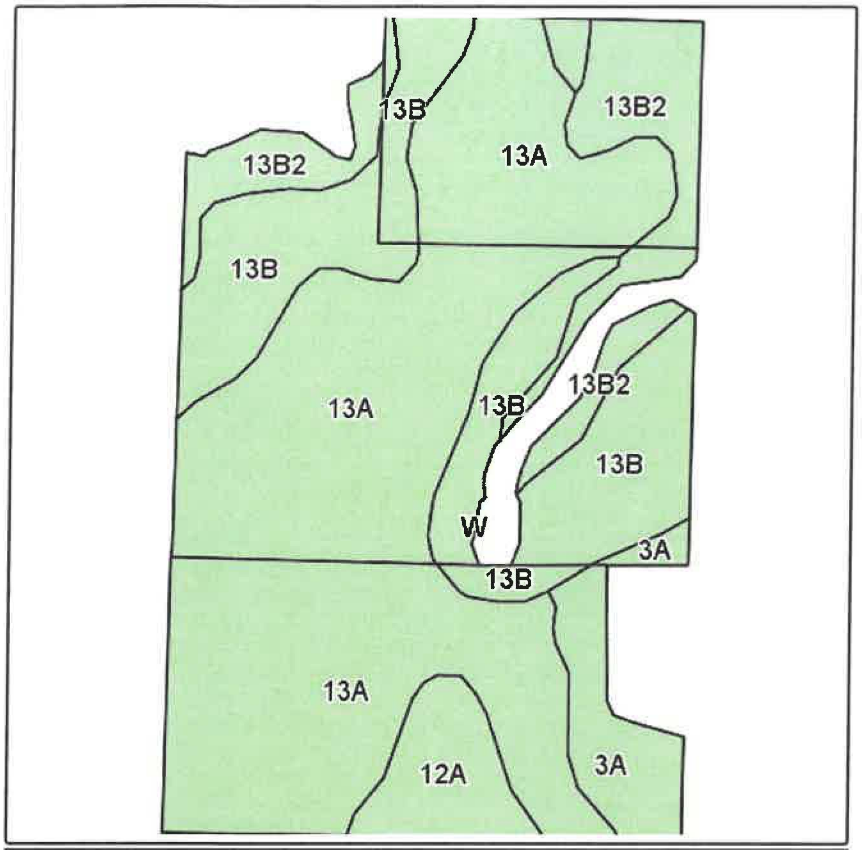
CUSTOMIZED ONLINE MAPPING

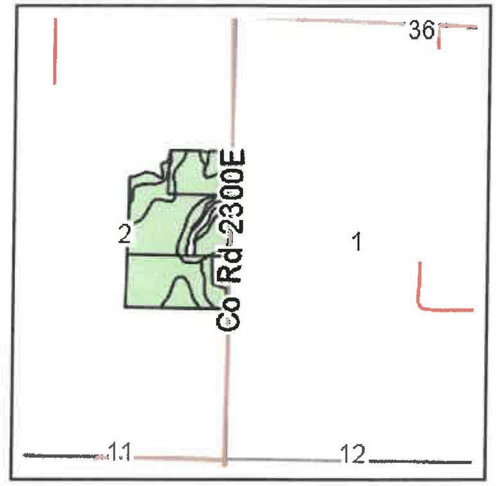
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	84.10	43.7%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B	Bluford silt loam, 2 to 5 percent slopes	45.48	23.7%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	19.06	9.9%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	9.78	5.1%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
14B	Ava silt loam, 2 to 5 percent slopes	9.18	4.8%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
12A	Wynoose silt loam, 0 to 2 percent slopes	7.79	4.1%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
109A	Racoon silt loam, 0 to 2 percent slopes	6.89	3.6%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	130		3.5	5.2	41	51
8382A	Belknap silt loam, 0 to 2 percent slopes, occasionally flooded	6.49	3.4%	0.7ft.	> 6.5ft.	Somewhat poorly drained	IIw	141		4.4	6.5	47	57
15B2	Parke silt loam, 2 to 5 percent slopes, eroded	2.54	1.3%	> 6.5ft.	> 6.5ft.	Well drained	IIe	131	99	3.1	4.6	41	50
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	0.53	0.3%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	

652C2	Passport silt loam, 5 to 10 percent slopes, eroded	0.42	0.2%	1.5ft.	> 6.5ft.	Somewhat poorly drained	IIIe	105		3.5	5.1	35	47
							Weighted Average	**121.2**	**85.6**	**3.1**	**4.6**	**39.6**	**49.4**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



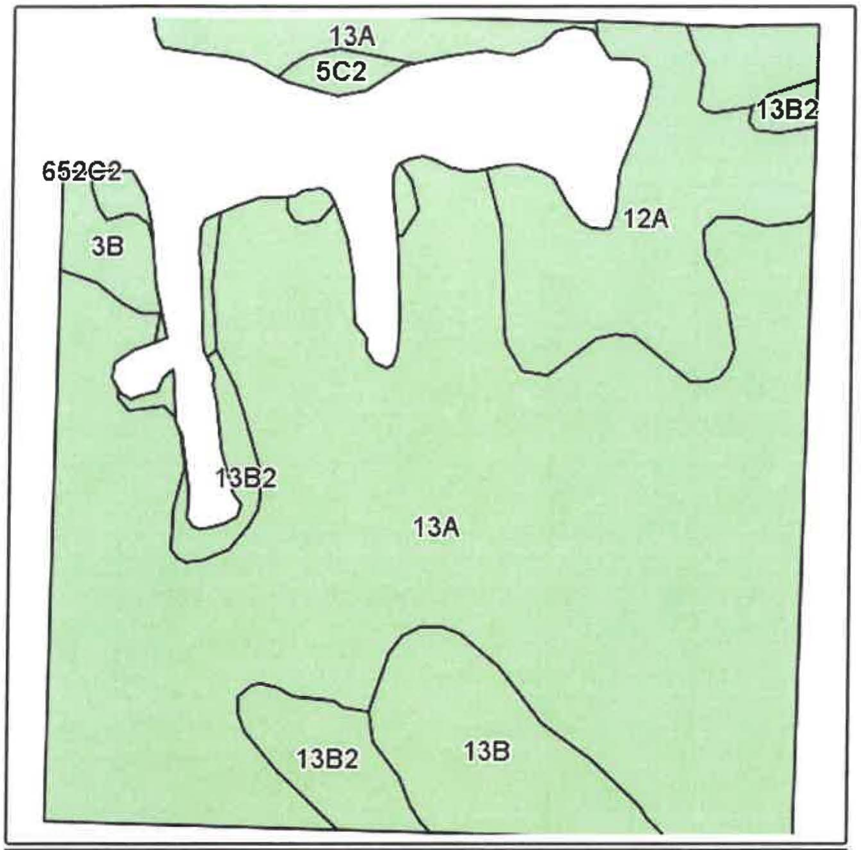
State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **53.65**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

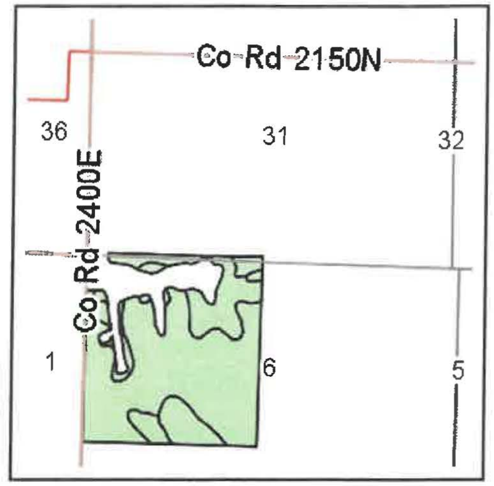
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	29.72	55.4%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B	Bluford silt loam, 2 to 5 percent slopes	12.19	22.7%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	6.22	11.6%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
3A	Hoyleton silt loam, 0 to 2 percent slopes	2.93	5.5%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
12A	Wynoose silt loam, 0 to 2 percent slopes	2.59	4.8%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
						Weighted Average		**121.1**	**98.3**	**3.1**	**4.6**	**39.6**	**49.5**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



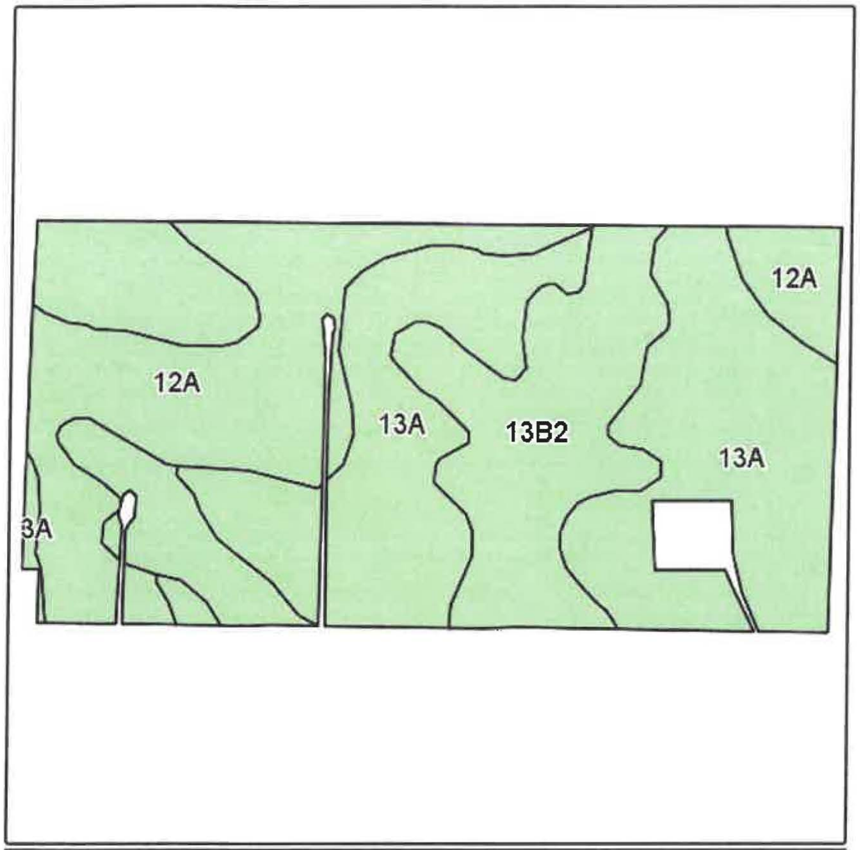
State: **Illinois**
County: **Wayne**
Location: **31-2N-9E**
Township: **Mount Erie**
Acres: **107.01**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

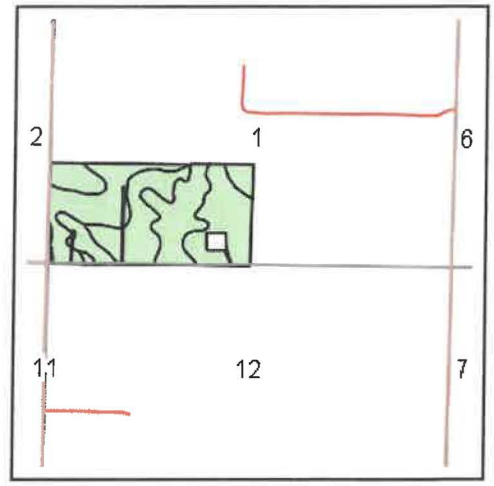
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	77.92	72.8%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
12A	Wynoose silt loam, 0 to 2 percent slopes	12.42	11.6%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
13B	Bluford silt loam, 2 to 5 percent slopes	7.33	6.8%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	5.39	5.0%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	2.15	2.0%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
3B	Hoyleton silt loam, 2 to 5 percent slopes	1.80	1.7%	2ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIe	131	102	4.1	6.1	42	51
							Weighted Average	**120.8**	**96.5**	**3.1**	**4.7**	**39.6**	**49.3**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



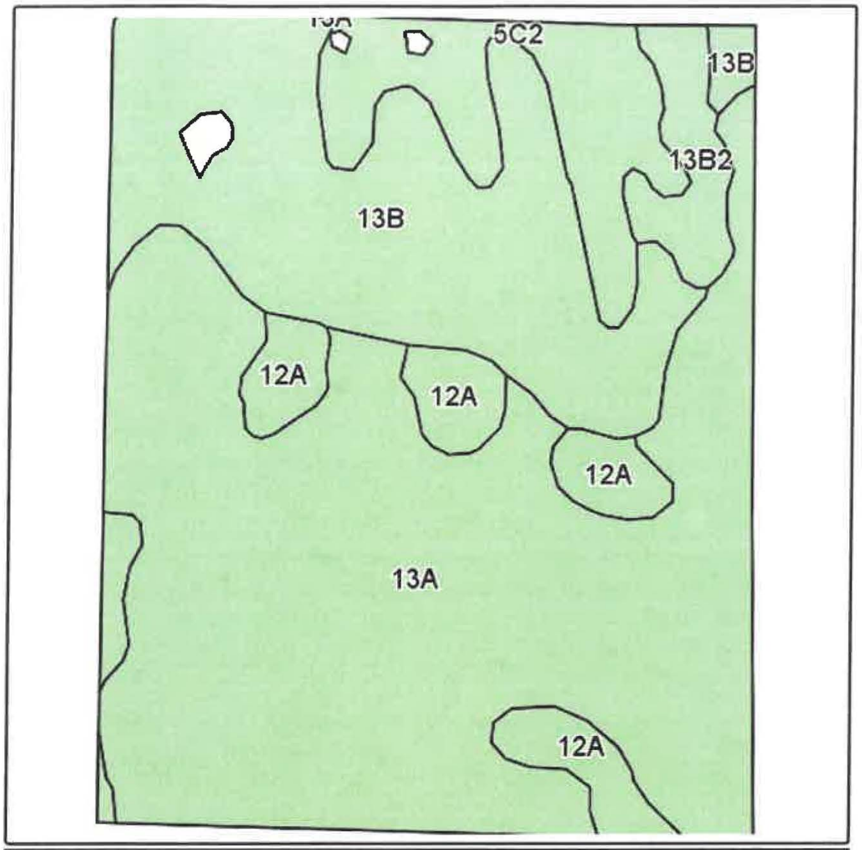
State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **77.34**
Date: **10/11/2013**

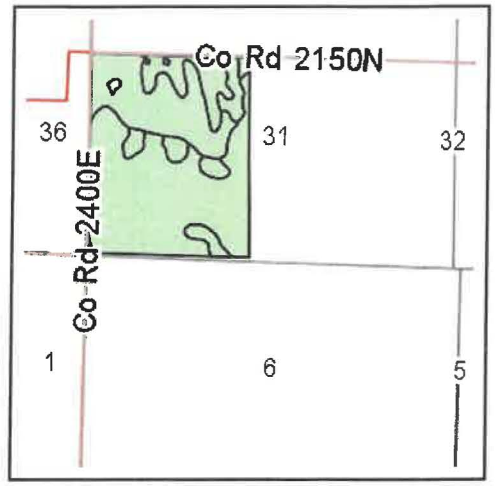
MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by: surety

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	38.51	49.8%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
12A	Wynoose silt loam, 0 to 2 percent slopes	20.42	26.4%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	18.41	23.8%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
							Weighted Average	**118.7**	**97.3**	**3.2**	**4.8**	**39**	**48.5**

Soils Map





State: **Illinois**
County: **Wayne**
Location: **31-2N-9E**
Township: **Mount Erie**
Acres: **122.34**
Date: **10/11/2013**

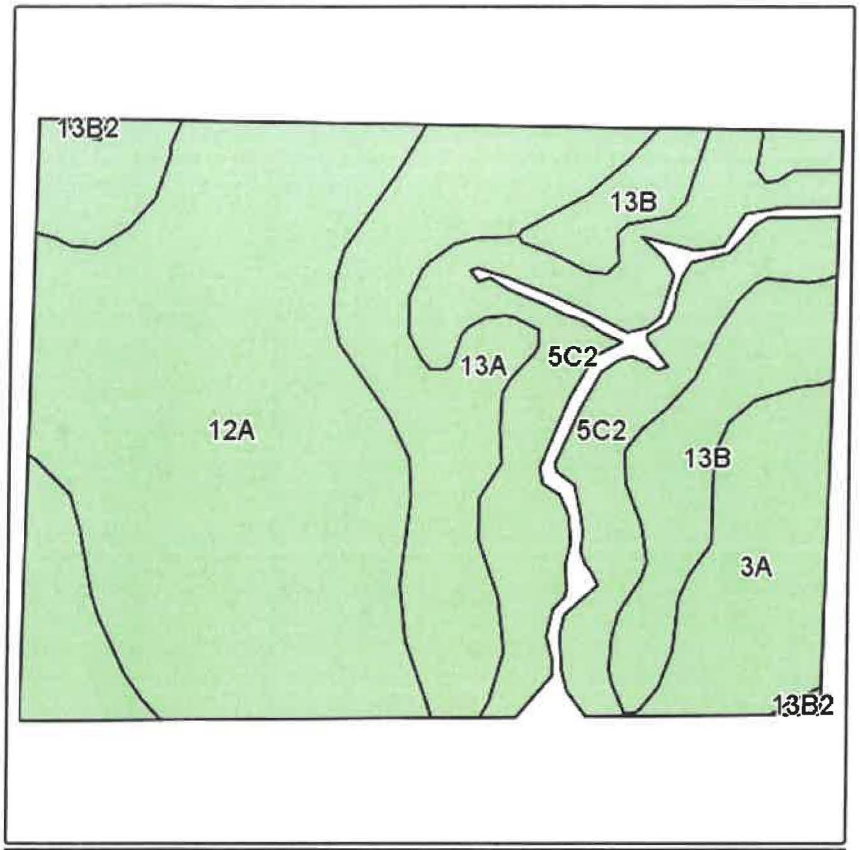
MAURER-STUTZ
ENGINEERS SURVEYORS

Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

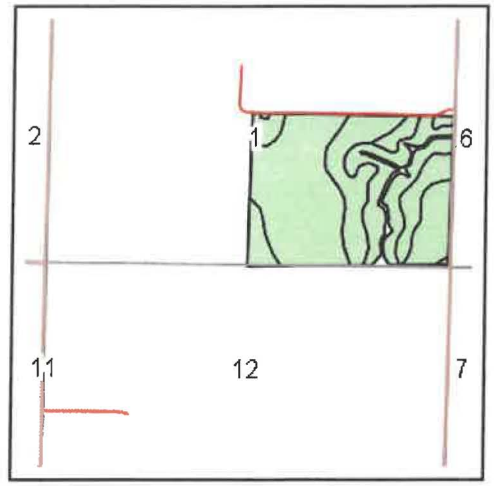
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	67.31	55.0%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B	Bluford silt loam, 2 to 5 percent slopes	32.41	26.5%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	10.45	8.5%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
12A	Wynoose silt loam, 0 to 2 percent slopes	8.25	6.7%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	3.92	3.2%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
						Weighted Average		**120.2**	**90**	**3.1**	**4.6**	**39.3**	**49.1**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **115.26**
Date: **10/11/2013**

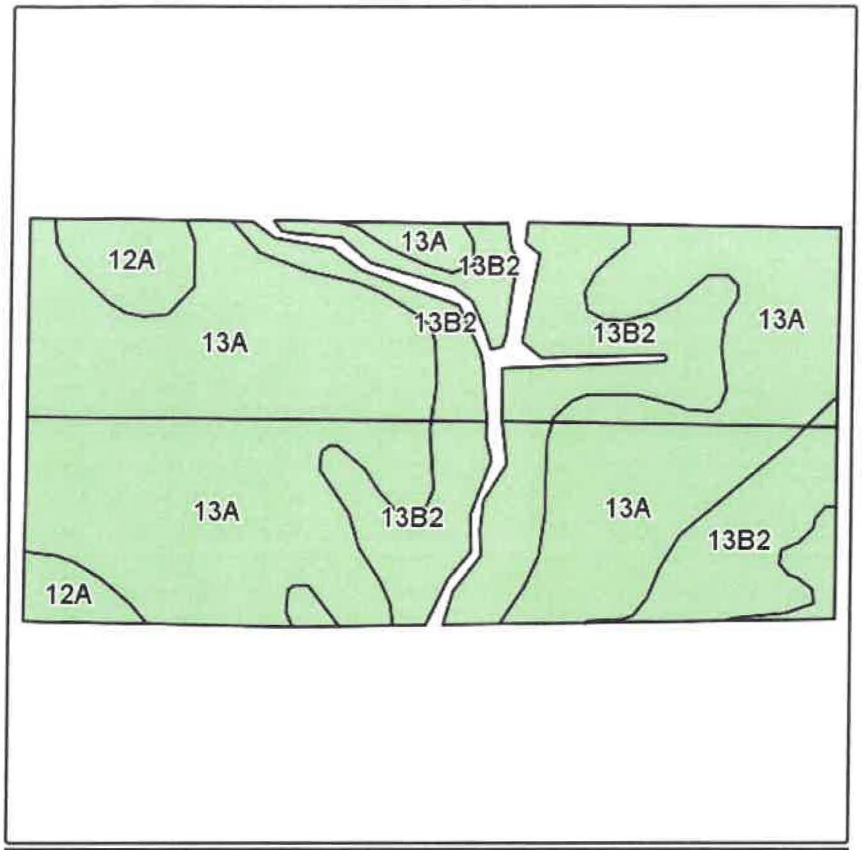
MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by:

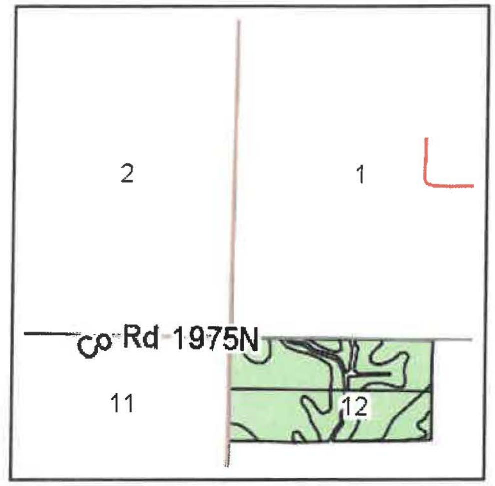
surety

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
12A	Wynoose silt loam, 0 to 2 percent slopes	45.00	39.0%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
13A	Bluford silt loam, 0 to 2 percent slopes	25.36	22.0%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	22.01	19.1%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
13B	Bluford silt loam, 2 to 5 percent slopes	12.25	10.6%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
3A	Hoyleton silt loam, 0 to 2 percent slopes	10.31	8.9%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	0.33	0.3%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
							Weighted Average	**118.6**	**79.6**	**3.6**	**5.3**	**38.7**	**47.9**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



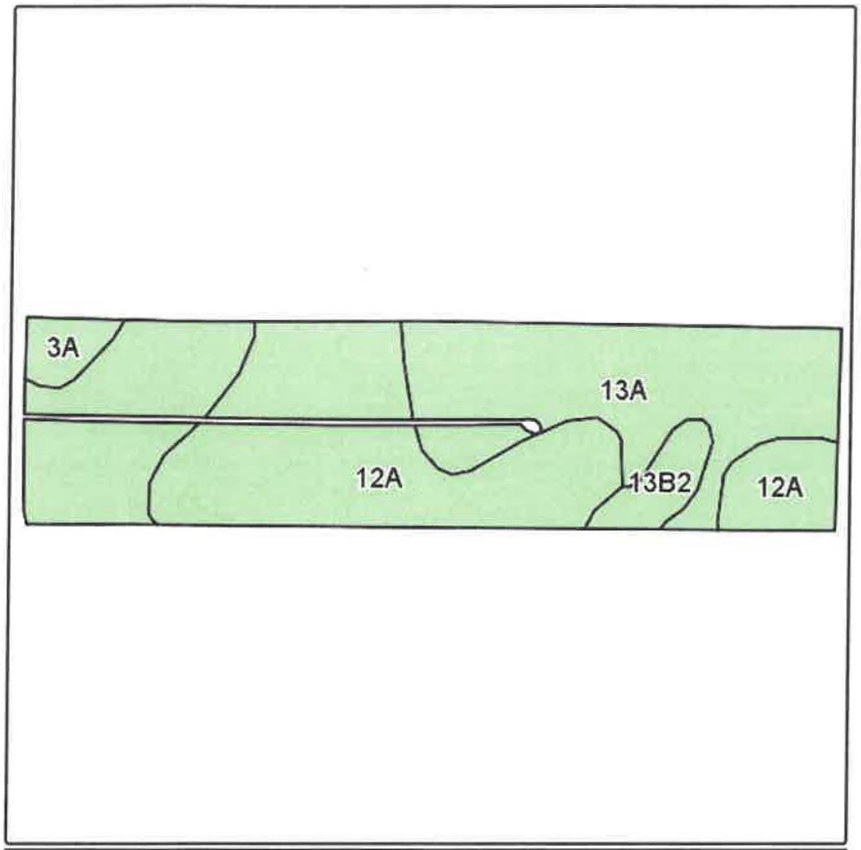
State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **76.36**
Date: **10/10/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

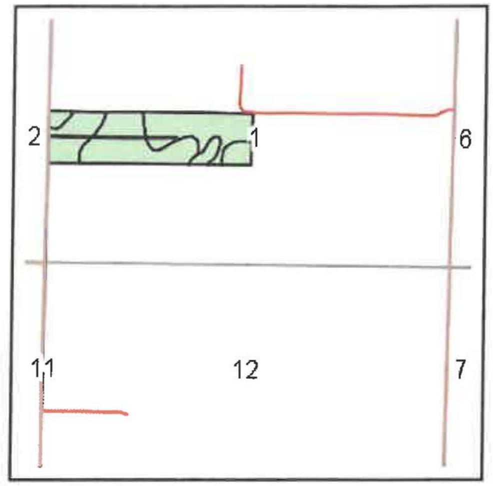
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	49.24	64.5%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	23.12	30.3%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
12A	Wynoose silt loam, 0 to 2 percent slopes	4.00	5.2%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
						Weighted Average		**119.8**	**97.4**	**3**	**4.5**	**39.3**	**49.2**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



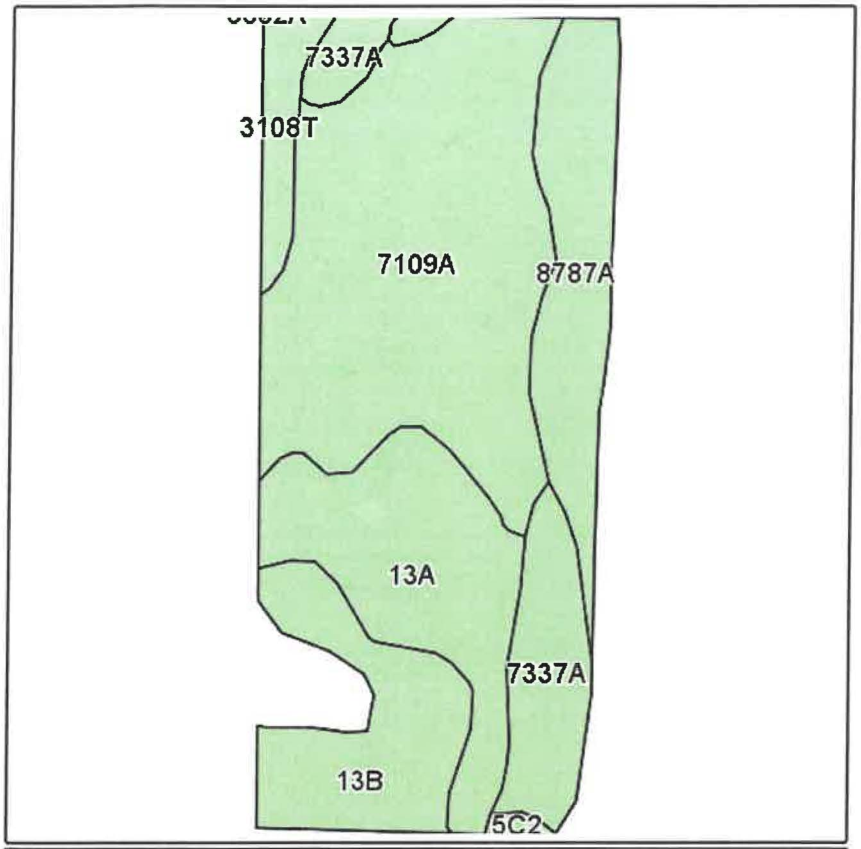
State: **Illinois**
County: **Wayne**
Location: **1-1N-8E**
Township: **Elm River**
Acres: **39.54**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

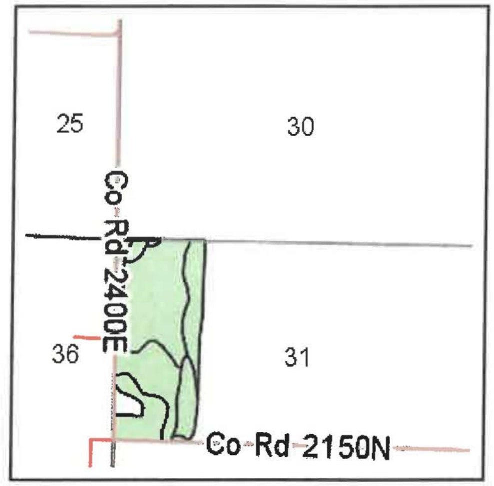
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	20.14	50.9%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
12A	Wynoose silt loam, 0 to 2 percent slopes	16.61	42.0%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	1.61	4.1%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
3A	Hoyleton silt loam, 0 to 2 percent slopes	1.18	3.0%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
							Weighted Average	**119.1**	**98.1**	**3.4**	**5**	**39.1**	**48.3**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



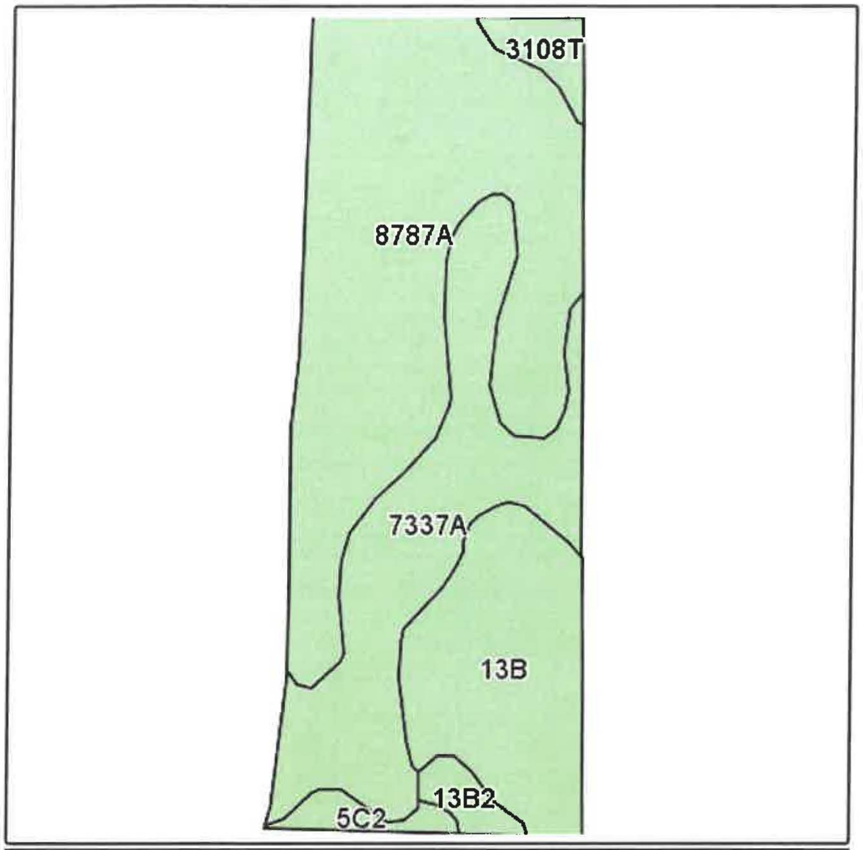
State: **Illinois**
County: **Wayne**
Location: **31-2N-9E**
Township: **Mount Erie**
Acres: **63.57**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

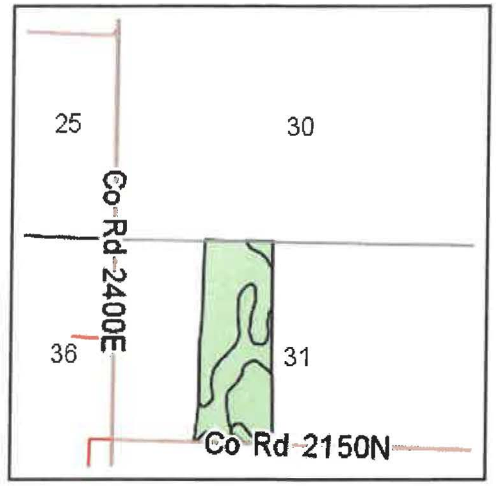
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
7109A	Racoon silt loam, 0 to 2 percent slopes, rarely flooded	26.01	40.9%	0.5ft.	> 6.5ft.	Poorly drained	IIw	130		3.5	5.2	41	51
13A	Bluford silt loam, 0 to 2 percent slopes	11.47	18.0%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
8787A	Banlic silt loam, 0 to 2 percent slopes, occasionally flooded	8.34	13.1%	1.1ft.	2.5ft. (Fragipan)	Somewhat poorly drained	IIIs	128		4.2	6.2	42	51
13B	Bluford silt loam, 2 to 5 percent slopes	8.31	13.1%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
7337A	Creal silt loam, 0 to 2 percent slopes, rarely flooded	6.49	10.2%	2ft.	> 6.5ft.	Somewhat poorly drained	IIw	136	106	3.6	5.3	43	53
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	2.66	4.2%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	0.29	0.5%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
						Weighted Average		**127.2**	**41.5**	**3.5**	**5.1**	**40.8**	**48.6**

Soils Map



Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **31-2N-9E**
Township: **Mount Erie**
Acres: **56.34**
Date: **10/11/2013**

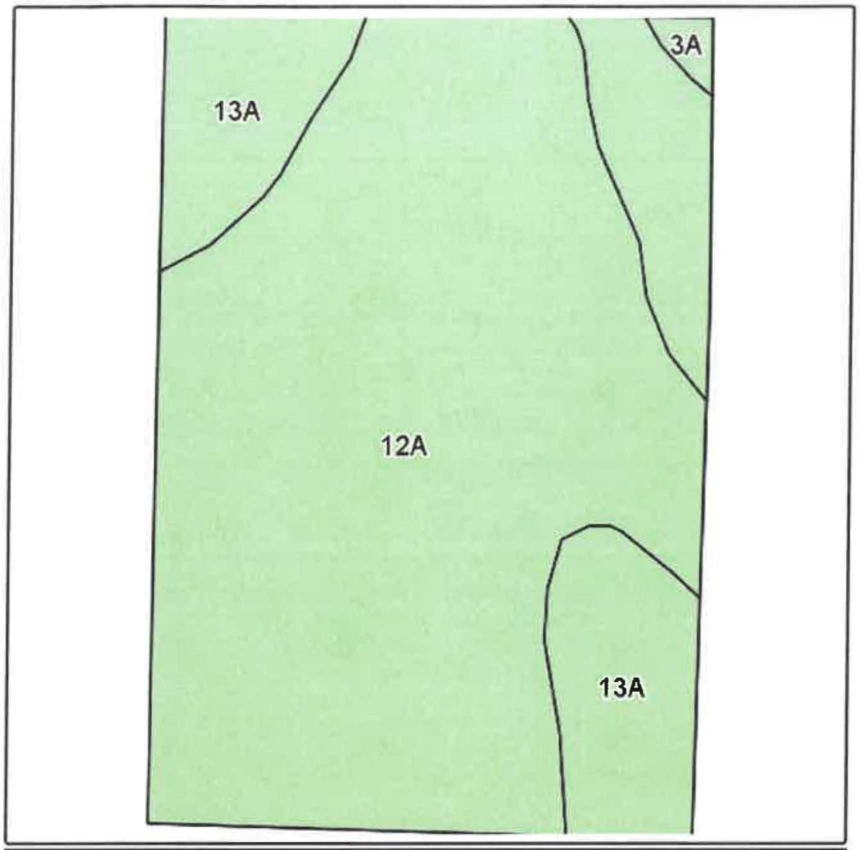
MAURER-STUTZ
ENGINEERS SURVEYORS

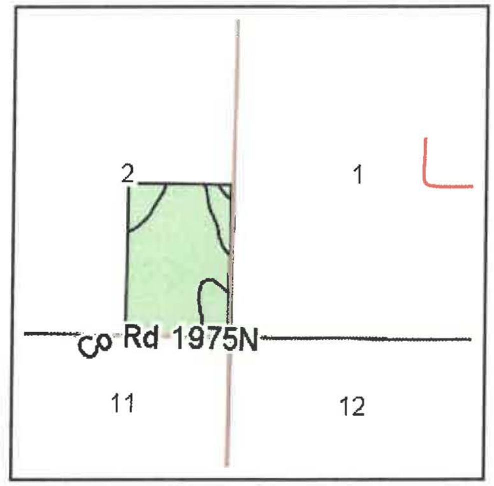
Maps provided by:

surety
CUSTOMIZED ONLINE MAPPING

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
8787A	Banlic silt loam, 0 to 2 percent slopes, occasionally flooded	27.33	48.5%	1.1ft.	2.5ft. (Fragipan)	Somewhat poorly drained	IIIs	128		4.2	6.2	42	51
7337A	Creal silt loam, 0 to 2 percent slopes, rarely flooded	14.69	26.1%	2ft.	> 6.5ft.	Somewhat poorly drained	IIw	136	106	3.6	5.3	43	53
13B	Bluford silt loam, 2 to 5 percent slopes	10.81	19.2%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	120	98	3	4.4	39	49
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	1.35	2.4%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	1.09	1.9%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	1.07	1.9%	1ft.	> 6.5ft.	Somewhat poorly drained	IIIe	115		3.7	5.4	37	47
						Weighted Average		**127.9**	**48.3**	**3.8**	**5.6**	**41.5**	**49.8**

Soils Map





State:	**Illinois**
County:	**Wayne**
Location:	**1-1N-8E**
Township:	**Elm River**
Acres:	**59.78**
Date:	**10/10/2013**

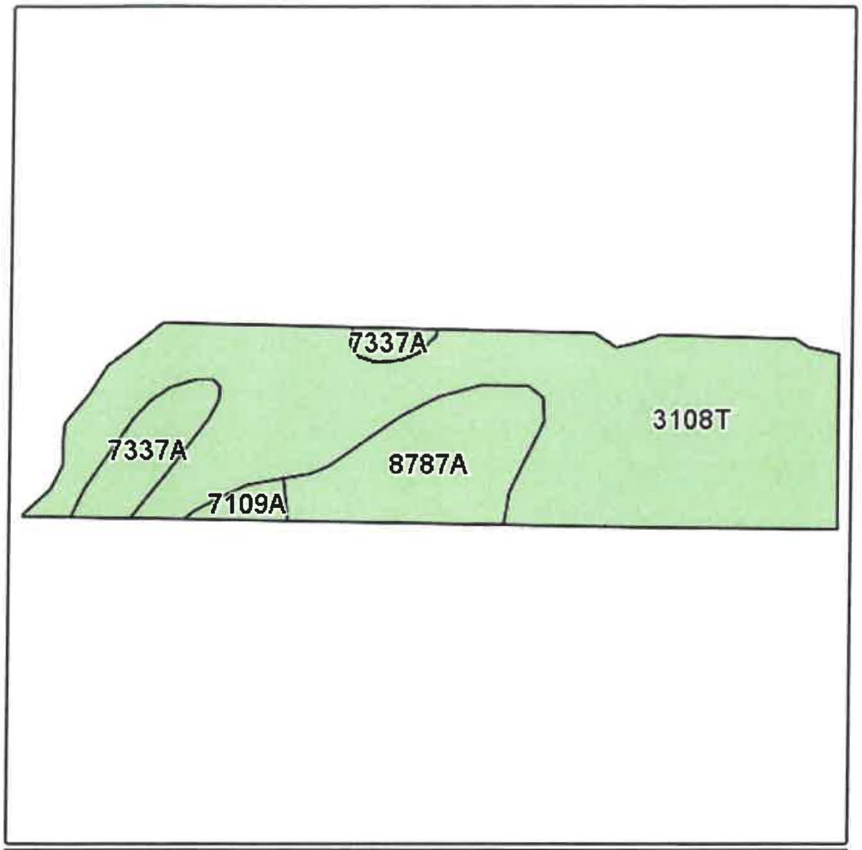
MAURER-STUTZ
ENGINEERS SURVEYORS

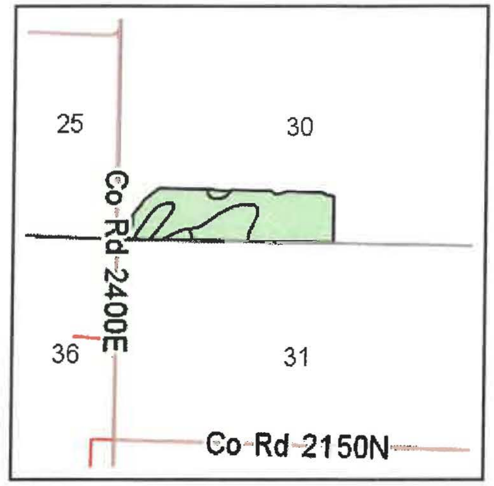
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
12A	Wynoose silt loam, 0 to 2 percent slopes	45.48	76.1%	0.5ft.	1.7ft. (Abrupt textural change)	Poorly drained	IIIw	115	97	3.8	5.7	38	46
13A	Bluford silt loam, 0 to 2 percent slopes	13.90	23.3%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
3A	Hoyleton silt loam, 0 to 2 percent slopes	0.40	0.7%	1.7ft.	1.2ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
							Weighted Average	**116.7**	**97.5**	**3.6**	**5.4**	**38.5**	**47**

Soils Map





State: **Illinois**
County: **Wayne**
Location: **31-2N-9E**
Township: **Mount Erie**
Acres: **38.35**
Date: **10/11/2013**

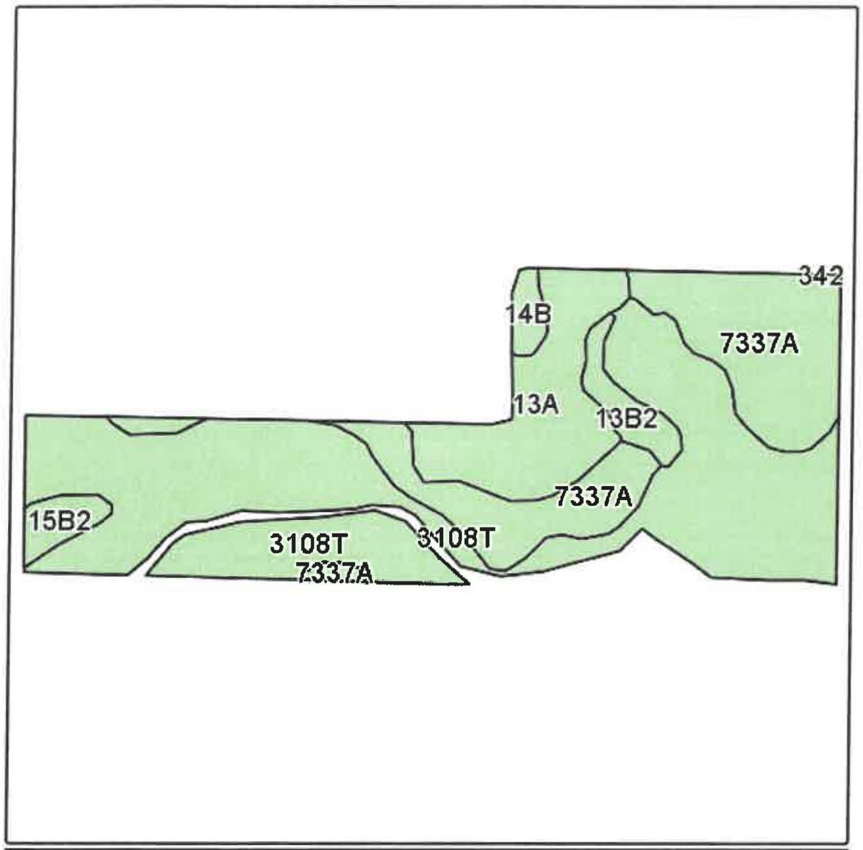
MAURER-STUTZ
ENGINEERS SURVEYORS

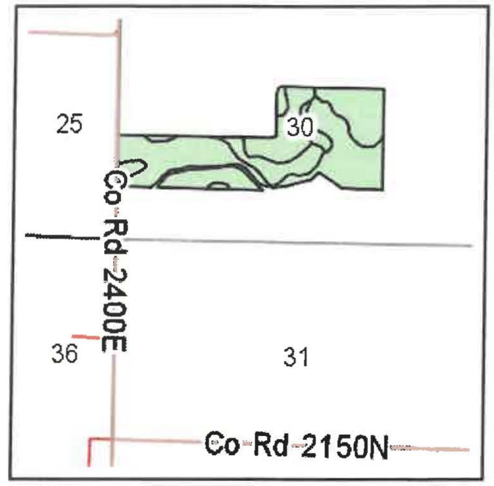
Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING

Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	28.24	73.6%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
8787A	Banlic silt loam, 0 to 2 percent slopes, occasionally flooded	6.37	16.6%	1.1ft.	2.5ft. (Fragipan)	Somewhat poorly drained	IIIs	128		4.2	6.2	42	51
7337A	Creal silt loam, 0 to 2 percent slopes, rarely flooded	3.03	7.9%	2ft.	> 6.5ft.	Somewhat poorly drained	IIw	136	106	3.6	5.3	43	53
7109A	Racoon silt loam, 0 to 2 percent slopes, rarely flooded	0.71	1.9%	0.5ft.	> 6.5ft.	Poorly drained	IIw	130		3.5	5.2	41	51
						Weighted Average		**123.5**	**8.4**	**3.8**	**5.7**	**40.6**	**13.6**

Soils Map





State: **Illinois**
County: **Wayne**
Location: **31-2N-9E**
Township: **Mount Erie**
Acres: **70.29**
Date: **10/11/2013**

MAURER-STUTZ
ENGINEERS SURVEYORS

Maps provided by:
surety
CUSTOMIZED ONLINE MAPPING
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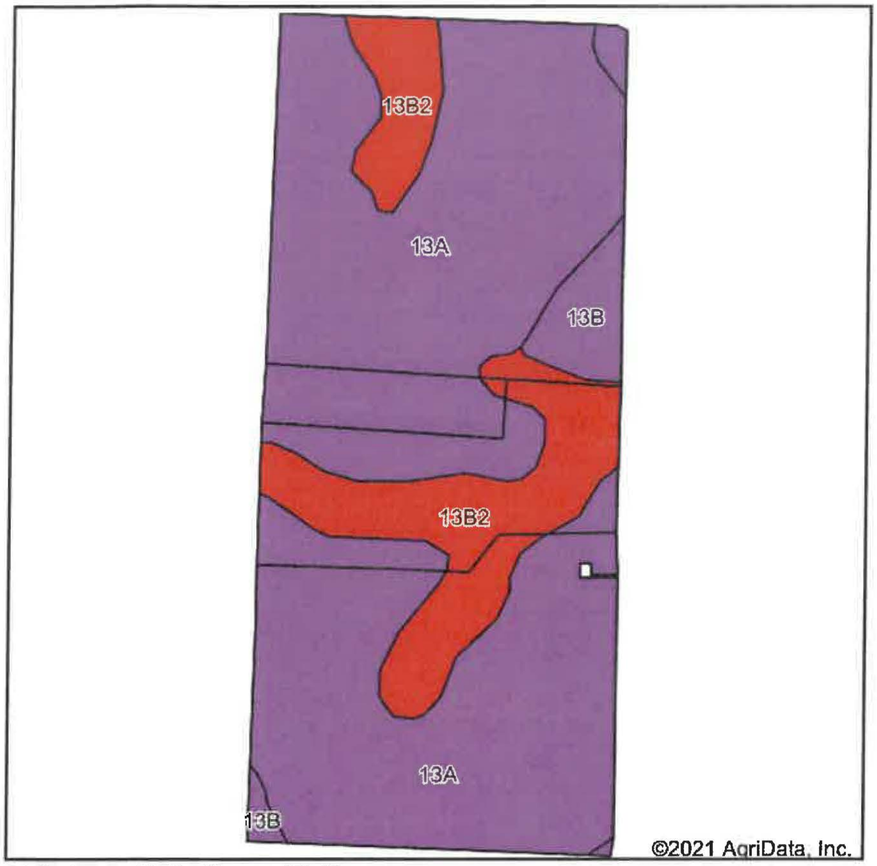
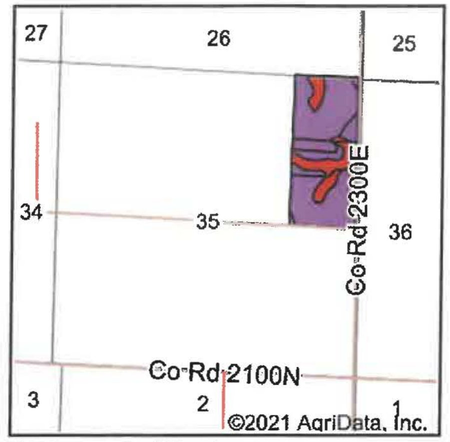
Field borders provided by Farm Service Agency as of 5/21/2008.
Soils data provided by USDA and NRCS.

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	38.10	54.2%	0.5ft.	> 6.5ft.	Poorly drained	IIIw	121		3.8	5.6	40	
7337A	Creal silt loam, 0 to 2 percent slopes, rarely flooded	17.67	25.1%	2ft.	> 6.5ft.	Somewhat poorly drained	IIw	136	106	3.6	5.3	43	53
13A	Bluford silt loam, 0 to 2 percent slopes	9.90	14.1%	1.2ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIw	122	99	3	4.5	40	50
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	2.05	2.9%	1.6ft.	1.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	116	94	2.9	4.3	38	48
15B2	Parke silt loam, 2 to 5 percent slopes, eroded	1.54	2.2%	> 6.5ft.	> 6.5ft.	Well drained	IIe	131	99	3.1	4.6	41	50
14B	Ava silt loam, 2 to 5 percent slopes	1.03	1.5%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe	120	95	2.9	4.2	39	50
							Weighted Average	**125**	**46.9**	**3.6**	**5.3**	**40.7**	**23.6**

H38 Soils Map



Soils data provided by USDA and NRCS.



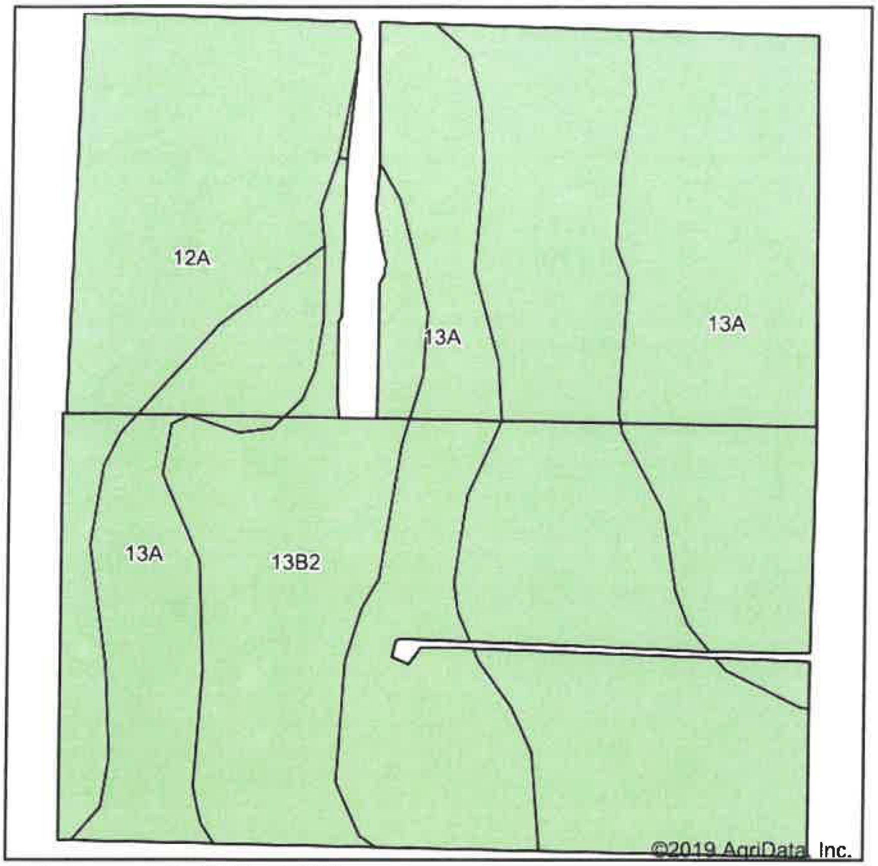
State: **Illinois**
County: **Wayne**
Location: **35-2N-8E**
Township: **Zif**
Acres: **68.92**
Date: **4/16/2021**

MAURER-STUTZ ENGINEERS SURVEYORS

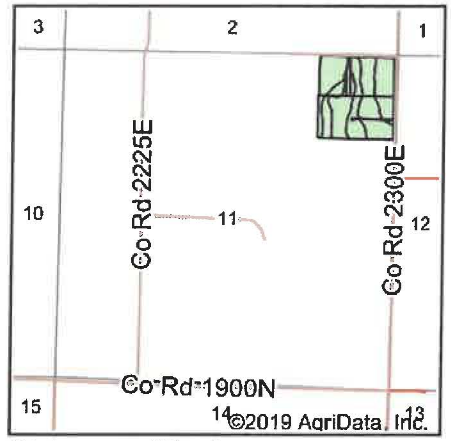
Maps Provided By: surety CUSTOMIZED ONLINE MAPPING

Area Symbol: IL191, Soil Area Version: 18										
Code	Soil Description	Acres	Percent of field	Il. State Productivity Index Legend	Water Table	Restrictive Layer	Soil Drainage	Corn Bu/A	Soybeans Bu/A	Crop productivity index for optimum management
13A	Bluford silt loam, 0 to 2 percent slopes	52.86	76.7%		1.2ft.	1.6ft. (Abrupt textural change)	Somewhat poorly drained	136	44	101
**13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	12.96	18.8%		1.6ft.	0.7ft. (Abrupt textural change)	Somewhat poorly drained	**129	**42	**96
**13B	Bluford silt loam, 2 to 5 percent slopes	3.10	4.5%		1.2ft.	1.6ft. (Abrupt textural change)	Somewhat poorly drained	**135	**44	**100
							Weighted Average	**134.6**	**43.6**	**100**

Table: Optimum Crop Productivity Ratings for Illinois Soil by K.R. Olson and J.M. Lang, Office of Research, ACES, University of Illinois at Champaign-Urbana. Version: 1/2/2012 Amended Table S2 B811
Crop yields and productivity indices for optimum management (B811) are maintained at the following NRES web site: http://soilproductivity.nres.illinois.edu/
** Indexes adjusted for slope and erosion according to Bulletin 811 Table S3
*c: Using Capabilities Class Dominant Condition Aggregation Method
Soils data provided by USDA and NRCS. Soils data provided by University of Illinois at Champaign-Urbana.



Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **11-1N-8E**
Township: **Elm River**
Acres: **34.04**
Date: **3/12/2020**

MAURER-STUTZ
ENGINEERS SURVEYORS

Maps Provided By:
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CUSTOMIZED ONLINE MAPPING
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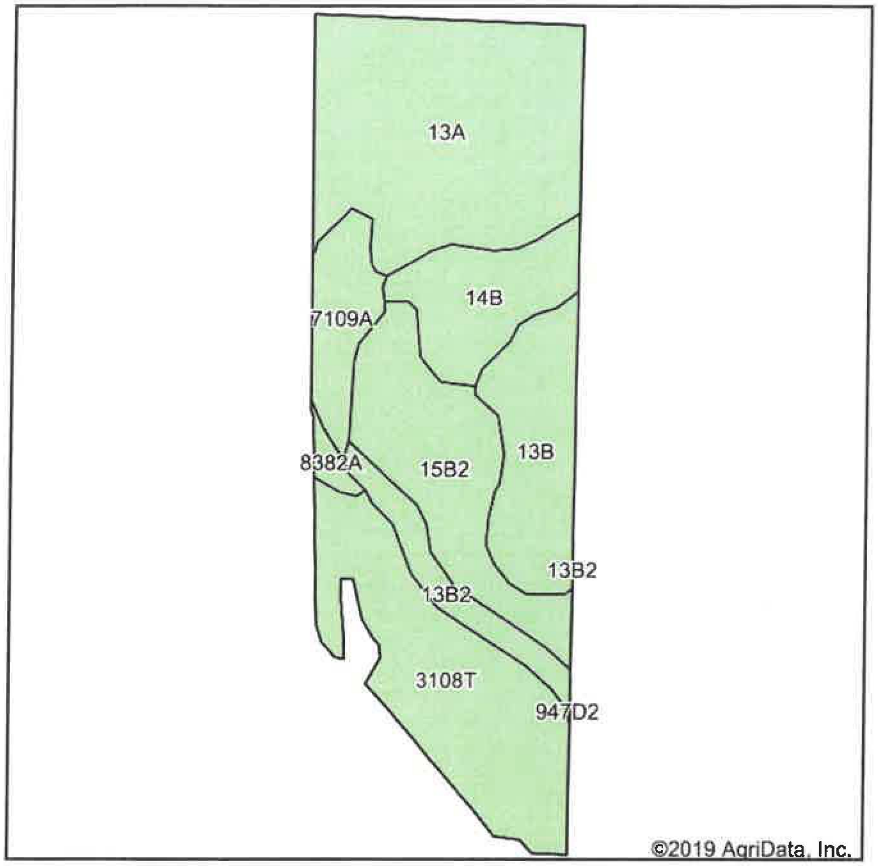
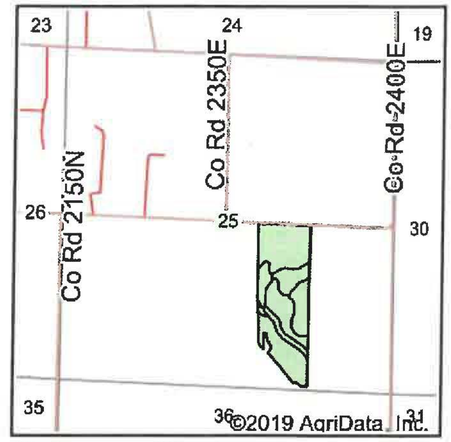
Area Symbol: IL191, Soil Area Version: 17

Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class *c
12A	Wynoose silt loam, 0 to 2 percent slopes	14.66	43.1%	0.5ft.	1.6ft. (Abrupt textural change)	Poorly drained	IIIw
13A	Bluford silt loam, 0 to 2 percent slopes	14.39	42.3%	1.2ft.	1.6ft. (Abrupt textural change)	Somewhat poorly drained	IIw
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	4.99	14.7%	1.6ft.	0.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe

*c: Using Capabilities Class Dominant Condition Aggregation Method
Soils data provided by USDA and NRCS.



Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **25-2N-8E**
Township: **Zif**
Acres: **42.34**
Date: **3/12/2020**

MAURER-STUTZ
ENGINEERS SURVEYORS

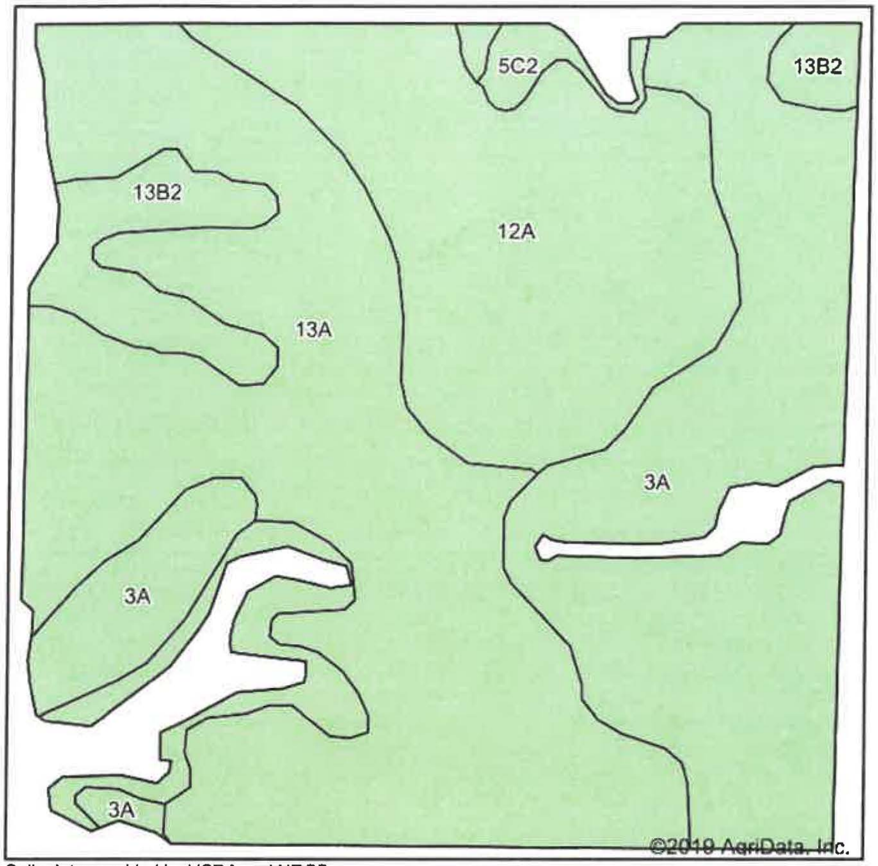
Maps Provided By:
surety
CUSTOMIZED ONLINE MAPPING

Area Symbol: IL191, Soil Area Version: 17

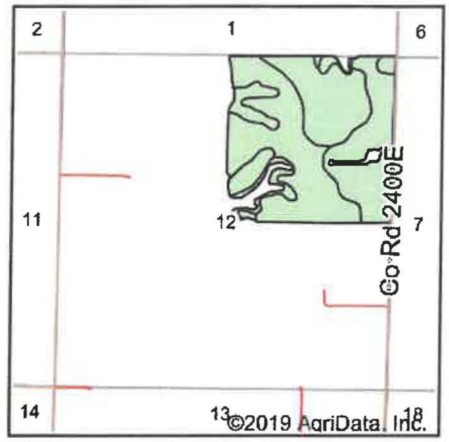
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class *c
13A	Bluford silt loam, 0 to 2 percent slopes	13.13	31.0%	1.2ft.	1.6ft. (Abrupt textural change)	Somewhat poorly drained	IIw
3108T	Bonnie silt loam, sodic, 0 to 2 percent slopes, frequently flooded	9.12	21.5%	0.5ft.	> 6.5ft.	Poorly drained	IIIw
15B2	Parke silt loam, 2 to 5 percent slopes, eroded	6.42	15.2%	> 6.5ft.	> 6.5ft.	Well drained	IIe
13B	Bluford silt loam, 2 to 5 percent slopes	4.86	11.5%	1.2ft.	1.6ft. (Abrupt textural change)	Somewhat poorly drained	IIe
14B	Ava silt loam, 2 to 5 percent slopes	3.89	9.2%	2.2ft.	2.8ft. (Fragipan)	Moderately well drained	IIe
7109A	Racoon silt loam, 0 to 2 percent slopes, rarely flooded	2.51	5.9%	0.5ft.	> 6.5ft.	Poorly drained	IIIw
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	2.00	4.7%	1.6ft.	0.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe
8382A	Belknap silt loam, 0 to 2 percent slopes, occasionally flooded	0.41	1.0%	2ft.	> 6.5ft.	Somewhat poorly drained	IIw

*c: Using Capabilities Class Dominant Condition Aggregation Method
Soils data provided by USDA and NRCS.

L-39 - Lynch - 39



Soils data provided by USDA and NRCS.



State: **Illinois**
County: **Wayne**
Location: **6-1N-9E**
Township: **Mount Erie**
Acres: **149.77**
Date: **5/7/2019**

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ENGINEERS SURVEYORS

Maps Provided By:
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CUSTOMIZED ONLINE MAPPING

Area Symbol: IL191, Soil Area Version: 16

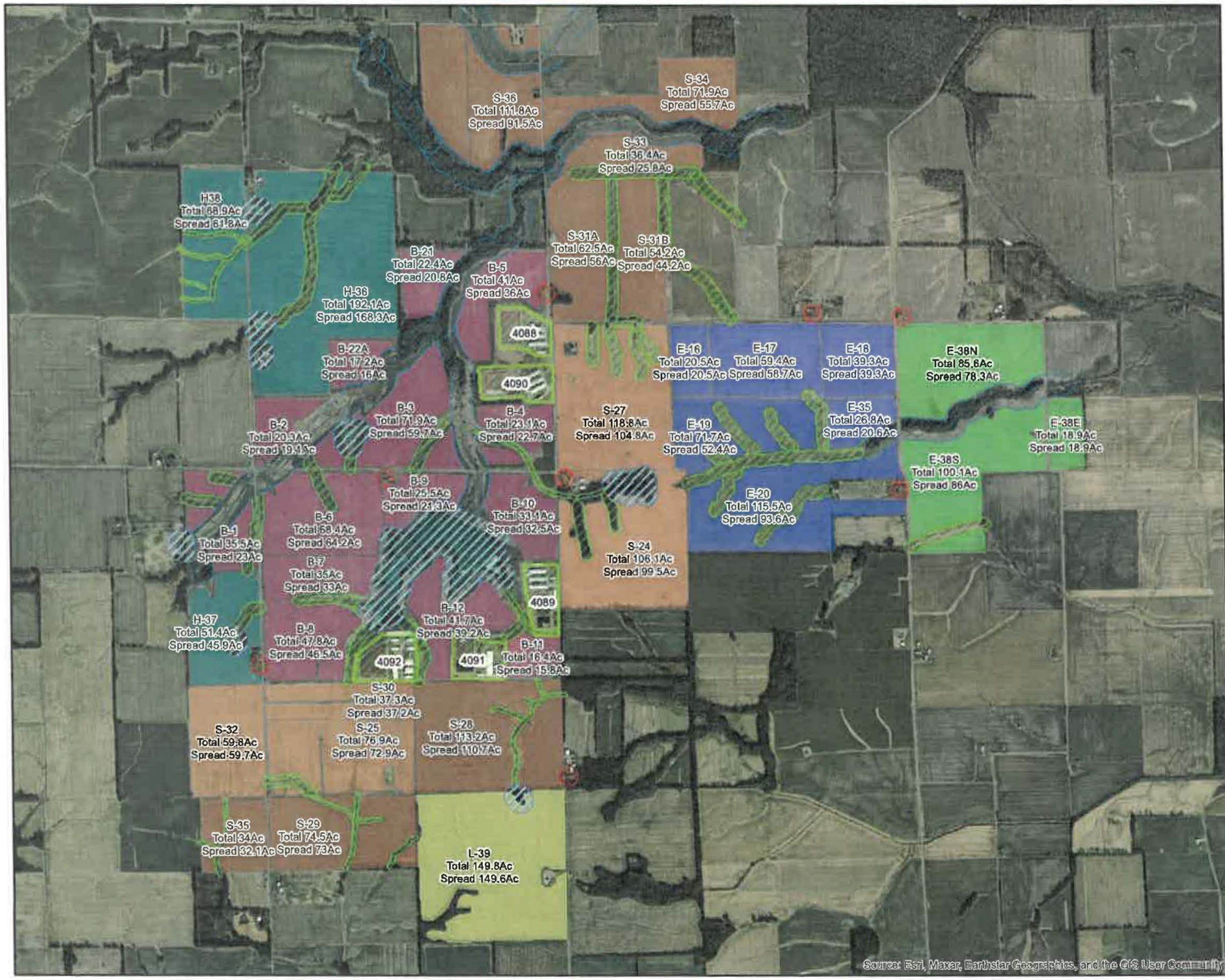
Code	Soil Description	Acres	Percent of field	Water Table	Restrictive Layer	Soil Drainage	Non-Irr Class *c	Corn	Grain sorghum	Grass legume hay	Grass legume pasture	Soybeans	Winter wheat
13A	Bluford silt loam, 0 to 2 percent slopes	59.71	39.9%	1.2ft.	1.6ft. (Abrupt textural change)	Somewhat poorly drained	IIw	119	98	3.1	5.1	39	49
3A	Hoyleton silt loam, 0 to 2 percent slopes	42.95	28.7%	1.7ft.	0.9ft. (Abrupt textural change)	Somewhat poorly drained	IIw	132	103	4.2	6.2	42	52
12A	Wynoose silt loam, 0 to 2 percent slopes	31.69	21.2%	0.5ft.	1.6ft. (Abrupt textural change)	Poorly drained	IIIw	114	95	3.7	6.2	37	46
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	13.77	9.2%	1.6ft.	0.7ft. (Abrupt textural change)	Somewhat poorly drained	IIe	114	93	2.9	4.8	37	47
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	1.65	1.1%	1.7ft.	> 6.5ft.	Somewhat poorly drained	IIIe	107	86	3.4	5.6	35	43
							Weighted Average	**121.1**	**98.2**	**3.5**	**5.6**	**39.2**	**49**

*c: Using Capabilities Class Dominant Condition Aggregation Method

Soils data provided by USDA and NRCS.

A.3. Manure Application Setback Maps

MANURE APPLICATION SETBACK MAP



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MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS
OVERVIEW

NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

Legend

Buffers and Setbacks

- Pond 200 ft
- Potable Water Well 150 ft
- Stream 200 ft
- Subsurface Drain Intake 100 ft
- Surface Water 200 ft
- Veg. Waterway 100 ft or 35 ft Veg Buffer

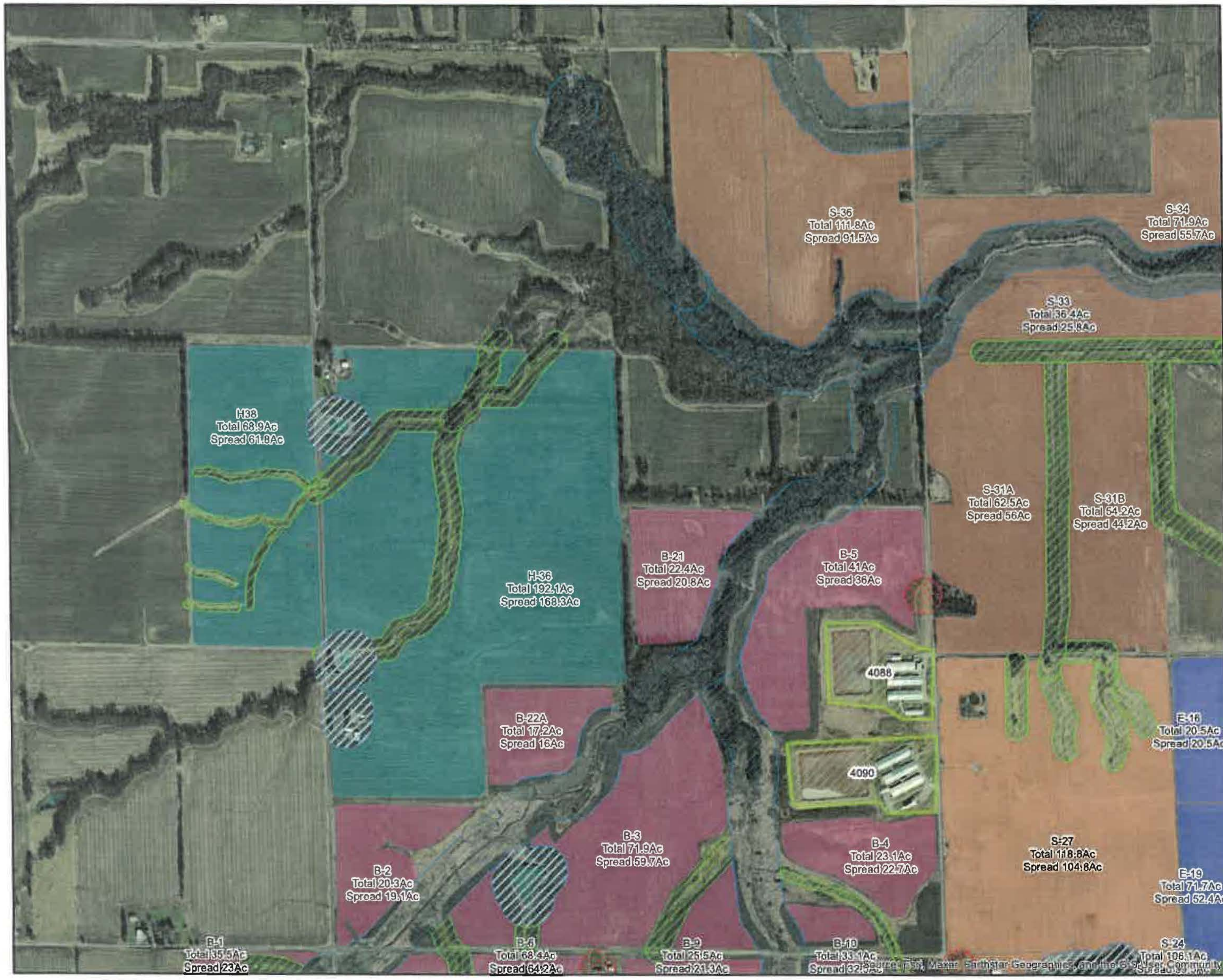
SURETY_CLU_FIELDS

- Hohlbaugh (Atterberry)
- Eckel (Bass)
- Eckel (Iles)
- Holhbaugh (Bailey)
- Lynch
- Shan

N

Feet
0 1,700 3,400

MANURE APPLICATION SETBACK MAP



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MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS
T02N R08E S36

NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

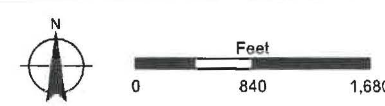
Legend

Buffers and Setbacks

- Pond 200 ft
- Potable Water Well 150 ft
- Stream 200 ft
- Subsurface Drain Intake 100 ft
- Surface Water 200 ft
- Veg. Waterway 100 ft or 35 ft Veg Buffer

SURETY_CLU_FIELDS

- Hohlbaugh (Atterberry)
- Eckel (Bass)
- Eckel (Iles)
- Holhbaugh (Bailey)
- Lynch
- Shan



MANURE APPLICATION SETBACK MAP

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MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS
T01N R08E S01

NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

Legend

Buffers and Setbacks

- Pond 200 ft
- Potable Water Well 150 ft
- Stream 200 ft
- Subsurface Drain Intake 100 ft
- Surface Water 200 ft
- Veg. Waterway 100 ft or 35 ft Veg Buffer

SURETY_CLU_FIELDS

- Hohlbaugh (Atterberry)
- Eckel (Bass)
- Eckel (Iles)
- Holhbaugh (Bailey)
- Lynch
- Shan

N

Feet
0 850 1,700

MANURE APPLICATION SETBACK MAP

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MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS
T02N R09E S30-32

NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

Legend

Buffers and Setbacks

- Pond 200 ft
- Potable Water Well 150 ft
- Stream 200 ft
- Subsurface Drain Intake 100 ft
- Surface Water 200 ft
- Veg. Waterway 100 ft or 35 ft Veg Buffer

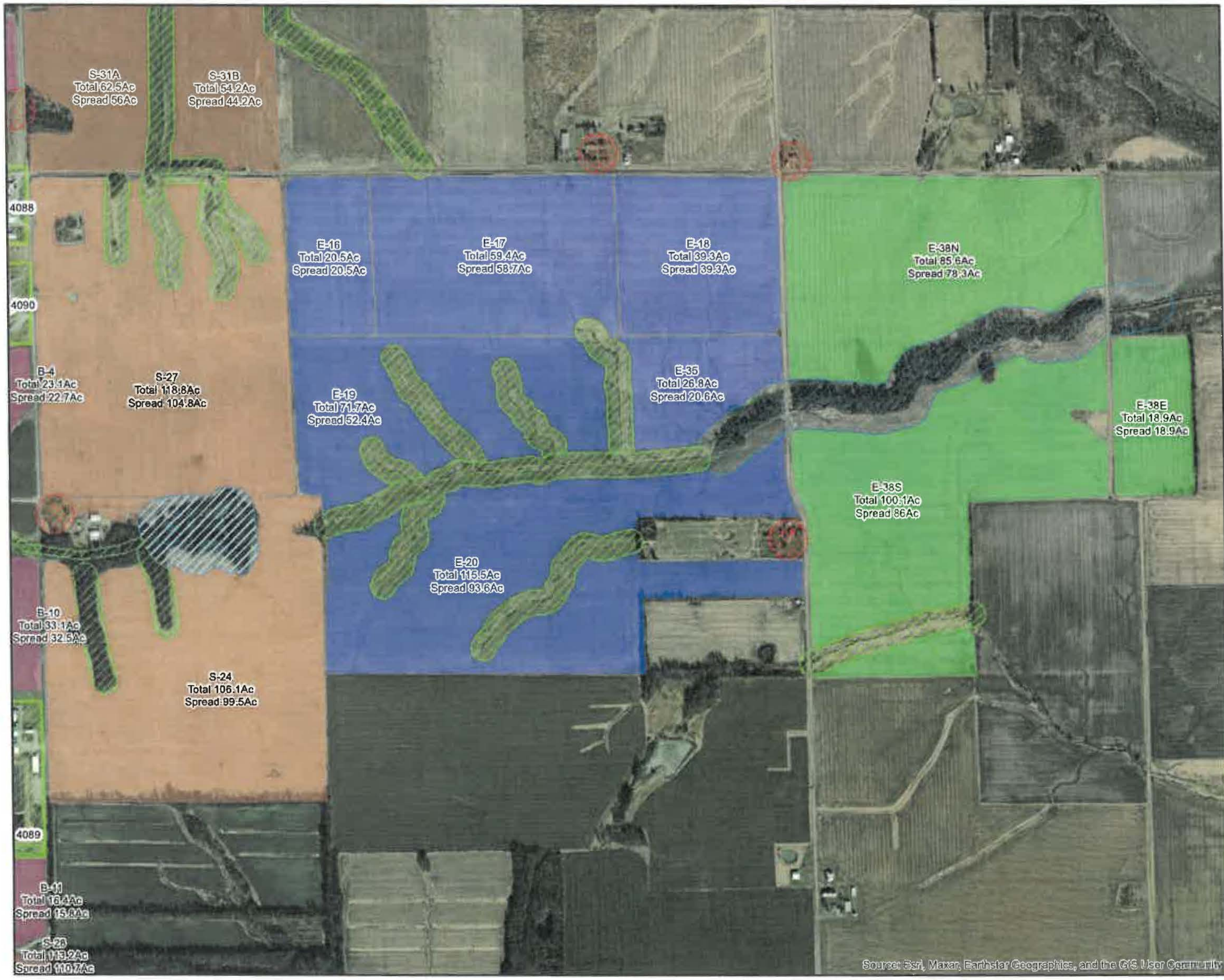
SURETY_CLU_FIELDS

- Hohlbaugh (Atterberry)
- Eckel (Bass)
- Eckel (Iles)
- Holhbaugh (Bailey)
- Lynch
- Shan

N

Feet
0 600 1,200

MANURE APPLICATION SETBACK MAP



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MURPHY BROWN, LLC.
MANURE APPLICATION EXPORT FIELDS
T02N R09E S31-32, T01N R09E S5-6

NOTE:
ESRI SHAPEFILES WERE OBTAINED FOR THE PURPOSES OF COMPLETING APPLICATION SETBACK MAPS. ADJUSTMENTS TO FIELD BOUNDARIES MAY HAVE RESULTED IN SLIGHT DISCREPANCIES IN FIELD ACREAGE.

Legend

Buffers and Setbacks

- Pond 200 ft
- Potable Water Well 150 ft
- Stream 200 ft
- Subsurface Drain Intake 100 ft
- Surface Water 200 ft
- Veg. Waterway 100 ft or 35 ft Veg Buffer

SURETY_CLU_FIELDS

- Hohlbaugh (Atterberry)
- Eckel (Bass)
- Eckel (Iles)
- Holhbaugh (Bailey)
- Lynch
- Shan

N

Feet
0 770 1,540

Appendix B. Soil Analysis\Sampling Procedure

B.1. Soil Sampling Procedure

Soil samples for soil tests should not represent more than 2.5 acres. The fields will be sub-divided into units of approximately 2.5 acres for soil sampling and nutrient planning purposes. Soil sampling depth for P and K shall be 7 inches. Under no till conditions pH can be tested using the top 4 inches only.

Soil samples shall be collected and prepared according to The Illinois Agronomy handbook. Take soil samples prior to manure application (e.g., Mid Autumn). Since manure will typically be applied to soybean stubble anticipating a corn crop in the spring, soil tests should either be taken in corn stalks or soybean stubble prior to manure application. Wait 9 months after manure application before soil testing.

Soil testing shall include analysis for any nutrients for which specific information is needed to develop the nutrient plan. Request analyses pertinent to monitoring or amending the annual nutrient budget, e.g. pH, electrical conductivity (EC), soil organic matter, nitrogen, phosphorus, and potassium.

B.2. Soil Analysis

The minimum analysis for Illinois is to include:

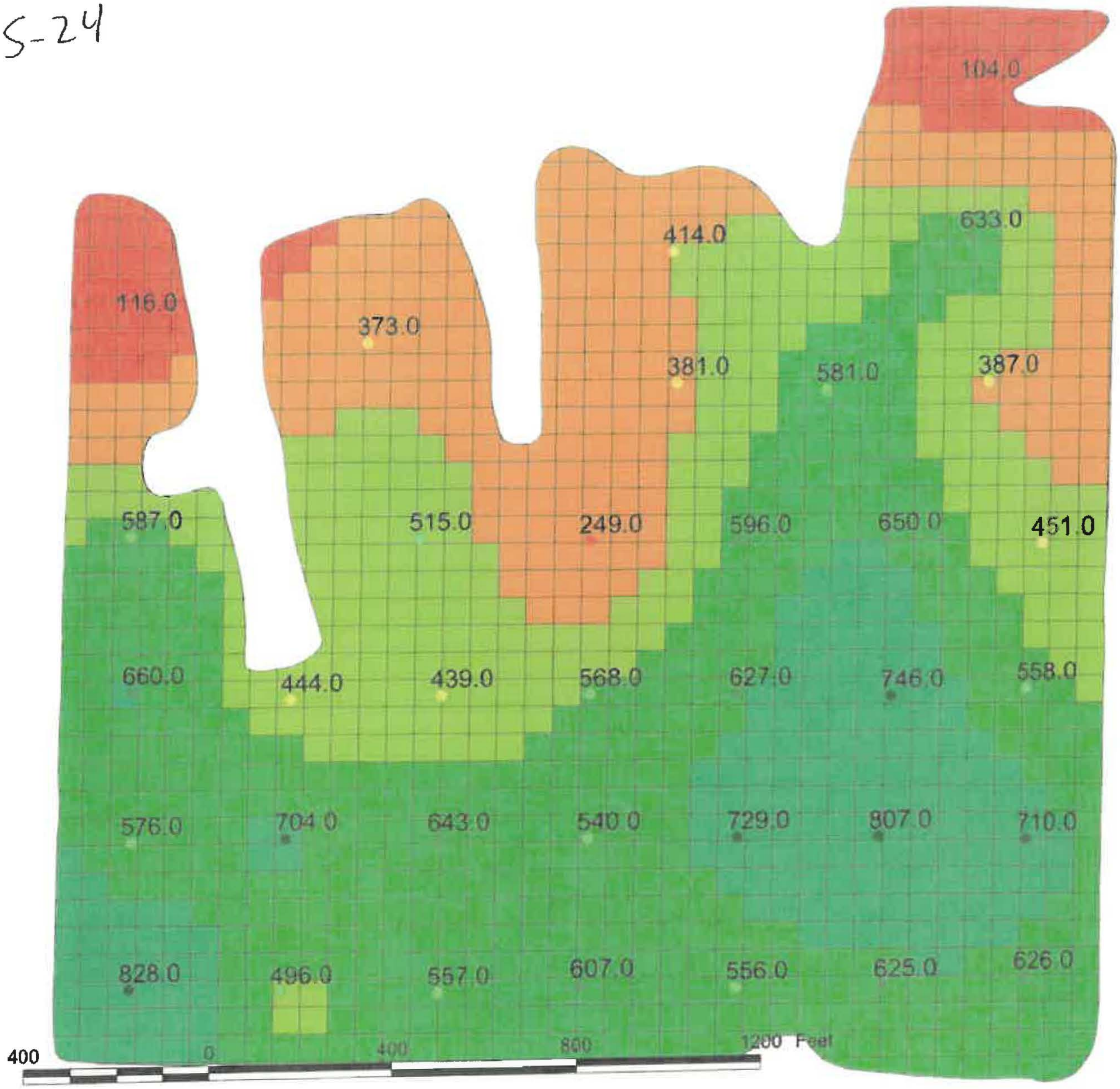
- pH
- Phosphorus (P as indicated by Bray P1 test)
- Potassium (K)

{INSERT SOIL TESTS}

		Soil Tests						
Field ID	Owner	Bailey	Shan	Eckel	HolBaugh	Lynch	P	K
B-1	HolBaugh (fka Bailey)	Feb-2019					27	410
B-2	HolBaugh (fka Bailey)	Feb-2019					33	642
B-3	HolBaugh (fka Bailey)	Feb-2019					36	665
B-4	HolBaugh (fka Bailey)	Feb-2019					25	510
B-5	HolBaugh (fka Bailey)	Feb-2019					50	443
B-6	HolBaugh (fka Bailey)	Feb-2019					71	633
B-7	HolBaugh (fka Bailey)	Feb-2019					71	633
B-8	HolBaugh (fka Bailey)	Feb-2019					71	633
B-9	HolBaugh (fka Bailey)	Feb-2019					71	633
B-10	HolBaugh (fka Bailey)	Feb-2019					65	663
B-11	HolBaugh (fka Bailey)	Feb-2019					166	609
B-12	HolBaugh (fka Bailey)	Feb-2019					166	609
B-21	HolBaugh (fka Bailey)	Feb-2019					43	450
B-22	HolBaugh (fka Bailey)	Feb-2019					36	665
B-22A	HolBaugh (fka Bailey)	Feb-2019					30	577
S-24	Shan		Mar-23					
S-25	Shan		Mar-23					
S-27	Shan		Mar-23					
S-28	Shan		Mar-23					
S-29	Shan		Mar-23					
S-30	Shan		Mar-23					
S-31	Shan		Mar-23					
S-32	Shan		Mar-23					
S-33	Shan		Mar-23					
S-34	Shan		Mar-23					
S-35	Shan		Mar-23					
S-36	Shan		Mar-23					
H-36	Atteberry				Dec-2011		51	382
H-37	HolBaugh				Feb-2019		27	410
H-38	HolBaugh				Nov-2020			
E-16	Eckel			Apr-2013			57	396
E-17	Eckel			Apr-2013			51	429
E-18	Eckel			Apr-2013			53	481
E-19	Eckel			Apr-2013			35	380
E-20	Eckel			Apr-2013			50	292
E-35	Eckel			Apr-2013			50	292
E-38 E	Eckel			Apr-2013			34	217
E-38 S	Eckel			Apr-2013			57	326
E-38 N	Eckel			Apr-2013			52	288
L-39	Lynch					Oct-2018	48	226

trimmer south; 23 (98.19 ac.) - Sample Pts - K

S-24



Date: Mar 15, 2023
Field Name: trimmer south; 23
Location: Wayne Co., Illinois, U.S.
Section 6, T1N, R9E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 98.19
Field Boundary Start Location:
Latitude: 38.55006028
Longitude: -88.25697392
No. of Observations: 35
Minimum K: 104.0
Maximum K: 828.0
Average K: 545.2

Sample Pts - K
104.0 - 249.0
249.0 - 451.0
451.0 - 587.0
587.0 - 660.0
660.0 - 828.0
Clipped K Surface
93.0 - 259.1
259.1 - 413.6
413.6 - 534.0
534.0 - 654.6
654.6 - 821.9
(98.2ac.)Field Boundary

BLACKLOG AG SERVICES

BLACKLOG AG SERVICES

BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

CLIENT:

DATE: 3/15/23

FARM/FIELD ID : TRIMMER SOUTH

5-24

ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

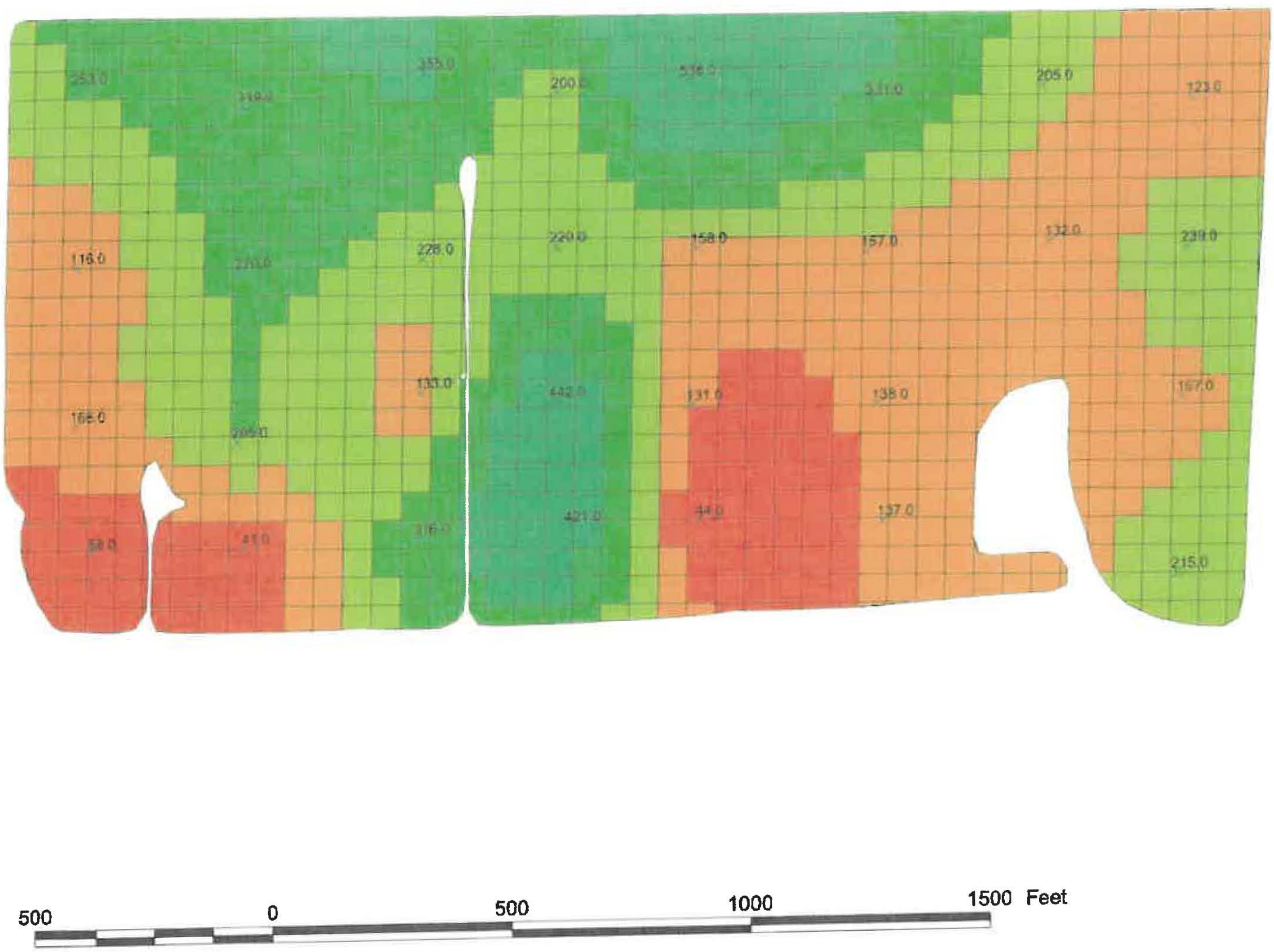
GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6.9	2.6	74	828	2516	248	8.6	2.6	73.1	12.0	12.3								
2	6.8	2.4	27	496	2721	171	8.5	4.1	80.0	8.4	7.5								
3	5.5	2	44	557	1317	103	6.3	29.6	52.3	6.8	11.3								
4	5.8	2.7	34	607	1963	161	8.4	24.3	58.4	8.0	9.3								
5	6.5	2.5	53	556	2626	184	8.9	9.6	73.8	8.6	8.0								
6	6.4	1.8	103	625	2205	119	7.7	11.6	71.6	6.4	10.4								
7	6.7	2.2	77	626	2827	166	9.1	5.9	77.7	7.6	8.8								
8	6.3	2.3	51	710	1997	173	7.7	14.0	64.8	9.4	11.8								
9	6.5	2.2	95	807	2014	177	7.6	10.4	66.3	9.7	13.6								
10	7	2.1	32	729	2375	122	7.4	0.0	80.2	6.9	12.6								
11	6.2	2.3	23	540	2266	149	8.4	17.0	67.4	7.4	8.2								
12	6.4	2.3	32	643	2281	141	8.1	12.1	70.4	7.3	10.2								
13	6.6	2.2	49	704	2569	151	8.7	8.6	73.8	7.2	10.4								
14	6.5	2	32	576	1923	140	6.8	9.8	70.7	8.6	10.9								
15	6.6	2.3	36	660	2451	183	8.4	7.9	72.9	9.1	10.1								
16	6.4	2.6	27	587	2214	184	8.0	11.8	69.2	9.6	9.4								
17	6.2	2.2	18	116	1977	120	6.7	16.5	73.8	7.5	2.2								
18	6.1	2	77	444	1924	141	7.3	18.3	65.9	8.0	7.8								
19	6.3	2	29	439	2195	113	7.6	14.2	72.2	6.2	7.4								
20	6.6	0.8	27	568	2692	215	9.1	8.2	74.0	9.8	8.0								
21	6.5	2	129	627	2116	189	7.6	9.4	69.6	10.4	10.6								
22	6.4	2.3	46	746	2311	179	8.5	11.9	68.0	8.8	11.3								
23	6.5	2.1	66	558	2198	196	7.8	9.9	70.4	10.5	9.2								
24	6.4	2.1	70	451	2435	217	8.6	12.0	70.8	10.5	6.7								
25	6.7	1.8	131	650	2627	217	8.8	5.6	74.6	10.3	9.5								

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
26	6.7	2.3	68	596	2908	231	9.6	6.3	75.7	10.0	8.0								
27	6.7	2.2	84	249	2440	178	7.6	5.7	80.3	9.8	4.2								
28	6.5	2.2	22	515	2196	152	7.5	9.6	73.2	8.4	8.8								
29	6.7	2.3	24	373	2700	125	8.3	6.6	81.3	6.3	5.8								
30	7.3	2.1	145	381	2417	198	7.4	0.0	81.7	11.1	6.6								
31	7.1	2	88	581	2822	192	8.6	0.0	82.0	9.3	8.7								
32	6.7	1.9	67	387	1684	122	5.6	6.8	75.2	9.1	8.9								
33	6.9	2.1	65	633	2648	203	8.4	1.4	78.8	10.1	9.7								
34	6.6	1.9	27	414	2590	136	8.3	8.8	78.0	6.8	6.4								
35	6.2	2.1	40	104	2666	138	8.8	16.3	75.7	6.5	1.5								
	6.5	2.1	57	545	2337	167	8.0	9.9	72.7	8.6	8.7								

80 Of 200; 23 (74.75 ac.) - Clipped P Surface: P

S-25



Date: Mar 20, 2023
Field Name: 80 Of 200; 23
Location: Wayne Co., Illinois, U.S.
Section 1, T1N, R8E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 74.75
Field Boundary Start Location:
Latitude: 38.54379111
Longitude: -88.26623982
No. of Observations: 981
Minimum P: 46.3
Maximum P: 518.0
Average P: 214.9

Sample Pts
Clipped P Surface: P
46.0 - 120.0 (7.5 ac.)
120.0 - 185.3 (23.5 ac.)
185.3 - 254.6 (21.2 ac.)
254.6 - 342.4 (15.5 ac.)
342.4 - 518.0 (7.1 ac.)
(74.8ac.)Field Boundary

BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

DATE: 3/20/23

FARM/FIELD ID : 80 OF 200

S-25

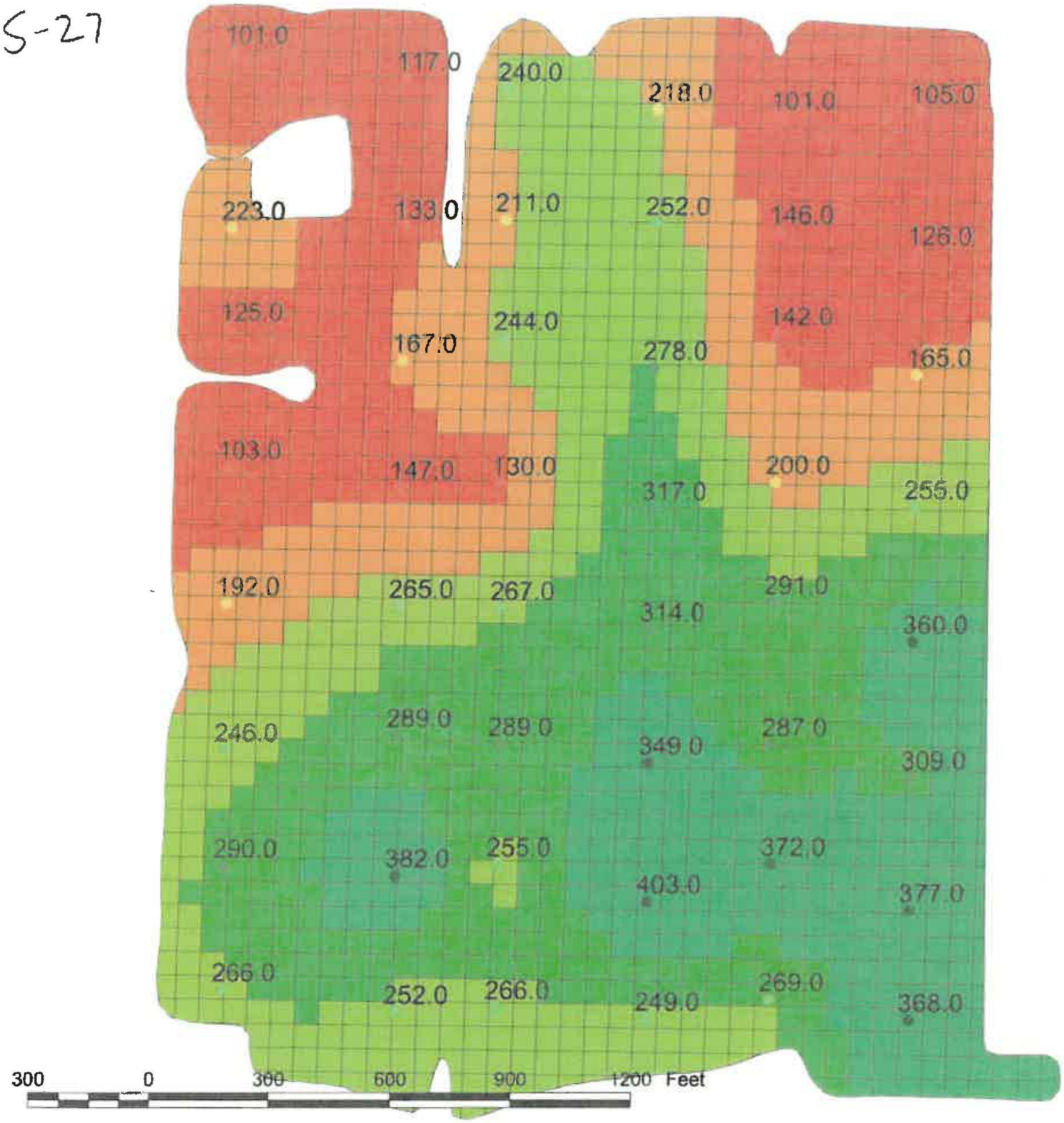
GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6.3	2.2	123	349	1929	220	7.2	14.1	67.0	12.7	6.2								
2	6.6	2	239	300	1977	257	7.0	8.6	70.6	15.3	5.5								
3	6.3	2.1	167	451	1940	245	7.5	14.0	64.7	13.6	7.7								
4	5.9	2.1	215	401	1767	284	7.8	21.6	56.6	15.2	6.6								
5	6.1	2.4	132	443	1980	283	8.2	18.3	60.4	14.4	6.9								
6	6	2.2	205	405	2179	309	9.1	20.3	59.9	14.1	5.7								
7	5.6	2.2	331	340	2263	341	10.4	27.7	54.4	13.7	4.2								
8	6.6	2.2	157	388	2819	378	9.9	7.9	71.2	15.9	5.0								
9	6.4	2.4	138	417	2185	250	8.0	12.0	68.3	13.0	6.7								
10	6.6	2.3	137	301	2559	291	8.7	8.2	73.5	13.9	4.4								
11	6.1	2.3	44	186	2239	374	9.0	17.9	62.2	17.3	2.6								
12	6.5	2.4	131	398	2430	262	8.5	9.7	71.5	12.8	6.0								
13	5.9	1.9	158	280	1792	182	7.1	21.1	63.1	10.7	5.1								
14	6.3	2.2	536	232	2850	368	10.5	14.7	67.9	14.6	2.8								
15	6.5	2.2	200	410	2518	324	9.1	10.2	69.2	14.8	5.8								
16	6.4	2.1	220	296	2600	275	9.1	11.8	71.4	12.6	4.2								
17	6.5	2.5	442	388	2684	373	9.7	9.7	69.2	16.0	5.1								
18	7.1	2.5	421	457	2984	413	9.8	0.0	76.1	17.6	6.0								
19	6.8	2.5	316	295	2571	341	8.6	4.4	74.7	16.5	4.4								
20	6	2.3	133	224	2431	250	9.3	20.4	65.3	11.2	3.1								
21	6.6	2.1	228	468	2448	261	8.5	8.1	72.0	12.8	7.1								
22	6.4	2.3	355	384	2610	357	9.7	12.3	67.3	15.3	5.1								
23	6.5	2.6	319	407	2583	403	9.6	9.8	67.3	17.5	5.4								
24	6.8	2.3	270	372	2800	350	9.3	3.9	75.3	15.7	5.1								
25	6.6	2.2	265	386	2982	383	10.4	8.2	71.7	15.3	4.8								

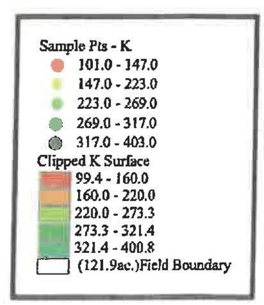
Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
26	6	2.7	41	339	3111	311	11.9	20.0	65.4	10.9	3.7								
27	6.1	2	68	121	2190	104	7.4	18.0	74.0	5.9	2.1								
28	6.7	2.2	166	221	2802	277	9.0	6.3	77.8	12.8	3.1								
29	6.5	2.7	116	473	2446	253	8.6	9.5	71.1	12.3	7.1								
30	6.6	2.6	253	369	2597	289	8.9	8.3	72.9	13.5	5.3								
	6.4	2.3	218	350	2442	300	8.9	12.6	68.4	13.9	5.1								

trimmer north; 23 (121.94 ac.) - Sample Pts - K

S-27



Date: Mar 15, 2023
Field Name: trimmer north; 23
Location: Wayne Co., Illinois, U.S.
Section 31, T2N, R9E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 121.94
Field Boundary Start Location:
Latitude: 38.56203160
Longitude: -88.24988978
No. of Observations: 48
Minimum K: 101.0
Maximum K: 403.0
Average K: 238.6



BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

DATE: 3/15/23

FARM/FIELD ID : TRIMMER NORTH

S-27

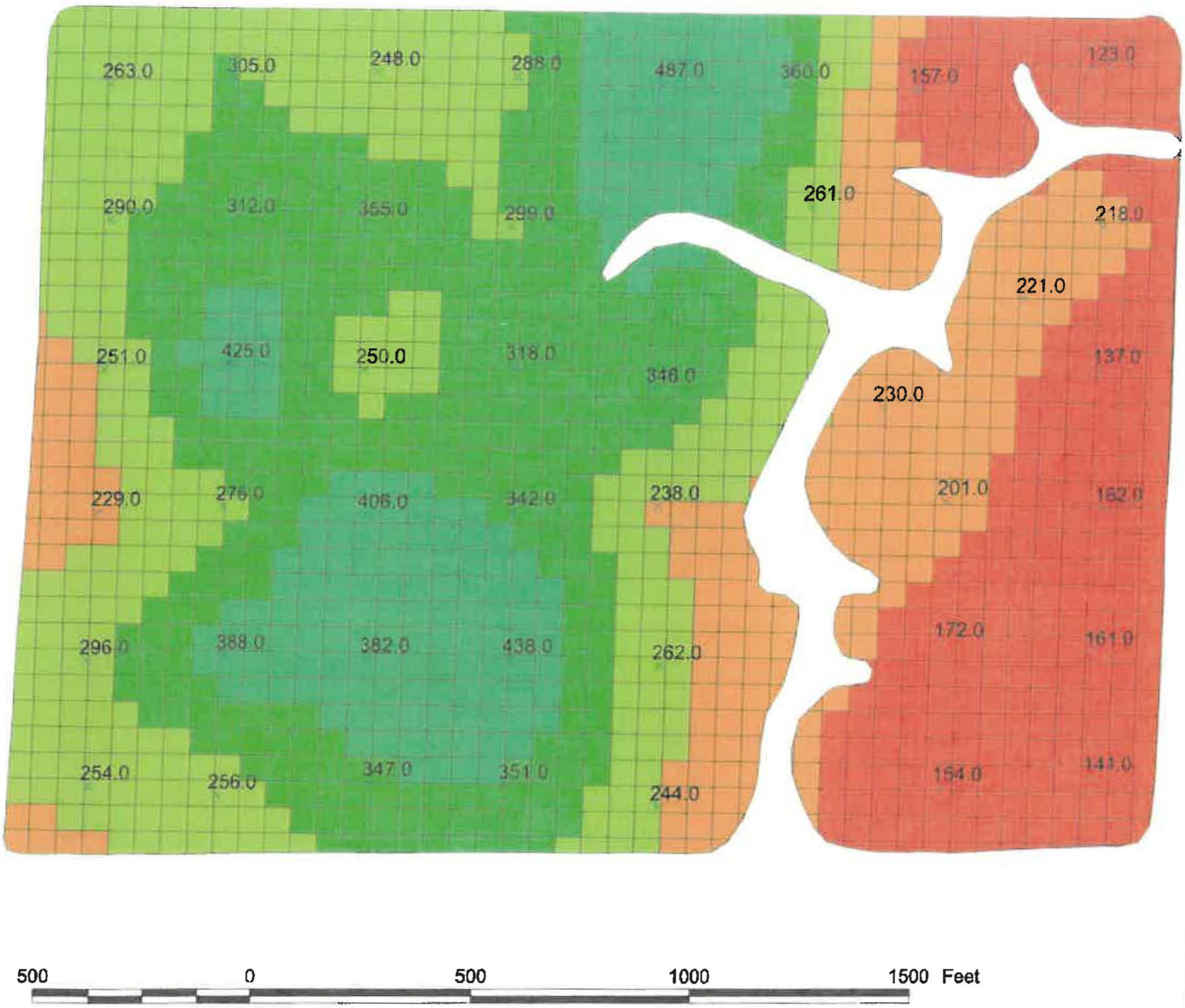
GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6.9	2.1	34	266	2593	175	7.7	1.9	84.2	9.5	4.4								
2	7.1	1.9	48	290	2574	129	7.3	0.0	88.2	7.4	5.1								
3	6.4	1.9	48	246	1962	115	6.5	12.2	75.5	7.4	4.9								
4	6.7	2.1	36	192	2540	149	7.7	6.2	82.5	8.1	3.2								
5	6.8	2	31	103	2660	134	7.6	3.5	87.5	7.3	1.7								
6	6.5	2.5	27	125	2600	183	8.2	9.4	79.3	9.3	2.0								
7	6.3	2.9	31	223	3228	250	11.0	14.5	73.4	9.5	2.6								
8	6.4	2.7	26	101	3076	226	9.9	11.5	77.7	9.5	1.3								
9	6.6	2.3	27	117	2922	175	8.9	8.0	82.1	8.2	1.7								
10	6.5	2.3	30	133	2493	149	7.8	9.9	79.9	8.0	2.2								
11	6.4	2.1	32	167	2576	155	8.3	12.0	77.6	7.8	2.6								
12	6.8	1.9	32	147	1893	108	5.6	4.1	84.5	8.0	3.4								
13	6.9	1.9	53	265	2532	125	7.3	1.5	86.7	7.1	4.7								
14	6.9	2	45	289	2623	129	7.6	1.7	86.3	7.1	4.9								
15	7.1	2.3	45	382	2775	148	8.0	0.0	86.7	7.7	6.1								
16	7	2	37	252	2218	115	6.3	0.0	88.0	7.6	5.1								
17	7.1	1.9	42	266	2349	102	6.6	0.0	89.0	6.4	5.2								
18	6.6	1.8	45	255	1975	106	6.2	8.0	79.6	7.1	5.3								
19	7.1	1.9	31	289	2365	119	6.8	0.0	86.9	7.3	5.4								
20	6.9	2.2	28	267	2457	139	7.2	1.9	85.3	8.0	4.8								
21	6.8	1.9	26	130	2065	115	6.0	3.2	86.0	8.0	2.8								
22	6.8	2.3	24	244	2717	184	8.2	4.1	82.8	9.3	3.8								
23	6.1	2.4	42	211	2037	118	7.1	17.6	71.7	6.9	3.8								
24	6	2.1	41	240	1931	123	7.1	20.5	68.0	7.2	4.3								
25	6.1	2.1	29	218	2544	124	8.7	17.8	73.1	5.9	3.2								

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
26	6.4	2.2	45	252	3034	146	9.7	12.2	78.2	6.3	3.3								
27	6.5	2.3	37	278	3295	185	10.4	10.0	79.2	7.4	3.4								
28	7	1.9	37	317	2800	140	8.0	0.0	87.5	7.3	5.1								
29	7	2	23	314	2717	120	7.7	0.0	88.2	6.5	5.2								
30	7.3	1.7	41	349	2402	113	6.9	0.0	87.0	6.8	6.5								
31	6.7	1.9	66	403	3198	183	9.9	6.3	80.8	7.7	5.2								
32	6.6	1.7	26	249	2111	112	6.6	8.1	80.0	7.1	4.8								
33	6.8	1.6	31	269	1874	121	5.8	4.6	80.8	8.7	5.9								
34	7.1	1.7	41	372	2458	118	7.1	0.0	86.5	6.9	6.7								
35	7.2	1.5	35	287	2184	120	6.3	0.0	86.7	7.9	5.8								
36	7.1	1.8	21	291	2170	106	6.2	0.0	87.5	7.1	6.0								
37	6.4	1.9	24	200	2052	107	6.6	11.6	77.7	6.8	3.9								
38	5.3	2.3	28	142	1569	1146	13.5	34.2	29.1	35.4	1.3								
39	6	2.5	25	146	2718	179	9.7	20.3	70.1	7.7	1.9								
40	6.6	2.1	29	101	1821	140	5.7	7.6	79.9	10.2	2.3								
41	6.3	2.4	23	105	2275	136	7.5	14.8	75.8	7.6	1.8								
42	5.6	2.4	23	126	2104	172	8.5	27.8	61.9	8.4	1.9								
43	6.3	1.8	25	165	1854	107	6.2	14.6	74.8	7.2	3.4								
44	6.4	1.9	24	255	2062	117	6.8	12.2	75.8	7.2	4.8								
45	6.7	1.8	40	360	2337	130	7.3	6.3	80.0	7.4	6.3								
46	7	1.7	38	309	2457	119	7.0	0.0	87.8	7.1	5.7								
47	7.2	1.8	32	377	2632	109	7.5	0.0	87.7	6.1	6.4								
48	7.1	1.8	34	368	2693	124	7.7	0.0	87.4	6.7	6.1								
	6.7	2.0	34	239	2428	159	7.7	7.5	80.3	8.2	4.1								

120 of 200; 23 (109.08 ac.) - Clipped K Surface: K

S-28



Sample Pts
Clipped K Surface: K
124.0 - 188.8 (21.2 ac.)
188.8 - 244.5 (16.4 ac.)
244.5 - 299.1 (26.4 ac.)
299.1 - 357.9 (29.4 ac.)
357.9 - 473.2 (15.8 ac.)
(109.1ac.)Field Boundary

Date: Mar 20, 2023
Field Name: 120 of 200; 23
Location: Wayne Co., Illinois, U.S.
Section 1, T1N, R8E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 109.08
Field Boundary Start Location:
Latitude: 38.54479609
Longitude: -88.25715741
No. of Observations: 1444
Minimum K: 124.1
Maximum K: 473.2
Average K: 269.6

BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

DATE: 3/20/23

FARM/FIELD ID : 120 OF 200

5-28

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

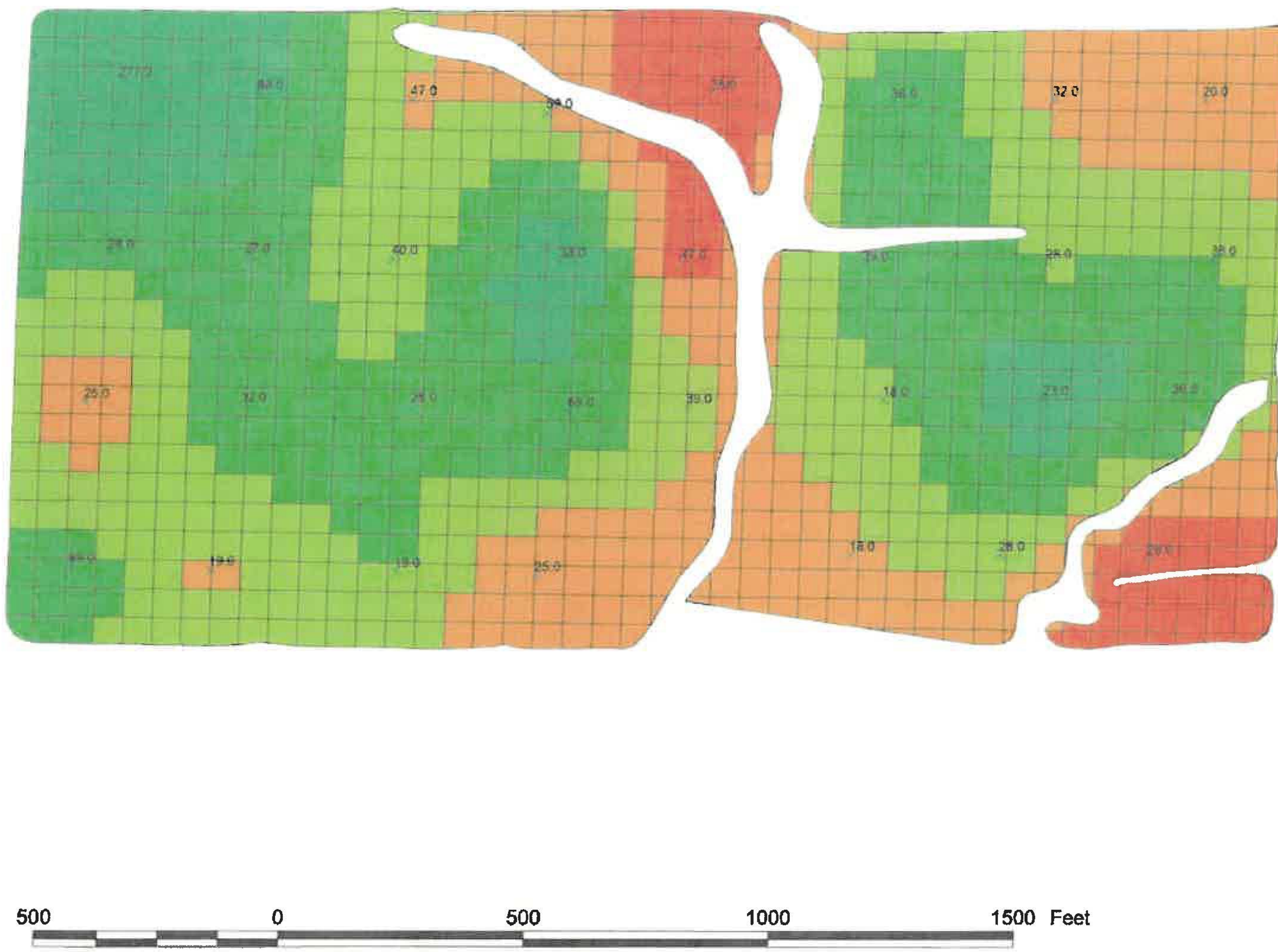
GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6	2.8	18	123	2633	159	9.3	20.4	70.8	7.1	1.7								
2	5.9	2.5	171	157	2551	278	9.9	21.9	64.4	11.7	2.0								
3	6.6	2.3	445	360	2566	397	9.3	8.2	69.0	17.8	5.0								
4	6	2.7	452	261	2439	423	10.2	19.6	59.8	17.3	3.3								
5	6.4	2.6	237	487	2506	318	9.3	11.7	67.4	14.2	6.7								
6	6.4	2.7	556	346	2536	433	9.7	11.4	65.4	18.6	4.6								
7	6.3	2.4	169	238	2076	184	7.3	14.2	71.1	10.5	4.2								
8	6.1	2.2	88	262	1971	133	7.1	18.1	69.4	7.8	4.7								
9	6.2	2.2	53	244	1909	101	6.6	16.6	72.3	6.4	4.7								
10	6	2.1	75	351	1490	123	5.9	20.6	63.1	8.7	7.6								
11	6.6	2.4	236	438	1832	262	6.8	8.2	67.4	16.1	8.3								
12	6.1	2.2	122	342	1771	138	6.6	17.6	67.1	8.7	6.6								
13	6.5	2.3	361	318	2245	274	7.9	9.3	71.0	14.5	5.2								
14	6.1	2.8	263	299	2072	324	8.4	17.6	61.7	16.1	4.6								
15	6.5	2.6	308	288	2607	384	9.4	9.8	69.3	17.0	3.9								
16	6.5	2.5	143	248	2560	268	8.7	9.9	73.6	12.8	3.7								
17	6.6	2.3	276	355	2198	288	7.8	8.4	70.4	15.4	5.8								
18	6.4	2.7	223	250	2565	326	9.2	12.0	69.7	14.8	3.5								
19	6.9	2.2	95	406	1911	138	6.0	2.1	79.6	9.6	8.7								
20	5.5	2.1	189	382	1544	121	6.9	29.7	55.9	7.3	7.1								
21	6.2	2.3	74	347	1949	166	7.2	16.5	67.7	9.6	6.2								
22	6.5	2.4	280	256	2317	226	7.8	9.4	74.3	12.1	4.2								
23	6.4	2.5	111	388	2023	201	7.3	12.4	69.3	11.5	6.8								
24	6.2	2.5	445	276	1978	317	7.9	16.2	62.6	16.7	4.5								
25	6.5	2.4	352	425	2078	266	7.6	9.8	68.4	14.6	7.2								

Sample ID	WpH	OM	P lbs./A	K lbs./A	Ca lbs./A	Mg lbs./A	CEC	Percent Saturation H	Ca	Mg	K	S lbs./A	Zn lbs./A	Fe lbs./A	Mn lbs./A	Cu lbs./A	B lbs./A	Na lbs./A	
26	6.2	2.7	295	312	2223	295	8.6	16.4	64.6	14.3	4.7								
27	6.7	2.9	398	305	2786	342	9.4	6.5	74.1	15.2	4.2								
28	6.7	2.3	303	263	2588	355	8.8	5.9	73.5	16.8	3.8								
29	6.5	2.4	181	290	2231	301	8.0	10.0	69.7	15.7	4.6								
30	6.6	3	371	251	2637	485	9.7	7.9	68.0	20.8	3.3								
31	6.3	2.6	90	229	1996	182	7.1	14.9	70.3	10.7	4.1								
32	6.6	2.7	138	296	2261	280	7.8	7.6	72.5	15.0	4.9								
33	6.5	2.9	148	254	2362	356	8.6	10.3	68.7	17.2	3.8								
34	6.1	2.8	115	218	2511	343	9.7	17.7	64.7	14.7	2.9								
35	6.2	3	128	137	2701	278	9.7	16.7	69.6	11.9	1.8								
36	6.3	3.1	263	162	2900	375	10.6	14.9	68.4	14.7	2.0								
37	6.3	2.8	184	161	2811	321	10.0	14.2	70.3	13.4	2.1								
38	6.4	2.3	260	141	2589	278	8.9	12.3	72.7	13.0	2.0								
39	6.4	2.5	220	154	2264	349	8.3	11.9	68.2	17.5	2.4								
40	6.2	2.4	206	172	1974	254	7.5	17.2	65.8	14.1	2.9								
41	6.1	2.5	77	201	1989	183	7.3	18.0	68.1	10.4	3.5								
42	6.2	2.5	150	230	2174	260	8.2	16.9	66.3	13.2	3.6								
43	5.8	2.8	84	221	2616	396	11.2	24.4	58.4	14.7	2.5								
	6.3	2.5	218	275	2278	276	8.4	13.8	68.2	13.5	4.4								

hohlbaugh 80; 23 (71.68 ac.) - Clipped K Surface: K

S-29



Date: Mar 20, 2023
Field Name: hohlbaugh 80; 23
Location: Wayne Co., Illinois, U.S.
Section 12, T1N, R8E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 71.68
Field Boundary Start Location:
Latitude: 38.54014746
Longitude: -88.27536020
No. of Observations: 1007
Minimum K: 103.2
Maximum K: 427.2
Average K: 250.1

Sample Pts
Clipped K Surface: K
103.2 - 174.7 (4.5 ac.)
174.7 - 225.8 (14.7 ac.)
225.8 - 266.7 (22.9 ac.)
266.7 - 324.9 (22.8 ac.)
324.9 - 427.3 (6.8 ac.)
(71.7ac.)Field Boundary

BLACKLOG AG SERVICES

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1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

CLIENT:

DATE: 3/20/23

FARM/FIELD ID : HOHLBAUGH 80

S-29

ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

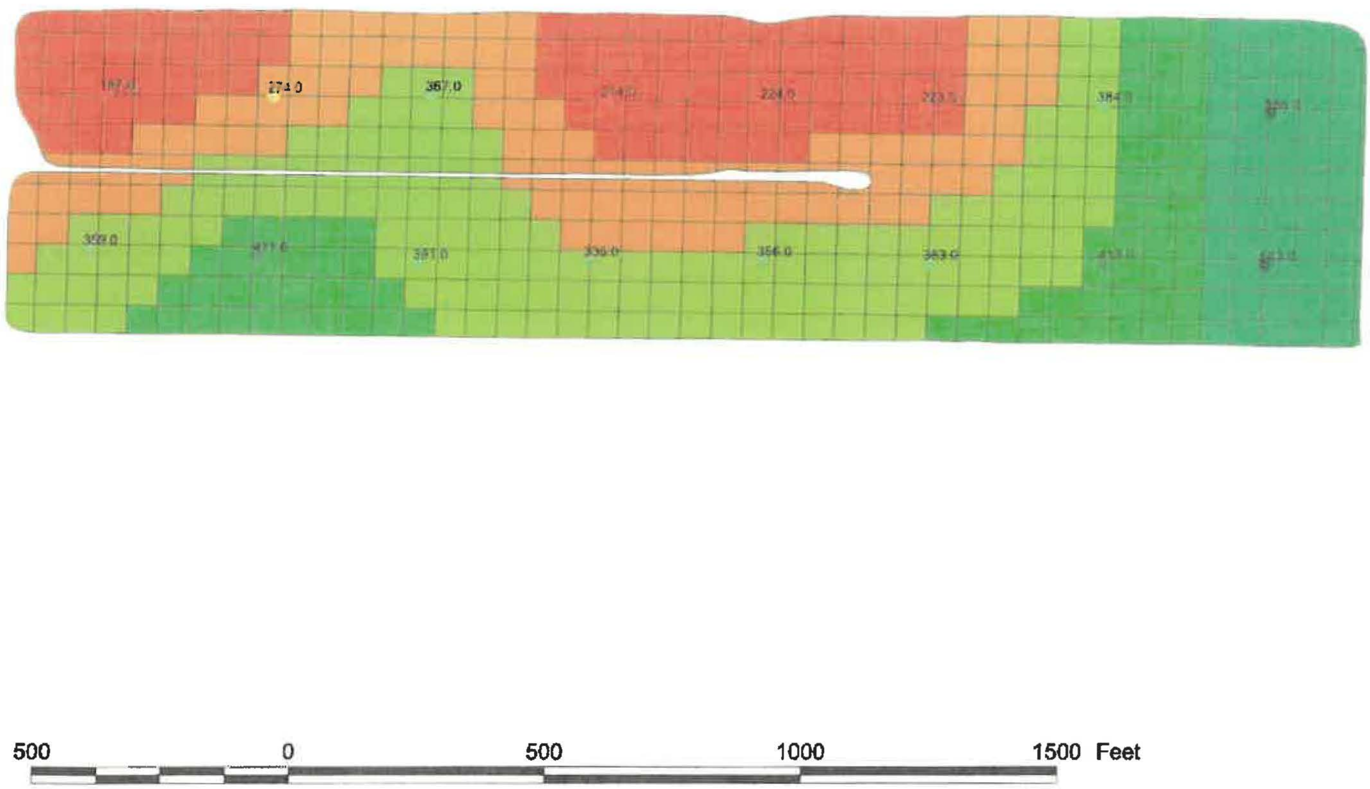
GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6.6	2.6	277	431	2937	139	9.2	7.9	79.8	6.3	6.0								
2	6.8	2.5	88	339	2581	109	7.6	3.4	84.9	6.0	5.7								
3	6.3	2.1	47	222	2221	108	7.4	15.1	75.0	6.1	3.8								
4	6.8	2.8	59	221	2724	162	8.1	4.1	84.1	8.3	3.5								
5	6.2	2.6	38	101	2463	105	8.1	17.0	76.0	5.4	1.6								
6	6.7	2.5	36	309	2660	129	8.1	6.4	82.1	6.6	4.9								
7	6.7	2.4	32	211	2530	118	7.5	5.5	84.3	6.6	3.6								
8	6.5	2.1	20	192	2212	115	6.9	9.4	80.1	6.9	3.6								
9	6.6	2.2	38	268	2156	125	6.8	7.9	79.3	7.7	5.1								
10	6.4	2.1	28	255	2481	118	8.0	12.3	77.5	6.1	4.1								
11	6.6	2.2	39	297	2596	123	8.0	7.7	81.1	6.4	4.8								
12	7.2	2.7	47	166	3353	118	9.1	0.0	92.1	5.4	2.3								
13	6.9	2.2	33	386	2601	126	7.7	2.4	84.4	6.8	6.4								
14	6.6	2.2	40	232	2521	112	7.7	8.1	81.9	6.1	3.9								
15	6.6	2.1	27	289	2459	127	7.7	8.5	79.8	6.9	4.8								
16	6.6	2.3	28	277	2481	156	7.9	8.8	78.5	8.2	4.5								
17	7.1	1.9	25	188	2446	113	6.8	0.0	89.9	6.9	3.5								
18	7	2.5	32	303	3036	202	8.8	0.0	86.3	9.6	4.4								
19	6.5	2	28	270	2296	106	7.2	9.4	79.7	6.1	4.8								
20	7.2	2.3	66	313	2737	131	7.8	0.0	87.7	7.0	5.1								
21	6.7	2.8	39	234	3604	232	10.9	5.6	82.7	8.9	2.8								
22	7.1	2.2	18	259	3101	158	8.7	0.0	89.1	7.6	3.8								
23	6.9	2.5	23	383	2413	127	7.2	2.1	83.8	7.3	6.8								
24	6.9	2.3	36	321	2973	174	8.7	1.6	85.4	8.3	4.7								
25	5.7	2.6	28	111	2048	154	8.0	26.2	64.0	8.0	1.8								

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
26	6.6	2.7	28	249	2981	194	9.4	8.7	79.3	8.6	3.4								
27	6.9	2	18	209	2971	138	8.4	1.6	88.4	6.8	3.2								
28	6.7	2.4	25	177	3213	144	9.4	5.7	85.5	6.4	2.4								
29	6.8	2.4	19	272	3219	166	9.5	4.3	84.7	7.3	3.7								
30	7	2.2	19	218	2989	158	8.4	0.0	89.0	7.8	3.3								
31	7.1	2.2	89	294	2728	159	7.9	0.0	86.3	8.4	4.8								
	6.7	2.3	44	258	2701	140	8.2	6.1	82.7	7.1	4.1								

Ernies 40; 23 (38.43 ac.) - Sample Pts - K

S-30



Date: Mar 15, 2023
Field Name: Ernies 40; 23
Location: Wayne Co., Illinois, U.S.
Section 1, T1N, R8E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 38.43
Field Boundary Start Location:
Latitude: 38.54466794
Longitude: -88.27542297
No. of Observations: 16
Minimum K: 187.0
Maximum K: 586.0
Average K: 356.9

Sample Pts - K
- 187.0 - 224.0
- 224.0 - 274.0
- 274.0 - 391.0
- 391.0 - 471.0
- 471.0 - 586.0

Clipped K Surface
- 178.7 - 259.5
- 259.5 - 331.4
- 331.4 - 405.6
- 405.6 - 493.1
- 493.1 - 586.0

(38.4ac.)Field Boundary

BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

DATE: 3/15/23

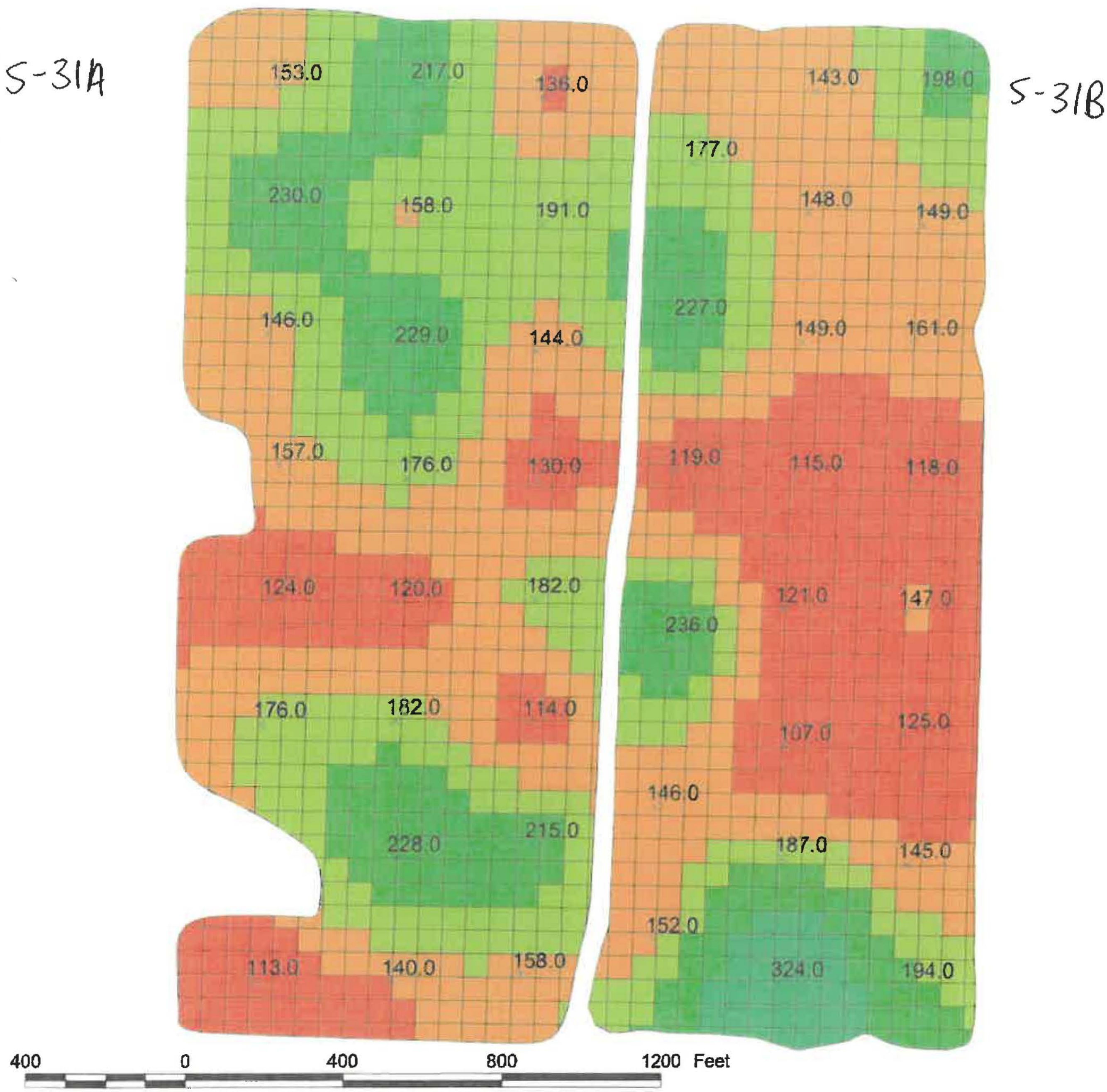
FARM/FIELD ID: ERNIES 40

S-30

GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6.7	2.4	168	187	2528	332	8.5	6.5	74.4	16.3	2.8								
2	6.2	2.3	286	274	2133	274	8.2	16.8	65.0	13.9	4.3								
3	6.5	2.3	281	367	2303	327	8.4	9.7	68.5	16.2	5.6								
4	6.5	2.3	186	214	2926	302	9.8	9.8	74.6	12.8	2.8								
5	6.7	2.3	275	224	2803	409	9.6	6.2	73.0	17.8	3.0								
6	6.8	1.9	330	223	2657	291	8.5	4.2	78.1	14.3	3.4								
7	6.6	2.3	432	384	2436	360	8.8	8.2	69.2	17.0	5.6								
8	6.3	2.2	127	586	2398	285	9.3	14.6	64.5	12.8	8.1								
9	6.7	2.2	256	543	2077	298	7.6	6.2	68.3	16.3	9.2								
10	6.3	2.2	316	413	2446	391	9.7	14.7	63.0	16.8	5.5								
11	6.6	2.1	375	383	2530	371	9.1	8.1	69.5	17.0	5.4								
12	6.5	2	369	356	2293	323	8.4	10.4	68.2	16.0	5.4								
13	7.2	2	321	336	3024	321	9.3	0.0	81.3	14.4	4.6								
14	6.9	2	389	391	2443	387	8.4	2.1	72.7	19.2	6.0								
15	7	2.2	251	471	2292	342	7.8	0.0	73.5	18.3	7.7								
16	6.3	2.4	360	359	2201	326	8.6	14.8	64.0	15.8	5.4								
AVERAGE	6.6	2.2	295	357	2468	334	8.8	8.3	70.5	15.9	5.3								

groff; 23 (114.01 ac.) - Clipped K Surface: K



Date: Mar 15, 2023
Field Name: groff; 23
Location: Wayne Co., Illinois, U.S.
Section 31, T2N, R9E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 114.01
Field Boundary Start Location:
Latitude: 38.56300455
Longitude: -88.25687356
No. of Observations: 1498
Minimum K: 109.6
Maximum K: 315.1
Average K: 164.7

Sample Pts
Clipped K Surface: K
109.0 - 142.5 (25.4 ac.)
142.5 - 165.6 (39.1 ac.)
165.6 - 189.6 (29.1 ac.)
189.6 - 233.6 (17.9 ac.)
233.6 - 315.1 (2.5 ac.)
(114.0ac.)Field Boundary

BLACKLOG AG SERVICES

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1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

DATE: 3/15/23

FARM/FIELD ID : GROFF

S-31 A+B

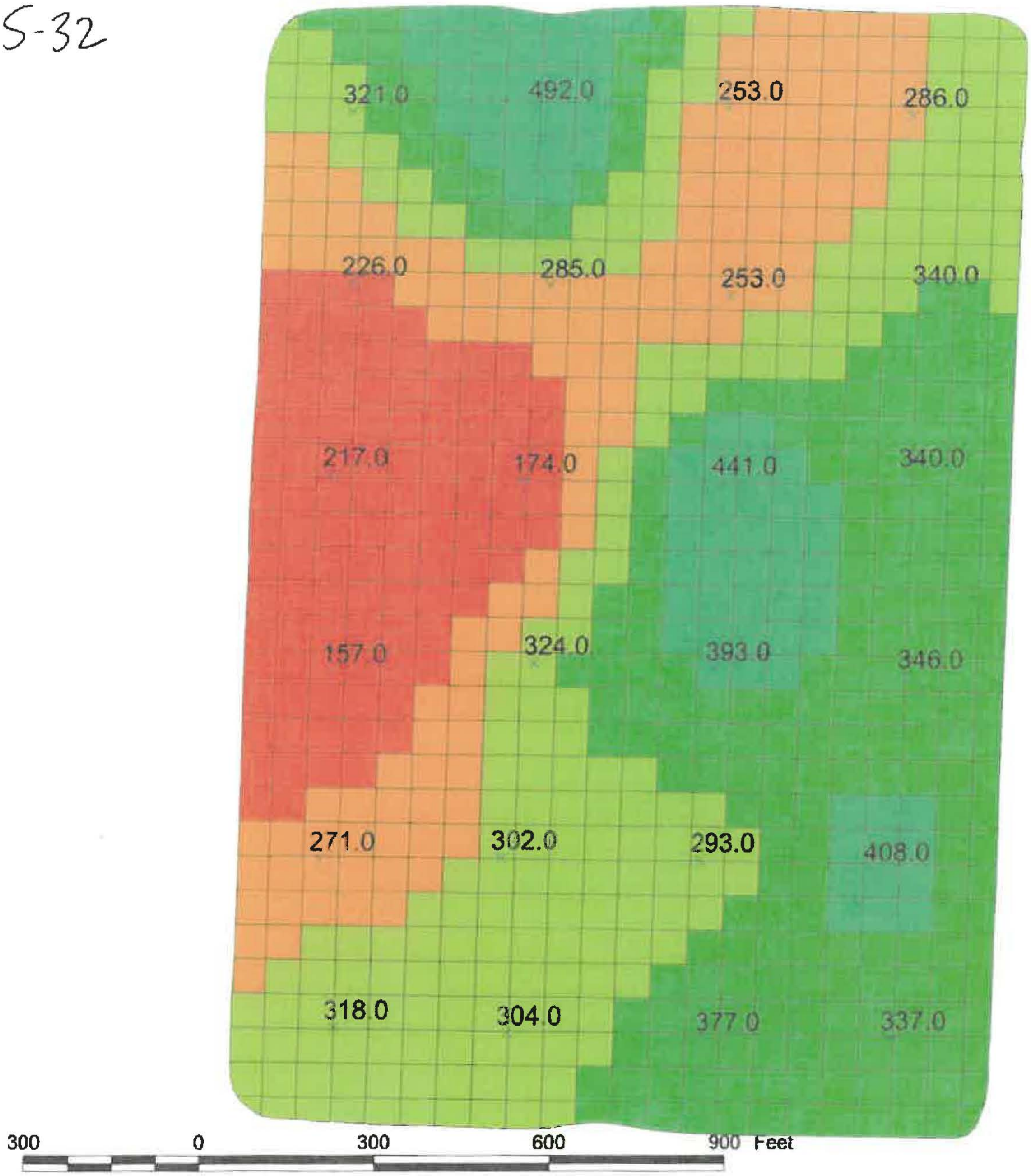
GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	5.4	2.8	32	113	2178	207	9.5	32.1	57.3	9.1	1.5								
2	6.3	2.5	23	176	3110	177	10.2	14.4	76.2	7.2	2.2								
3	6.3	2.7	21	124	2862	162	9.3	14.1	76.9	7.3	1.7								
4	6.3	2.4	81	157	2649	204	9.0	14.8	73.6	9.4	2.2								
5	5.9	2.4	66	146	2485	211	9.3	21.7	66.8	9.5	2.0								
6	6.2	2.5	114	230	2975	321	10.9	16.8	68.2	12.3	2.7								
7	5.8	2.2	41	153	2126	159	8.1	23.8	65.6	8.2	2.4								
8	6.2	2.4	64	217	3103	269	11.0	16.8	70.5	10.2	2.5								
9	6	2.2	48	158	2542	174	9.1	20.0	69.8	8.0	2.2								
10	6.1	2.4	63	229	2592	185	9.2	18.0	70.4	8.4	3.2								
11	5.7	2.3	42	176	2401	170	9.4	26.2	63.9	7.5	2.4								
12	6.2	2.3	50	120	2872	211	9.9	17.0	72.5	8.9	1.6								
13	5.9	2.2	23	182	2283	142	8.3	21.3	68.8	7.1	2.8								
14	6	2.5	33	228	2338	177	8.6	20.0	68.0	8.6	3.4								
15	5.8	2.3	30	140	2053	120	7.7	24.5	66.7	6.5	2.3								
16	5.6	2.1	33	158	1708	104	6.8	27.8	62.8	6.4	3.0								
17	5.5	2.6	55	215	1723	118	7.3	30.5	59.0	6.7	3.8								
18	6.2	2.1	17	114	2691	115	8.8	16.5	76.4	5.4	1.7								
19	6.1	2.4	23	182	2723	151	9.4	18.4	72.4	6.7	2.5								
20	6	2.2	23	130	2545	131	8.8	19.6	72.3	6.2	1.9								
21	5.6	2.1	18	144	2302	151	9.1	27.9	63.2	6.9	2.0								
22	6	2.1	31	191	2733	188	9.8	19.8	69.7	8.0	2.5								
23	5.9	2.2	21	136	2435	170	8.9	21.6	68.4	8.0	2.0								
24	5.9	2.8	23	194	2613	240	9.9	21.4	66.0	10.1	2.5								
25	5.2	2.5	18	145	2642	255	12.2	35.7	54.1	8.7	1.5								

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
26	6.4	2.6	17	125	2507	207	8.3	12.2	75.5	10.4	1.9								
27	6.4	2.2	27	147	2664	309	9.2	11.6	72.4	14.0	2.0								
28	5.7	2.4	22	118	2009	347	8.9	25.7	56.4	16.2	1.7								
29	5.7	2.1	54	161	1730	155	7.0	26.1	61.8	9.2	2.9								
30	6	2.3	22	149	2418	160	8.6	19.7	70.3	7.8	2.2								
31	6.2	2.1	49	198	2712	177	9.3	16.5	72.9	7.9	2.7								
32	5.7	2.1	26	143	2361	129	8.9	25.6	66.3	6.0	2.1								
33	6.3	2.1	25	148	2481	112	8.0	14.3	77.5	5.8	2.4								
34	6.3	2	25	149	2342	129	7.7	14.5	76.0	7.0	2.5								
35	6.4	2.1	31	115	2427	195	8.0	12.2	75.8	10.2	1.8								
36	6.1	2.2	24	121	2449	333	9.4	18.4	65.1	14.8	1.7								
37	5.6	1.9	21	107	1634	256	7.4	28.5	55.2	14.4	1.9								
38	6.3	2.5	20	187	2785	185	9.3	14.2	74.9	8.3	2.6								
39	6.2	2.4	32	324	2783	157	9.6	16.4	72.5	6.8	4.3								
40	5.4	2.6	43	152	1908	136	8.2	32.5	58.2	6.9	2.4								
41	5.5	2.5	39	146	2084	144	8.6	30.2	60.6	7.0	2.2								
42	6	2.6	74	236	2298	105	8.1	20.0	70.9	5.4	3.7								
43	5.9	2.3	40	119	2599	113	9.1	21.7	71.4	5.2	1.7								
44	5.9	2.2	31	227	2224	136	8.2	21.8	67.8	6.9	3.5								
45	5.1	2.4	51	177	1617	121	7.7	38.1	52.5	6.5	2.9								
	5.9	2.3	37	165	2416	180	8.9	21.4	67.9	8.4	2.4								

hohlbaugh; 23 (58.02 ac.) - Clipped K Surface: K

S-32



Date: Mar 20, 2023
Field Name: hohlbaugh; 23
Location: Wayne Co., Illinois, U.S.
Section 2, T1N, R8E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 58.02
Field Boundary Start Location:
Latitude: 38.54474503
Longitude: -88.27569709
No. of Observations: 726
Minimum K: 158.6
Maximum K: 472.3
Average K: 311.7

Sample Pts
Clipped K Surface: K
158.6 - 237.1 (8.4 ac.)
237.1 - 291.2 (10.6 ac.)
291.2 - 333.1 (15.8 ac.)
333.1 - 379.4 (17.1 ac.)
379.4 - 472.3 (6.1 ac.)
(58.0ac.)Field Boundary

BLACKLOG AG SERVICES

BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

BLACKLOG AG SERVICES

DATE: 3/20/23

FARM/FIELD ID: HOHLBAUGH 19

S-32

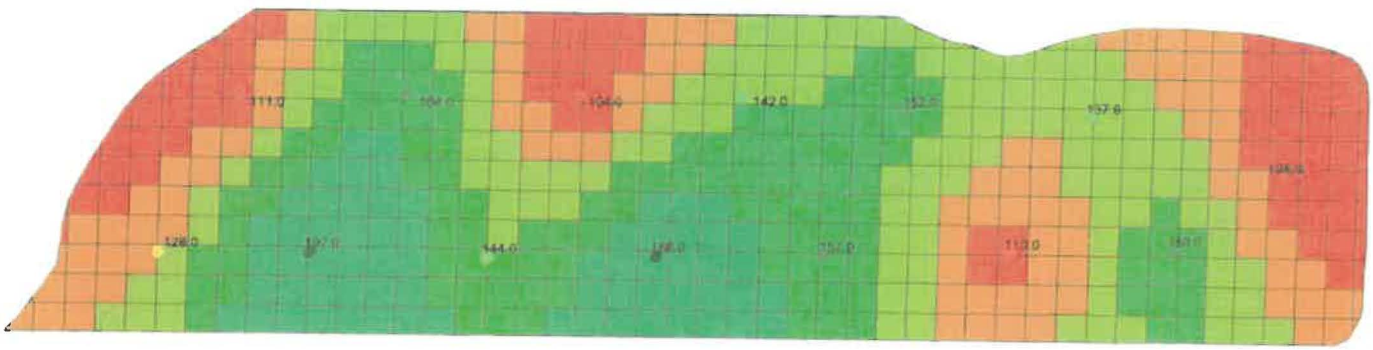
GROWER: MARK & STEVE SHAN FARMS

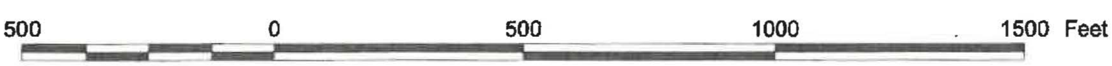
CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6.5	2.8	111	337	2675	132	8.5	9.7	78.7	6.5	5.1								
2	6.4	2.5	70	377	2537	122	8.3	11.7	76.4	6.1	5.8								
3	6.4	2.1	61	304	2399	104	7.7	11.4	77.9	5.6	5.1								
4	6.6	2.1	45	318	2512	112	7.8	8.3	80.5	6.0	5.2								
5	6.7	2.1	47	271	2517	116	7.6	6.2	82.8	6.4	4.6								
6	6.6	2.1	49	302	2673	118	8.2	7.8	81.5	6.0	4.7								
7	6.3	2.1	40	293	2425	115	8.1	14.7	74.8	5.9	4.6								
8	5.7	2.4	31	408	2468	141	9.8	25.7	63.0	6.0	5.3								
9	6.7	2.1	35	346	2777	101	8.3	6.0	83.6	5.1	5.3								
10	6.6	2.2	69	393	2736	118	8.5	7.8	80.5	5.8	5.9								
11	6.7	2	42	324	2502	123	7.6	5.5	82.3	6.7	5.5								
12	6.4	2	29	157	1867	119	6.1	12.1	76.5	8.1	3.3								
13	6.3	2	21	217	2168	101	7.2	15.0	75.3	5.8	3.9								
14	6.3	2	48	174	2495	117	8.1	14.2	77.0	6.0	2.8								
15	6.5	2.1	62	441	2438	100	7.9	10.3	77.2	5.3	7.2								
16	6.1	1.9	48	340	2270	129	8.1	17.9	70.1	6.6	5.4								
17	6.4	2.2	24	340	2712	170	9.0	12.0	75.3	7.9	4.8								
18	6.6	1.9	35	253	2507	103	7.7	8.8	81.4	5.6	4.2								
19	6.7	2	17	285	2476	146	7.6	5.8	81.4	8.0	4.8								
20	6.5	1.9	18	226	2401	133	7.6	9.9	79.0	7.3	3.8								
21	6.8	2.2	32	321	2365	160	7.3	4.3	81.0	9.1	5.6								
22	6.9	2.5	40	492	2539	177	7.9	2.4	80.3	9.3	8.0								
23	6.8	1.9	46	253	2459	101	7.2	4.3	85.4	5.8	4.5								
24	6.7	1.9	54	286	2526	109	7.6	6.1	83.1	6.0	4.8								
AVERAGE	6.5	2.1	45	311	2477	124	7.9	9.9	78.5	6.5	5.0								

East Williams; 23 (37.23 ac.) - Sample Pts - K

S-33





Date: Mar 15, 2023
Field Name: East Williams; 23
Location: Wayne Co., Illinois, U.S.
Section 30, T2N, R9E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 37.23
Field Boundary Start Location:
Latitude: 38.57007756
Longitude: -88.25679712
No. of Observations: 14
Minimum K: 104.0
Maximum K: 197.0
Average K: 142.6

Sample Pts - K
104.0 - 111.0
111.0 - 128.0
128.0 - 144.0
144.0 - 164.0
164.0 - 197.0
Clipped K Surface
106.0 - 119.3
119.3 - 132.2
132.2 - 145.8
145.8 - 163.6
163.6 - 193.9
(37.2ac.)Field Boundary

BLACKLOG AG SERVICES

BLACKLOG AG SERVICES

BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

DATE: 3/15/23

GROWER: MARK STEVE SHAN FARMS

FARM/FIELD ID: EAST WILLIAMS

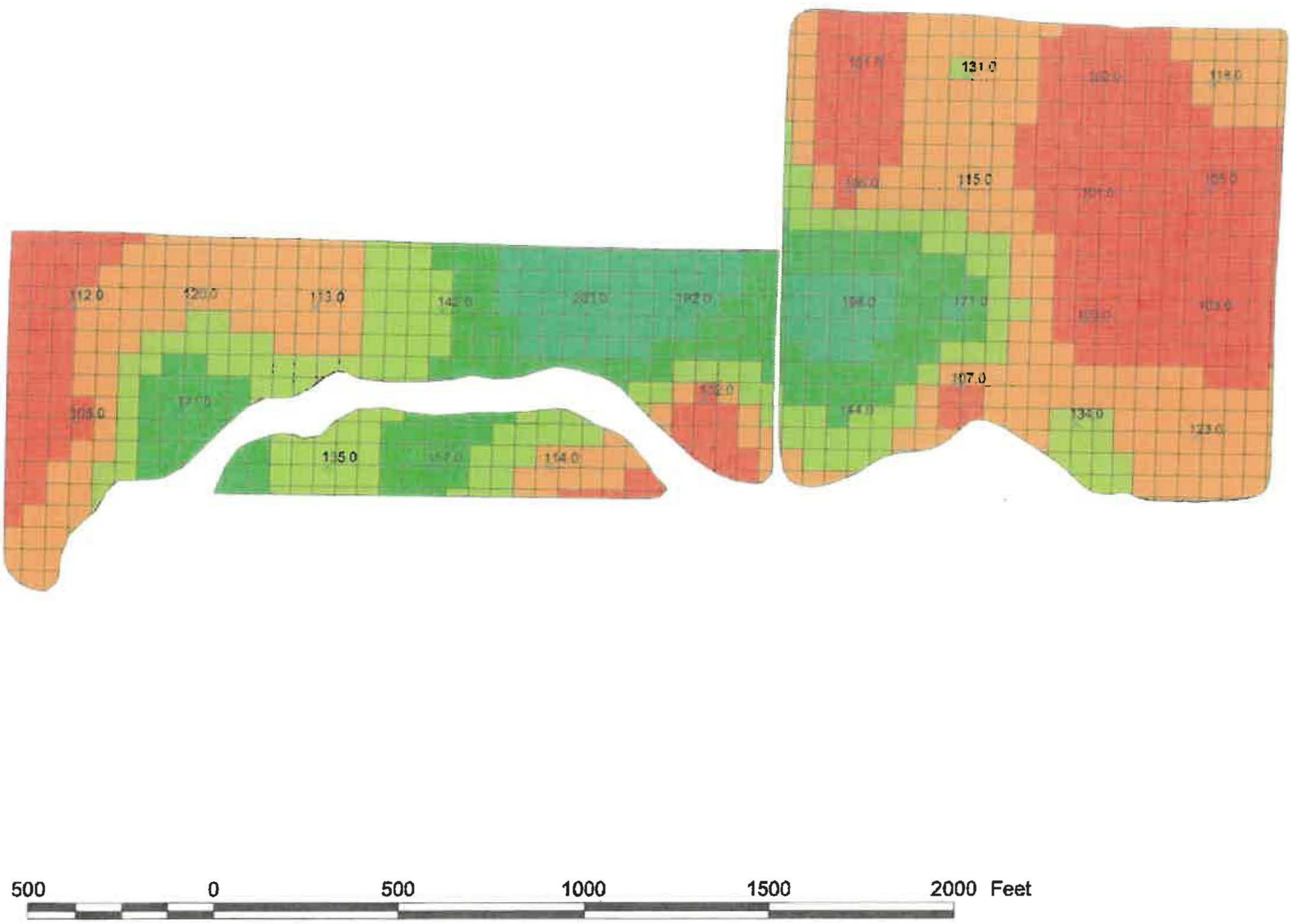
S-33

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6.2	2.3	42	128	2777	185	9.5	17.1	73.1	8.1	1.7								
2	5.9	2.4	67	197	3009	234	11.2	21.8	67.2	8.7	2.3								
3	6.4	2.3	18	144	2423	164	7.9	12.4	76.7	8.6	2.3								
4	6.4	2.2	19	188	2809	185	9.1	11.7	77.2	8.5	2.6								
5	6.7	2.2	22	152	2606	171	7.9	6.0	82.5	9.0	2.5								
6	6	2.1	28	110	2067	116	7.2	19.5	71.8	6.7	2.0								
7	6.3	2.4	39	160	2858	131	9.2	14.2	77.7	5.9	2.2								
8	6.5	2.1	29	108	2918	132	8.9	10.2	82.0	6.2	1.6								
9	6.2	2.3	50	137	2643	207	9.2	16.9	71.8	9.4	1.9								
10	6	2.3	43	152	2561	204	9.3	20.0	68.8	9.1	2.1								
11	6	2.7	40	142	2384	188	8.7	20.4	68.5	9.0	2.1								
12	5.7	2.2	18	104	2418	169	9.3	26.0	65.0	7.6	1.4								
13	6.1	2.3	66	164	2885	230	10.2	17.8	70.7	9.4	2.1								
14	6.1	2	19	111	2763	168	9.5	18.4	72.7	7.4	1.5								
AVERAGE	6.2	2.3	36	143	2652	177	9.1	16.6	73.3	8.1	2.0								

burgner; 23 (68.36 ac.) - Clipped K Surface: K

S-34



Sample Pts
Clipped K Surface: K

- 100.4 - 113.2 (20.1 ac.)
- 113.2 - 126.9 (21.2 ac.)
- 126.9 - 144.4 (11.5 ac.)
- 144.4 - 167.2 (10.1 ac.)
- 167.2 - 201.8 (5.4 ac.)
- (68.4ac.)Field Boundary

Date: Mar 20, 2023
Field Name: burgner; 23
Location: Wayne Co., Illinois, U.S.
Section 30, T2N, R9E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 68.36
Field Boundary Start Location:
Latitude: 38.57384765
Longitude: -88.25714857
No. of Observations: 976
Minimum K: 100.4
Maximum K: 201.7
Average K: 129.1

BLACKLOG AG SERVICES

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1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

DATE: 3/20/23

FARM/FIELD ID : BURGNER

S-34

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

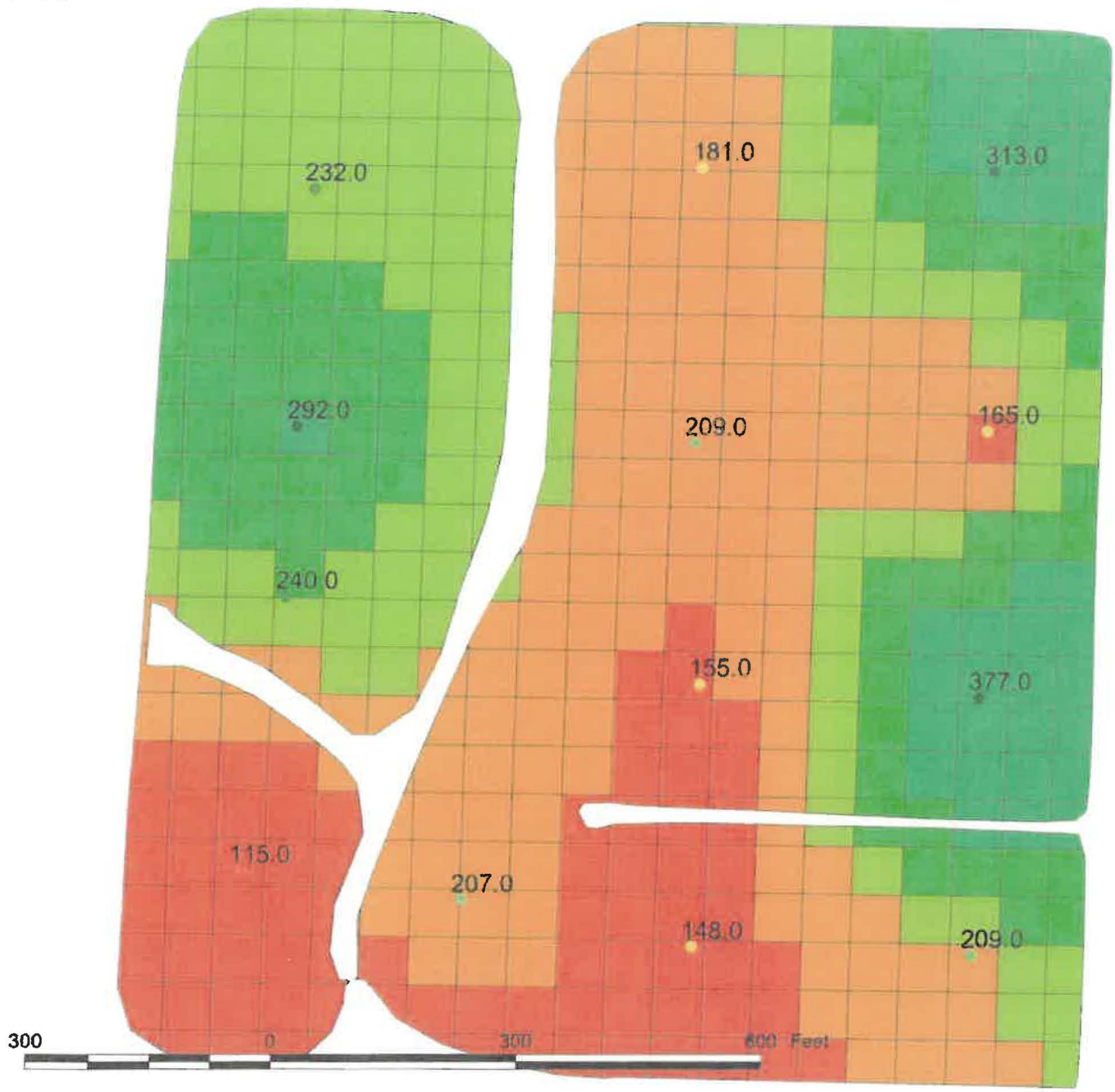
GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6.6	1.7	48	112	2492	185	7.8	8.4	79.9	9.9	1.8								
2	6.5	1.9	60	120	2386	179	7.6	9.7	78.5	9.8	2.0								
3	6.7	2.1	106	113	2750	161	8.2	6.2	83.8	8.2	1.8								
4	6.3	2.2	129	142	2770	220	9.4	14.6	73.7	9.8	1.9								
5	6.4	2.5	85	203	2682	253	9.1	11.8	73.7	11.6	2.9								
6	6.9	2.1	94	192	3162	253	9.4	2.1	84.1	11.2	2.6								
7	6.8	2.1	49	102	2144	165	6.4	3.5	83.8	10.7	2.0								
8	6.9	1.9	128	171	2571	226	7.7	1.5	83.5	12.2	2.8								
9	6.8	2	31	108	2599	163	7.6	3.8	85.5	8.9	1.8								
10	6.6	2.7	78	135	3027	287	9.7	7.9	78.0	12.3	1.8								
11	6.5	2.6	62	157	3027	299	10.0	9.8	75.7	12.5	2.0								
12	6.4	2.3	18	114	2757	298	9.4	11.9	73.3	13.2	1.6								
13	6.1	2	82	144	2392	257	8.8	17.7	68.0	12.2	2.1								
14	6	2.5	96	198	2821	339	10.9	20.0	64.7	13.0	2.3								
15	5.2	2.4	49	106	1832	177	8.5	35.8	53.9	8.7	1.6								
16	6.5	2.2	90	101	2483	213	8.0	9.7	77.6	11.1	1.6								
17	6.8	2.3	118	131	2692	229	8.2	4.3	82.1	11.6	2.0								
18	6.4	2.3	88	115	2605	261	8.8	11.9	74.0	12.4	1.7								
19	6.8	2.6	116	171	3164	313	9.8	3.8	80.7	13.3	2.2								
20	5.9	2.3	65	107	2282	234	8.7	21.6	65.6	11.2	1.6								
21	5.6	2.5	92	134	2259	261	9.6	28.1	58.8	11.3	1.8								
22	5.2	2.5	46	103	1655	178	7.8	35.8	53.0	9.5	1.7								
23	5.4	1.9	67	101	1460	200	6.8	32.1	53.7	12.3	1.9								
24	5.5	1.8	45	102	1747	186	7.5	29.8	58.2	10.3	1.7								
25	5.8	1.9	29	118	1901	192	7.5	23.9	63.4	10.7	2.0								

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
26	5.7	2.3	68	105	2245	229	9.0	25.5	62.4	10.6	1.5								
27	5.7	2.5	69	103	2296	222	9.2	26.1	62.4	10.1	1.4								
28	5.5	2.4	119	123	2389	271	10.4	30.2	57.4	10.9	1.5								
	6.2	2.2	76	130	2450	230	8.6	16.0	71.1	11.1	1.9								

hohlbaugh 39; 23 (32.77 ac.) - Sample Pts - K

S-35



Date: Mar 15, 2023
Field Name: hohlbaugh 39; 23
Location: Wayne Co., Illinois, U.S.
Section 11, T1N, R8E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 32.77
Field Boundary Start Location:
Latitude: 38.53685363
Longitude: -88.27885456
No. of Observations: 13
Minimum K: 115.0
Maximum K: 377.0
Average K: 218.7

Sample Pts - K
- 115.0
- 115.0 - 181.0
- 181.0 - 209.0
- 209.0 - 240.0
- 240.0 - 377.0

Clipped K Surface
- 119.0 - 175.5
- 175.5 - 212.4
- 212.4 - 243.9
- 243.9 - 282.9
- 282.9 - 361.7
- (32.8ac.)Field Boundary

BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

DATE: 3/15/23

FARM/FIELD ID: HOHLBAUGH 39

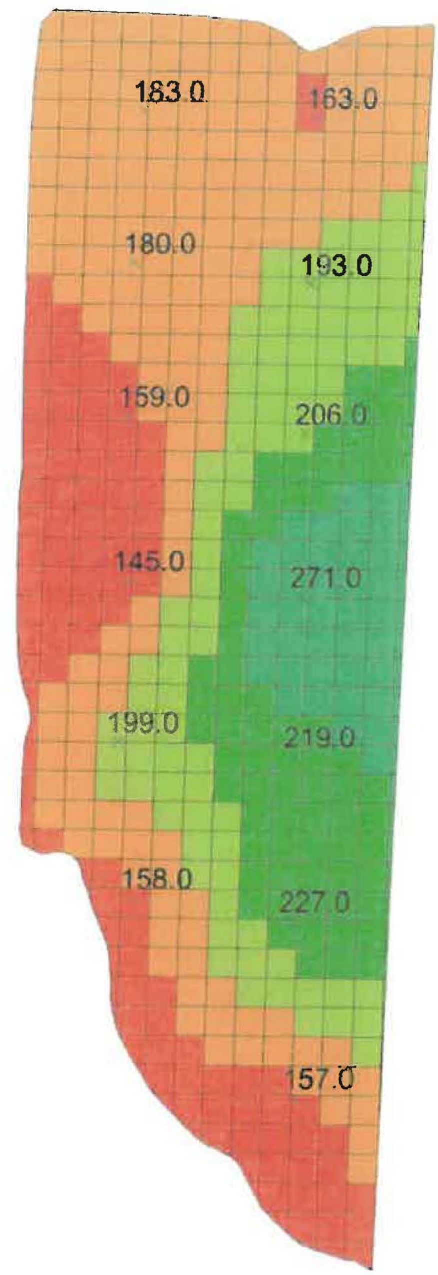
5-35

GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P lbs./A	K lbs./A	Ca lbs./A	Mg lbs./A	CEC	Percent Saturation H	Ca	Mg	K	S lbs./A	Zn lbs./A	Fe lbs./A	Mn lbs./A	Cu lbs./A	B lbs./A	Na lbs./A	
1	5.8	2.1	43	209	2604	106	9.5	24.1	68.5	4.6	2.8								
2	5.4	2.5	25	377	2342	113	10.1	32.5	58.0	4.7	4.8								
3	6.4	2.4	19	165	2992	201	9.7	12.1	77.1	8.6	2.2								
4	6.3	2.6	22	313	2714	148	9.1	14.2	74.6	6.8	4.4								
5	6.4	2.2	18	181	2272	101	7.2	12.1	78.9	5.8	3.2								
6	5.8	2.3	23	209	2179	125	8.2	23.9	66.4	6.4	3.3								
7	5.8	2.2	53	155	2408	105	8.8	24.3	68.4	5.0	2.3								
8	6.5	2.3	32	148	2626	116	8.0	9.5	82.1	6.0	2.4								
9	5.2	1.7	21	207	1807	108	8.1	35.3	55.8	5.6	3.3								
10	5.3	2	30	115	1723	119	7.5	34.0	57.4	6.6	2.0								
11	5.8	2.3	18	240	2486	162	9.5	24.3	65.4	7.1	3.2								
12	5.9	2.2	21	292	2117	183	8.2	21.6	64.5	9.3	4.6								
13	5.6	1.9	33	232	2202	159	9.0	28.1	61.2	7.4	3.3								
AVERAGE	5.9	2.2	28	219	2344	134	8.7	22.8	67.6	6.5	3.2								

West Williams; 23 (39.34 ac.) - Clipped K Surface: K

S-36



Date: Mar 15, 2023
Field Name: West Williams; 23
Location: Wayne Co., Illinois, U.S.
Section 25, T2N, R8E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 39.34
Field Boundary Start Location:
Latitude: 38.57737134
Longitude: -88.26182091
No. of Observations: 533
Minimum K: 145.6
Maximum K: 263.8
Average K: 188.2

Sample Pts
Clipped K Surface: K
145.0 - 164.9 (7.9 ac.)
164.9 - 185.4 (14.9 ac.)
185.4 - 208.0 (7.2 ac.)
208.0 - 232.7 (6.0 ac.)
232.7 - 263.9 (3.4 ac.)
(39.3ac.)Field Boundary

BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

DATE: 3/15/23

GROWER: MARK STEVE SHAN FARMS

FARM/FIELD ID: WEST WILLIAMS

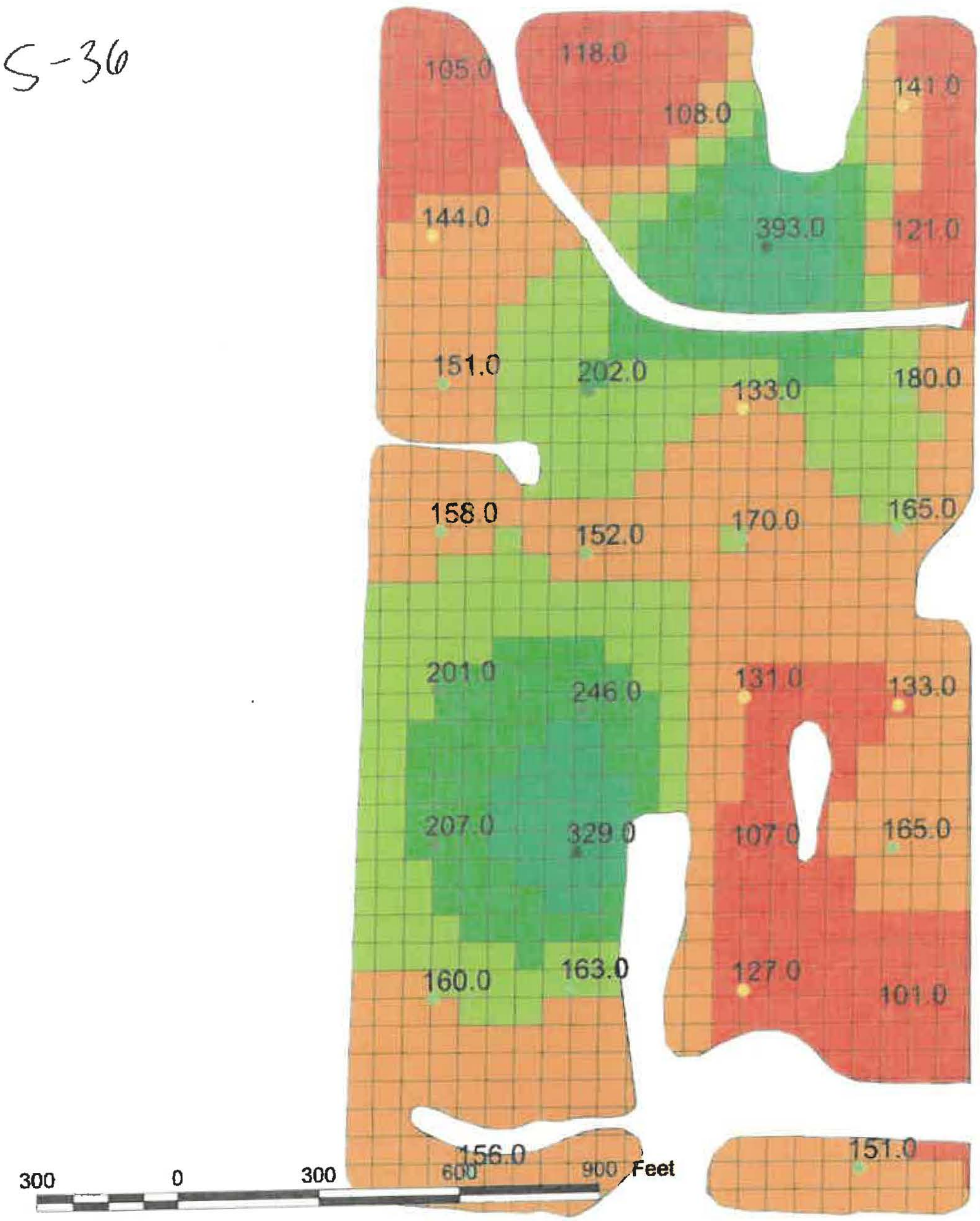
S-36

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	5.9	2.5	65	183	2970	172	10.7	21.7	69.4	6.7	2.2								
2	6.1	2.5	53	180	2518	164	8.8	18.1	71.5	7.8	2.6								
3	5.8	2.5	55	159	2174	126	8.1	23.9	67.1	6.5	2.5								
4	6.4	2.5	50	145	2918	186	9.4	12.2	77.6	8.2	2.0								
5	7.1	2.4	61	199	3434	403	10.5	0.0	81.8	16.0	2.4								
6	5.8	2.4	62	158	2509	295	10.2	24.4	61.5	12.1	2.0								
7	6.4	2.4	52	157	3034	282	10.2	12.1	74.4	11.5	2.0								
8	6.5	2.8	51	227	3470	456	12.1	10.2	71.7	15.7	2.4								
9	6	2.9	61	219	3382	264	12.3	20.1	68.7	8.9	2.3								
10	6.1	2.9	53	271	3182	214	11.2	17.9	71.0	8.0	3.1								
11	6.8	2.8	42	206	3549	185	10.3	3.8	86.1	7.5	2.6								
12	7.1	2.7	44	193	4064	200	11.2	0.0	90.7	7.4	2.2								
13	7.3	2.4	51	163	3524	170	9.7	0.0	90.8	7.3	2.2								
AVERAGE	6.4	2.6	54	189	3133	240	10.4	12.6	75.6	9.5	2.3								

neal home 80; 23 (67.13 ac.) - Sample Pts - K

S-36



Sample Pts - K
- 101.0 - 121.0
- 121.0 - 144.0
- 144.0 - 180.0
- 180.0 - 246.0
- 246.0 - 393.0

Clipped K Surface
- 99.0 - 136.6
- 136.6 - 165.7
- 165.7 - 199.9
- 199.9 - 250.8
- 250.8 - 367.5
- (67.1ac.)Field Boundary

Date: Mar 15, 2023
Field Name: neal home 80; 23
Location: Wayne Co., Illinois, U.S.
Section 25, T2N, R8E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 67.13
Field Boundary Start Location:
Latitude: 38.57094072
Longitude: -88.25724911
No. of Observations: 29
Minimum K: 101.0
Maximum K: 393.0
Average K: 166.1

BLACKLOG AG SERVICES

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1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

CLIENT:

DATE: **3/15/23**

FARM/FIELD ID : NEIL HOME 80

ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

S-36

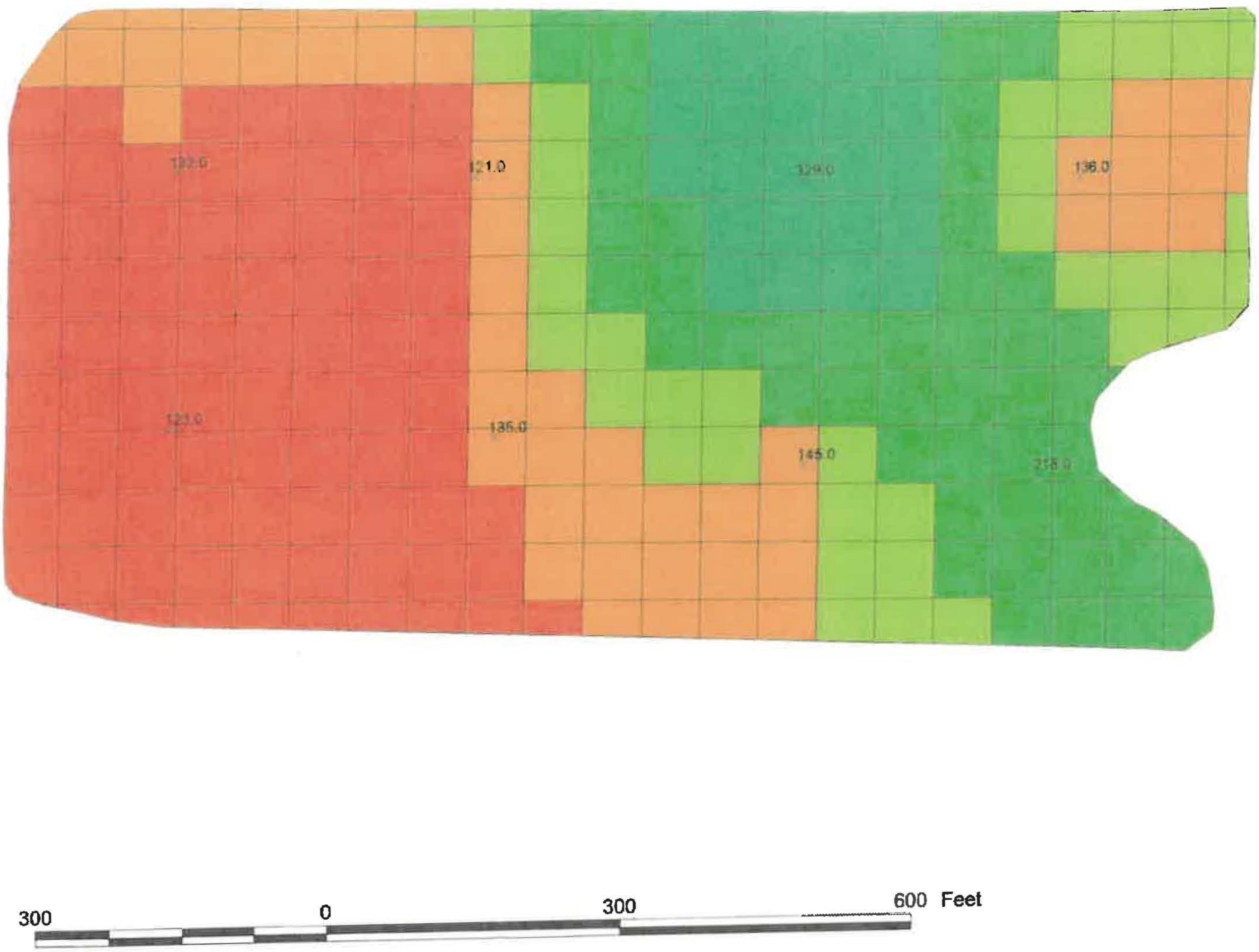
GROWER: MARK STEVE SHAN FARMS

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
1	6.6	2.2	33	105	3175	207	9.7	7.9	81.8	8.9	1.4								
2	6.5	2.4	33	144	2736	173	8.6	10.0	79.5	8.4	2.1								
3	6.1	2.8	31	151	2796	250	10.0	17.8	69.9	10.4	1.9								
4	6.3	2.6	50	158	2820	205	9.5	14.7	74.2	9.0	2.1								
5	6.3	2.7	41	201	3396	267	11.5	14.3	73.8	9.7	2.2								
6	6.5	2.9	48	207	3026	251	9.9	10.3	76.4	10.6	2.7								
7	6.3	2	21	160	2649	220	9.1	14.8	72.8	10.1	2.3								
8	5.9	2.2	60	156	2650	255	10.1	21.9	65.6	10.5	2.0								
9	6.2	2.1	21	163	2789	270	10.0	16.9	69.7	11.3	2.1								
10	7.1	2.3	89	329	4045	222	11.5	0.0	87.9	8.0	3.7								
11	6.5	3	35	246	3220	224	10.3	9.6	78.2	9.1	3.1								
12	7.1	2.5	63	152	3646	221	10.2	0.0	89.4	9.0	1.9								
13	6.8	2.9	62	202	3447	198	10.1	3.9	85.3	8.2	2.6								
14	7.1	2.5	128	133	3359	217	9.5	0.0	88.4	9.5	1.8								
15	5.8	2.7	31	170	2700	260	10.6	24.0	63.7	10.2	2.1								
16	6.4	2.3	61	131	3301	298	11.0	12.2	75.0	11.3	1.5								
17	6.4	2.1	124	107	3169	250	10.3	11.7	76.9	10.1	1.3								
18	6.8	2.7	218	127	4094	307	12.1	3.5	84.6	10.6	1.3								
19	6.1	2.5	85	101	3401	265	11.9	18.2	71.4	9.3	1.1								
20	6.9	2.6	132	165	3664	335	11.0	2.1	83.3	12.7	1.9								
21	7	2.5	49	133	3518	288	10.2	0.0	86.2	11.8	1.7								
22	5.7	2.5	158	165	3235	248	12.6	25.9	64.2	8.2	1.7								
23	6.5	2.4	77	180	3559	262	11.3	9.6	78.7	9.7	2.0								
24	6.3	2.7	52	121	3144	223	10.5	14.8	74.9	8.8	1.5								
25	7	2.4	46	141	3639	216	10.2	0.0	89.2	8.8	1.8								

Sample ID	WpH	OM	P	K	Ca	Mg	CEC	Percent Saturation				S	Zn	Fe	Mn	Cu	B	Na	
			lbs./A	lbs./A	lbs./A	lbs./A		H	Ca	Mg	K	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	lbs./A	
26	5.6	2.8	167	393	2436	302	10.9	28.0	55.9	11.5	4.6								
27	6.2	2.3	78	108	2601	374	9.8	16.3	66.4	15.9	1.4								
28	6.2	1.8	68	118	2199	184	7.7	16.6	71.4	10.0	2.0								
29	5.3	2.5	101	151	2310	171	10.2	34.5	56.6	7.0	1.9								
	6.4	2.5	75	166	3128	247	10.4	12.4	75.6	10.0	2.1								

Berger 20; 23 (18.28 ac.) - Clipped K Surface: K

S-36



Date: Mar 15, 2023
Field Name: Berger 20; 23
Location: Wayne Co., Illinois, U.S.
Section 24, T2N, R8E
Farm Name: Mark Steve Shan Farms Inc
Client Name: Shan Farms
Total Acres: 18.28
Field Boundary Start Location:
Latitude: 38.59592087
Longitude: -88.27168251
No. of Observations: 257
Minimum K: 120.5
Maximum K: 320.7
Average K: 165.2

Sample Pts
Clipped K Surface: K
120.5 - 133.3 (6.3 ac.)
133.3 - 152.4 (3.5 ac.)
152.4 - 181.0 (2.8 ac.)
181.0 - 230.2 (3.7 ac.)
230.2 - 320.8 (2.0 ac.)
(18.3ac.)Field Boundary

BLACKLOG AG SERVICES

1503 East Co Hwy 26
Lakewood, IL 62438
Phone: (217) 774-4838

DATE: 3/15/23

FARM/FIELD ID: BERGER 20
5-36

GROWER: MARK STEVE SHAN FARMS

CLIENT:
ICS CONSULTING
2656 COUNTY HWY 2
MT ERIE, IL 62446

Sample ID	WpH	OM	P lbs./A	K lbs./A	Ca lbs./A	Mg lbs./A	CEC	Percent Saturation H	Ca	Mg	K	S lbs./A	Zn lbs./A	Fe lbs./A	Mn lbs./A	Cu lbs./A	B lbs./A	Na lbs./A	
1	6.2	2.7	97	218	2855	165	9.7	16.4	73.6	7.1	2.9								
2	5.6	2.7	22	145	2649	145	10.3	28.0	64.3	5.9	1.8								
3	5.9	2.5	21	135	2812	139	9.9	21.4	71.0	5.9	1.7								
4	6.2	2.2	46	123	2799	126	9.2	16.5	76.1	5.7	1.7								
5	5.7	2.7	48	132	2766	203	10.7	25.9	64.6	7.9	1.6								
6	5.7	2.4	26	121	2829	220	11.0	26.0	64.3	8.3	1.4								
7	5.7	2.8	38	329	3330	267	13.3	25.8	62.6	8.4	3.2								
8	5.7	2.5	25	136	2744	152	10.4	26.2	66.0	6.1	1.7								
AVERAGE	5.8	2.6	40	167	2848	177	10.6	23.3	67.8	6.9	2.0								

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KSI LABORATORIES

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PHONE (217) 774-2421
www.KSILab.com

OPERATOR: BRAD ATTEBERRY
FIELD: WEST WILLY
ACRES:

LAB#: 347222-26 (30453)
DATE: 11/16/2020
SUBMITTED BY: WABASH VALLEY FS (CISNE)

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER pH	PHOSPHORUS lbs/A	POTASSIUM lbs/A	CALCIUM lbs/A	MAGNESIUM lbs/A	ORGANIC MATTER %	CATION EXCHANGE CAPACITY	BASE SATURATION %Ca	%Mg	%K	%H
1	6.8	7.0	27	304	2793	137	2.6	8.3	84.2	6.9	4.7	4.2
2	6.6	7.0	25	396	2610	136	2.6	8.3	78.7	6.9	6.2	8.3
3	6.3	7.0	23	305	2482	120	2.5	8.3	74.8	6.1	4.8	14.4
4	6.9	7.0	25	259	3338	145	2.4	9.5	87.9	6.4	3.5	2.2
5	7.1	7.0	27	212	3173	144	2.5	8.8	90.2	6.9	3.1	-
AVERAGE	6.7	7.0	25	295	2879	136	2.5	8.6	83.1	6.6	4.5	7.2

PH AVE.	6.7	EXTRACTED SAMPLES:
P1 AVE.	25	EXTRACTED SAMPLES:
K AVE.	295	EXTRACTED SAMPLES:

Operator: - GAYER FARMS
Field: HOHLBAUGH HOME PLACE
Acres: 89.5

Lab #: 2362-03 (235)
Date: 02/20/2019
Submitted By: OPERATOR G

#37
+81

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	6.5	7.0	31	573	2929	393	2.5	10.8	67.9	15.2	6.9	10.1
2	5.9	6.9	27	450	2480	296	2.0	10.3	60.2	12.0	5.7	22.1
3	6.1	7.0	43	485	2537	304	2.3	10.0	63.5	12.7	6.3	17.5
4	6.1	7.0	29	308	2544	247	2.0	9.5	67.0	10.9	4.2	17.9
5	5.9	6.8	23	500	3277	293	2.4	12.9	63.6	9.5	5.0	21.9
6	6.0	6.9	26	548	2293	208	2.5	9.1	63.0	9.6	7.8	19.6
7	5.7	6.7	33	527	1727	228	2.0	8.0	54.0	11.9	8.5	25.6
8	6.2	7.0	92	551	2999	508	2.4	12.3	61.0	17.3	5.8	15.9
9	6.1	7.0	27	468	2172	261	2.5	8.7	62.5	12.6	6.9	18.0
10	6.1	7.0	70	435	2425	273	2.5	9.5	63.9	12.0	5.9	18.2
11	6.1	7.0	34	477	2163	170	2.4	8.2	66.0	8.7	7.5	17.8
12	6.4	7.0	53	389	2337	231	2.2	8.3	70.4	11.6	6.1	11.9
13	6.7	7.0	70	496	2366	290	2.5	8.3	71.3	14.6	7.7	6.4
14	6.3	7.0	32	481	2276	238	2.3	8.5	67.0	11.7	7.3	14.0
15	6.5	7.0	28	519	2134	239	2.0	7.8	68.4	12.8	8.6	10.2
16	6.3	7.0	24	482	2592	257	2.4	9.5	68.3	11.3	6.6	13.9
17	5.9	6.8	17	189	3430	329	2.4	13.1	65.5	10.5	1.9	22.1
18	5.5	6.4	22	128	1353	144	2.3	5.9	57.4	10.2	2.8	29.6
19	5.8	6.7	36	297	2098	192	2.4	8.5	61.8	9.5	4.5	24.3
20	6.7	7.0	37	426	2460	234	2.2	8.2	75.1	11.9	6.7	6.3
21	5.9	6.8	42	401	1892	193	2.3	7.8	60.7	10.4	6.6	22.3
22	5.7	6.6	33	412	2009	158	2.2	8.4	59.8	7.9	6.3	25.9
23	5.9	6.8	27	356	2117	167	2.4	8.3	63.8	8.4	5.5	22.2
24	6.4	7.0	43	454	2262	139	2.0	7.7	73.5	7.6	7.6	11.3
25	5.9	6.9	21	413	2595	194	2.0	10.0	64.9	8.1	5.3	21.6
26	6.3	7.0	24	414	2236	122	2.4	7.7	72.6	6.7	6.9	13.8
27	6.0	7.0	19	389	2419	159	2.0	9.0	67.2	7.4	5.6	19.8
28	6.1	7.0	35	377	2638	146	2.3	9.4	70.2	6.5	5.2	18.1
29	5.9	6.8	20	272	2192	105	2.2	8.0	68.6	5.5	4.4	21.5
30	6.7	7.0	22	411	2378	109	2.2	7.4	80.4	6.2	7.2	6.3
31	6.5	7.0	13	370	2536	151	2.3	8.3	76.4	7.6	5.8	10.2
32	6.3	7.0	15	303	1936	85	2.0	6.5	74.5	5.5	6.0	14.0
33	6.1	7.0	18	368	1901	98	2.4	6.9	68.9	6.0	6.9	18.2
34	6.2	7.0	21	367	1995	104	1.8	7.0	71.3	6.2	6.8	15.7
35	6.5	7.0	18	372	2558	146	2.2	8.3	77.1	7.4	5.8	9.7
36	6.4	7.0	18	403	2595	120	2.2	8.5	76.4	5.9	6.1	11.6
37	6.6	7.0	21	384	2730	118	2.0	8.5	80.3	5.8	5.8	8.0
38	6.4	7.0	17	400	2497	116	1.8	8.2	76.2	5.9	6.3	11.6
39	6.7	7.0	25	408	2626	107	1.8	8.0	82.1	5.6	6.6	5.7
40	6.2	7.0	31	337	2257	85	2.0	7.7	73.3	4.6	5.7	16.4
41	6.4	7.0	31	380	2520	114	2.4	8.3	76.0	5.8	5.9	12.4
42	6.3	7.0	34	320	2715	253	1.7	9.6	70.8	11.0	4.3	13.9

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Operator: - GAYER FARMS
Field: HOHLBAUGH HOME PLACE
Acres: 89.5

Lab #: 2362-03 (235)
Date: 02/20/2019
Submitted By: OPERATOR G

SOIL TEST RESULTS

SOIL BUFFER P1 K Ca Mg OM CEC Base Saturation
SAMPLE# pH Ph Lbs/a Lbs/a Lbs/a Lbs/a % meg %Ca %Mg %K %H

235

AVERAGE	6.2	6.9	31	406	2386	198	2.2	8.7	68.6	9.3	6.1	16.0

PH AVE. 6.2 EXTRACTED SAMPLES:18,
P1 AVE. 27 EXTRACTED SAMPLES: 8,10,13,
K AVE. 414 EXTRACTED SAMPLES: 1,17,18,

B22A

Operator: - GAYER FARMS
Field: HOG BARNS 5
Acres: 18.5

Lab #: 2526-33 (241)
Date: 02/20/2019
Submitted By: OPERATOR G

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	5.7	6.6	28	637	1133	91	2.3	5.4	52.5	7.1	15.2	25.3
2	6.3	7.0	25	574	1706	111	2.2	6.4	66.7	7.3	11.5	14.5
3	5.8	6.9	31	645	1686	112	1.8	7.2	58.6	6.5	11.5	23.3
4	6.4	7.0	50	579	2283	213	2.4	8.3	68.8	10.7	9.0	11.4
5	5.9	6.9	26	561	1657	112	2.0	6.8	61.0	6.9	10.6	21.5
6	6.2	7.0	26	658	1654	114	2.0	6.5	63.7	7.4	13.0	15.9
7	6.0	6.9	36	569	1847	136	2.4	7.4	62.4	7.7	9.9	19.9
8	5.9	7.0	31	514	1965	261	1.8	8.5	57.8	12.8	7.8	21.5
AVERAGE	6.0	6.9	32	592	1741	144	2.1	7.1	61.4	8.3	11.1	19.2

PH AVE. 6.0 EXTRACTED SAMPLES:
P1 AVE. 32 EXTRACTED SAMPLES:
K AVE. 592 EXTRACTED SAMPLES:

https://www.youtube.com/watch?v=g6STLUbo5Po Operator: - GAYER FARMS
Lab #: 2534-66 (242)
Field: HOG BARNS 6 B3 Date: 02/20/2019
Acres: 75.1 Submitted By: OPERATOR G

SOIL TEST RESULTS
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SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	5.9	6.8	36	746	1674	174	2.4	7.5	55.9	9.7	12.8	21.6
2	5.8	6.8	36	668	1459	136	2.0	6.7	54.5	8.5	12.8	24.2
3	5.9	6.8	24	491	1928	172	2.5	7.9	61.1	9.1	8.0	21.8
4	5.5	6.5	20	711	2527	280	2.0	12.0	52.7	9.8	7.6	29.9
5	5.8	6.7	37	687	1875	126	2.4	8.0	58.6	6.6	11.1	23.7
6	6.3	7.0	43	878	2226	196	2.5	8.7	64.0	9.4	13.0	13.6
7	6.4	7.0	42	674	2882	291	2.3	10.5	68.7	11.6	8.3	11.5
8	7.4	7.0	148	763	4769	378	2.2	14.5	82.3	10.9	6.8	0.0
9	6.6	7.0	68	834	3074	280	2.4	10.8	71.2	10.9	10.0	8.0
10	5.7	6.7	29	867	2746	303	2.0	12.5	55.0	10.2	8.9	25.9
11	6.2	7.0	36	714	1793	139	2.6	7.1	63.2	8.2	12.9	15.7
12	5.4	6.4	40	573	1258	155	2.0	6.7	47.0	9.7	11.0	32.3
13	6.0	6.9	36	593	2042	240	2.4	8.6	59.4	11.7	8.9	20.0
14	6.5	7.0	34	738	2158	132	2.5	7.7	70.1	7.2	12.3	10.4
15	6.2	7.0	41	607	1907	119	2.3	7.2	66.3	6.9	10.9	15.9
16	6.6	7.0	32	752	2181	157	2.4	7.7	70.9	8.5	12.6	8.0
17	6.2	7.0	35	651	2020	157	2.2	7.8	64.8	8.4	10.8	16.0
18	6.3	7.0	48	823	2073	173	2.3	8.1	64.0	8.9	13.1	13.9
19	5.9	6.8	46	778	1777	129	2.5	7.7	57.7	7.0	13.0	22.2
20	6.2	7.0	38	657	2018	127	2.2	7.6	66.4	7.0	11.1	15.4
21	6.4	7.0	31	626	2250	141	2.4	8.0	70.4	7.4	10.1	12.2
22	7.0	7.0	65	504	3177	330	2.0	10.0	79.5	13.8	6.5	0.2
23	5.4	6.2	39	87	2034	274	2.8	9.3	54.7	12.3	1.2	31.7
24	5.5	6.4	35	658	1907	230	2.4	9.4	50.8	10.2	9.0	30.0
25	5.7	6.7	42	642	1358	138	2.0	6.5	52.3	8.9	12.7	26.1
26	6.0	6.9	41	669	1783	178	2.5	7.6	58.7	9.8	11.3	20.2
27	6.1	7.0	29	665	2011	245	2.5	8.4	59.9	12.2	10.2	17.7
28	6.1	7.0	32	737	2349	271	2.2	9.7	60.6	11.7	9.8	17.9
29	5.4	6.3	35	539	1961	221	2.3	9.6	51.1	9.6	7.2	32.0
30	5.7	6.6	24	471	1764	201	2.2	7.9	55.9	10.7	7.7	25.8
31	5.7	6.6	27	402	2172	288	2.2	9.7	56.0	12.4	5.4	26.2
32	5.6	6.6	31	443	1820	187	2.0	8.2	55.5	9.6	7.0	27.9
33	5.7	6.6	32	469	1714	147	2.4	7.4	58.0	8.3	8.2	25.5
AVERAGE	6.0	6.8	40	640	2142	204	2.3	8.7	61.1	9.6	9.8	19.5

PH AVE. 6.0 EXTRACTED SAMPLES: 8,22,
P1 AVE. 37 EXTRACTED SAMPLES: 8,
K AVE. 675 EXTRACTED SAMPLES: 3, 6, 9,10,18,22,23,30,31,32,33,

Operator: - GAYER FARMS B4
Field: HOG BARNS 7
Acres: 16.4

Lab #: 2568-74 (244)
Date: 02/20/2019
Submitted By: OPERATOR G

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	5.6	6.5	42	387	1655	123	2.5	7.1	58.3	7.3	7.0	27.4
2	5.7	6.6	23	531	1472	186	2.3	6.9	53.4	11.3	9.9	25.4
3	5.4	6.2	26	510	1729	173	2.6	8.4	51.5	8.6	7.8	32.0
4	6.3	7.0	22	601	1806	323	1.8	7.7	58.7	17.5	10.1	13.7
5	6.8	7.0	25	564	1985	238	1.8	7.0	70.9	14.2	10.4	4.5
6	6.0	7.0	34	509	1694	126	2.0	6.8	62.3	7.8	9.6	20.3
7	5.9	6.8	22	424	1588	200	2.2	6.9	57.6	12.1	7.9	22.4
AVERAGE	6.0	6.7	28	504	1704	196	2.2	7.3	59.0	11.3	9.0	20.8

PH AVE. 5.8 EXTRACTED SAMPLES: 5,
P1 AVE. 28 EXTRACTED SAMPLES:
K AVE. 504 EXTRACTED SAMPLES:

Operator: - GAYER FARMS B-5
Field: HOG BARNS 8
Acres: 47.7

Lab #: 2575-92 (245)
Date: 02/20/2019
Submitted By: OPERATOR G

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	6.7	7.0	32	398	2992	206	2.0	9.4	79.6	9.2	5.5	5.7
2	6.5	7.0	18	386	2981	682	1.7	12.0	62.2	23.7	4.2	9.9
3	7.5	7.0	52	385	3682	172	2.4	10.4	88.6	6.9	4.8	-
4	7.1	7.0	58	515	2876	283	2.3	9.0	79.9	13.2	7.4	-
5	6.9	7.0	31	450	2296	242	2.2	7.5	76.6	13.5	7.7	2.2
6	6.3	7.0	41	478	2251	329	2.2	8.9	63.3	15.5	6.9	14.3
7	5.0	6.1	72	535	1621	287	1.8	9.9	41.0	12.1	7.0	39.9
8	6.7	7.0	29	430	2479	199	2.2	8.1	76.6	10.3	6.9	6.3
9	7.1	7.0	57	436	2516	328	1.8	8.2	76.8	16.7	6.9	-
10	7.3	7.0	54	329	2873	280	2.2	8.8	81.7	13.3	4.8	0.2
11	6.4	7.0	99	391	3258	513	2.0	12.3	66.3	17.4	4.1	12.2
12	6.9	7.0	61	515	2684	205	2.4	8.4	79.9	10.2	7.9	1.9
13	6.6	7.0	63	690	2151	134	2.5	7.4	72.7	7.6	12.0	7.7
14	5.8	6.7	40	533	1733	155	2.3	7.4	58.6	8.8	9.3	23.3
15	5.9	6.8	25	492	1664	160	2.4	7.0	59.5	9.6	9.1	21.9
16	6.2	7.0	48	609	1622	129	2.5	6.4	63.4	8.4	12.2	15.9
17	7.5	7.0	30	358	2650	271	2.0	8.2	80.8	13.8	5.6	-
18	6.8	7.0	67	306	3015	234	2.3	9.3	81.1	10.5	4.3	4.1
AVERAGE	6.6	6.9	49	458	2519	267	2.2	8.8	71.6	12.3	7.0	11.8

PH AVE. 6.7 EXTRACTED SAMPLES: 3, 7,10,14,15,17,
P1 AVE. 46 EXTRACTED SAMPLES:11,
K AVE. 434 EXTRACTED SAMPLES:13,16,

Operator: - GAYER FARMS
Field: HOG BARNS 9 B21
Acres: 27.5

Lab #: 2593-04 (246)
Date: 02/20/2019
Submitted By: OPERATOR G

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	6.6	7.0	55	458	2521	217	1.8	8.5	74.2	10.7	7.0	8.2
2	7.0	7.0	64	351	2905	245	2.4	8.7	83.5	11.8	5.2	-
3	6.6	7.0	37	361	3200	249	2.0	10.3	77.7	10.1	4.5	7.6
4	6.8	7.0	33	311	2263	193	1.8	7.1	79.7	11.4	5.7	3.2
5	6.8	7.0	50	540	2496	167	2.2	7.9	79.0	8.9	8.8	3.3
6	6.8	7.0	38	531	3071	340	2.2	10.2	75.3	13.9	6.7	4.0
7	7.1	7.0	44	442	2880	339	2.3	9.2	78.3	15.4	6.2	0.1
8	6.2	7.0	41	438	2670	280	2.2	10.0	66.8	11.7	5.7	15.8
9	6.8	7.0	99	463	2820	282	2.3	9.2	76.7	12.8	6.5	4.0
10	6.2	7.0	24	509	2104	147	2.5	7.8	67.5	7.9	8.4	16.2
11	6.4	7.0	21	400	2204	317	1.8	8.3	66.4	16.0	6.2	11.4
12	6.7	7.0	50	542	2287	165	2.2	7.6	75.3	9.1	9.2	6.4
AVERAGE	6.7	7.0	46	446	2618	245	2.1	8.7	75.0	11.6	6.7	7.3

PH AVE. 6.7 EXTRACTED SAMPLES:
P1 AVE. 42 EXTRACTED SAMPLES: 9,
K AVE. 446 EXTRACTED SAMPLES:

Operator: - GAYER FARMS
Field: HOG BARNS 1
Acres: 59.3

Lab #: 2404-27 (236)
Date: 02/20/2019
Submitted By: OPERATOR G

B11+B12

SOIL TEST RESULTS
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SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	5.6	6.5	240	489	1858	144	2.5	8.2	56.7	7.4	7.7	28.2
2	5.3	6.2	215	690	1904	184	2.3	9.7	49.1	8.0	9.2	33.8
3	5.9	6.8	183	711	1573	139	2.4	7.0	56.2	8.3	13.1	22.4
4	6.0	6.9	196	751	1897	182	2.3	8.1	58.6	9.4	11.9	20.1
5	5.9	6.8	66	685	1578	105	2.4	6.7	58.9	6.6	13.2	21.3
6	5.5	6.4	239	451	1642	185	2.5	7.8	52.7	9.9	7.5	29.9
7	6.0	6.9	181	690	2074	234	2.2	8.8	59.0	11.1	10.1	19.8
8	5.7	6.6	87	670	1917	165	2.4	8.6	55.8	8.0	10.0	26.1
9	6.5	7.0	160	656	2547	221	2.5	9.0	70.8	10.3	9.4	9.5
10	7.0	7.0	172	609	3725	276	2.4	11.2	83.2	10.3	7.0	-
11	6.3	7.0	95	488	2117	159	2.3	7.7	68.8	8.7	8.2	14.4
12	5.9	6.8	62	433	1976	144	2.5	7.8	63.4	7.7	7.2	21.7
13	6.1	7.0	121	608	1901	169	2.3	7.6	62.6	9.3	10.3	17.8
14	5.7	6.6	213	462	1721	227	2.4	7.9	54.5	12.0	7.5	25.9
15	6.1	7.0	118	592	2014	170	2.2	7.9	63.8	9.0	9.7	17.5
16	6.0	6.9	91	664	2415	233	2.4	9.8	61.7	10.0	8.7	19.6
17	6.3	7.0	112	584	1868	113	2.3	6.8	68.7	7.0	11.1	13.2
18	6.3	7.0	76	437	2273	172	2.0	8.1	70.2	8.9	7.0	13.9
19	7.0	7.0	100	709	2688	207	2.4	8.5	79.1	10.2	10.7	-
20	6.2	7.0	76	729	2279	190	2.2	8.8	64.8	9.0	10.7	15.5
21	6.1	7.0	188	560	1940	176	2.3	7.7	63.0	9.6	9.4	18.0
22	6.2	7.0	178	671	2088	190	2.5	8.2	63.7	9.7	10.5	16.0
23	6.1	7.0	177	559	2037	185	2.4	8.0	63.7	9.7	9.0	17.6
24	6.2	7.0	266	589	1915	206	2.3	7.6	63.0	11.3	10.0	15.6
AVERAGE	6.1	6.9	151	604	2081	182	2.4	8.2	63.0	9.2	9.5	19.9

PH AVE. 6.0 EXTRACTED SAMPLES: 2,10,19,
P1 AVE. 173 EXTRACTED SAMPLES: 1, 2, 5, 6, 8,11,12,14,15,16,17,18,19,20,24,
K AVE. 627 EXTRACTED SAMPLES: 6,12,18,

Operator: - GAYER FARMS
Field: HOG BARNS 2
Acres: 40.6

Lab #: 2428-46 (237)
Date: 02/20/2019
Submitted By: OPERATOR G

SOIL TEST RESULTS

BIO

SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	5.8	6.7	190	647	1974	243	2.5	8.9	55.5	11.4	9.4	23.7
2	5.2	6.1	81	599	964	103	2.4	5.6	43.1	7.7	13.8	35.4
3	5.3	6.2	99	525	1455	161	2.5	7.5	48.6	9.0	9.0	33.4
4	6.0	6.9	65	553	1996	132	2.2	7.8	64.0	7.1	9.1	19.7
5	5.8	6.7	64	633	1485	113	2.2	6.6	56.3	7.2	12.3	24.2
6	5.8	6.7	78	698	1616	159	2.4	7.4	54.6	9.0	12.1	24.2
7	5.8	6.6	93	721	1556	149	2.6	7.2	54.1	8.7	12.9	24.4
8	5.5	6.4	86	762	1681	151	2.5	8.3	50.7	7.6	11.8	29.9
9	5.8	6.7	67	637	1440	126	2.3	6.5	55.4	8.1	12.6	23.8
10	6.2	7.0	60	792	2032	144	2.4	8.0	63.6	7.6	12.7	16.2
11	6.0	7.0	72	709	2001	146	2.0	8.1	61.8	7.6	11.3	19.4
12	7.0	7.0	49	536	2835	194	2.4	8.6	82.5	9.4	8.0	0.0
13	6.3	7.0	59	845	2437	186	2.3	9.2	66.3	8.5	11.8	13.4
14	6.0	6.9	68	716	1718	135	2.2	7.2	59.7	7.9	12.8	19.6
15	5.5	6.6	20	353	1855	174	1.8	8.3	55.9	8.8	5.5	29.8
16	5.6	6.5	25	272	2097	148	2.5	8.6	61.0	7.2	4.1	27.7
17	5.6	6.5	34	327	1695	168	2.4	7.4	57.3	9.5	5.7	27.5
18	6.3	7.0	17	74	3273	158	2.5	10.4	78.7	6.4	1.0	13.9
19	6.5	7.0	16	64	2973	124	2.3	8.9	83.6	5.9	1.0	9.6
AVERAGE	5.9	6.7	65	551	1952	153	2.3	7.9	60.7	8.1	9.3	21.9

PH AVE. 5.8 EXTRACTED SAMPLES: 2,12,19,
P1 AVE. 70 EXTRACTED SAMPLES: 1,15,16,18,19,
K AVE. 645 EXTRACTED SAMPLES:10,13,15,16,17,18,19,

Operator: - GAYER FARMS
Field: HOG BARNS 4
Acres: 18.7

Lab #: 2517-25 (240)
Date: 02/20/2019
Submitted By: OPERATOR G

B2

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	6.1	7.0	39	638	2064	189	2.4	8.3	62.2	9.5	9.9	18.3
2	5.9	6.9	38	656	1500	120	2.0	6.5	57.7	7.7	13.0	21.5
3	6.1	7.0	39	784	1748	158	2.4	7.4	59.1	8.9	13.6	18.3
4	5.7	6.6	34	642	1267	109	2.3	6.0	52.8	7.6	13.8	25.8
5	5.9	6.9	33	645	1619	152	2.0	7.1	57.1	9.0	11.7	22.3
6	5.6	6.5	28	578	1534	157	2.2	7.3	52.6	9.0	10.2	28.2
7	5.9	7.0	27	600	1857	230	1.8	8.2	56.7	11.7	9.4	22.2
8	6.2	7.0	28	720	2677	305	2.5	10.6	63.2	12.0	8.8	16.0
9	5.7	6.7	25	507	1769	214	2.0	8.1	54.6	11.1	8.1	26.2
AVERAGE	5.9	6.8	32	641	1782	182	2.2	7.7	57.3	9.6	10.9	22.1

PH AVE. 5.9 EXTRACTED SAMPLES:
P1 AVE. 32 EXTRACTED SAMPLES:
K AVE. 641 EXTRACTED SAMPLES:

Operator: - GAYER FARMS
Field: HOG BARNS 3
Acres: 175.4

Lab #: 2447-15 (238)
Date: 02/20/2019
Submitted By: OPERATOR G
B6, B7, B8, B9

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER Ph	P1 Lbs/a	K Lbs/a	Ca Lbs/a	Mg Lbs/a	OM %	CEC meg	Base Saturation %Ca	%Mg	%K	%H
1	6.2	7.0	36	563	2051	188	2.5	7.9	65.0	10.0	9.2	15.9
2	5.9	6.8	39	588	2145	240	2.2	9.1	59.0	11.0	8.3	21.6
3	5.6	6.5	34	528	1835	233	2.5	8.7	52.8	11.2	7.8	28.2
4	6.1	7.0	28	716	2183	230	2.3	8.9	61.4	10.8	10.4	17.4
5	6.3	7.0	56	864	2381	284	2.4	9.6	62.1	12.4	11.6	14.0
6	6.5	7.0	83	892	2428	275	2.4	9.3	65.3	12.4	12.3	10.0
7	6.2	7.0	46	811	2751	359	2.2	11.2	61.5	13.4	9.3	15.8
8	6.5	7.0	56	704	2526	318	2.5	9.5	66.5	14.0	9.6	9.9
9	6.7	7.0	152	897	2520	323	2.3	9.4	67.1	14.4	12.3	6.3
10	6.3	7.0	56	767	2242	332	2.0	9.3	60.3	14.9	10.6	14.1
11	6.5	7.0	235	664	2088	306	1.8	8.2	63.7	15.6	10.4	10.3
12	6.5	7.0	173	781	2419	267	2.5	9.1	66.5	12.3	11.1	10.2
13	6.5	7.0	85	725	2088	244	2.3	8.0	65.3	12.8	11.7	10.3
14	6.7	7.0	79	933	2721	297	2.4	9.8	69.5	12.7	12.3	5.6
15	6.2	7.0	87	764	1935	250	2.4	8.2	59.0	12.8	12.0	16.2
16	6.8	7.0	89	869	2245	216	2.3	7.9	71.1	11.4	14.2	3.3
17	6.6	7.0	57	882	2284	184	2.0	8.3	68.8	9.3	13.7	8.2
18	6.4	7.0	38	715	2055	180	2.4	7.7	66.8	9.8	12.0	11.5
19	6.3	7.0	42	788	2149	195	2.2	8.4	64.0	9.7	12.1	14.2
20	6.0	6.9	52	549	2224	235	2.3	9.1	61.1	10.8	7.8	20.3
21	6.2	7.0	39	547	2180	212	2.4	8.4	64.9	10.6	8.4	16.1
22	6.1	7.0	53	515	2256	254	2.2	9.0	62.7	11.8	7.4	18.1
23	6.0	6.9	67	529	1701	150	2.2	6.9	61.7	9.1	9.9	19.3
24	6.3	7.0	62	809	2091	205	2.4	8.3	63.0	10.3	12.5	14.1
25	6.4	7.0	45	692	2175	195	2.0	8.1	67.2	10.1	11.0	11.7
26	6.6	7.0	65	788	1900	173	2.4	7.0	67.9	10.3	14.5	7.3
27	6.5	7.0	63	815	1999	183	2.0	7.6	65.8	10.1	13.8	10.3
28	6.8	7.0	93	783	1880	204	2.4	6.8	69.2	12.6	14.8	3.5
29	6.7	7.0	113	754	1703	192	1.8	6.4	66.6	12.6	15.2	5.7
30	6.4	7.0	90	728	2116	278	2.2	8.4	63.0	13.8	11.2	12.0
31	6.4	7.0	66	777	2419	260	2.4	9.2	65.8	11.8	10.9	11.5
32	6.0	7.0	104	728	2265	300	1.8	9.8	57.8	12.8	9.6	19.8
33	6.1	7.0	77	504	1860	186	2.4	7.4	62.9	10.5	8.8	17.8
34	6.1	7.0	131	453	2011	222	2.3	8.0	62.9	11.6	7.3	18.2
35	5.9	6.9	131	438	1852	244	2.0	8.0	57.9	12.8	7.1	22.2
36	6.3	7.0	163	599	1854	194	2.2	7.2	64.4	11.3	10.7	13.6
37	6.4	7.0	103	491	2166	240	1.8	8.0	67.7	12.6	7.9	11.8
38	6.6	7.0	100	731	2144	189	2.4	7.7	69.7	10.3	12.2	7.8
39	6.0	7.0	45	547	1675	182	1.7	7.1	59.0	10.7	9.9	20.3
40	6.2	7.0	44	659	1504	142	2.2	6.2	60.7	9.6	13.7	16.0
41	6.1	7.0	59	665	1794	173	2.4	7.4	60.7	9.8	11.6	18.0
42	5.9	6.9	58	481	1836	164	2.0	7.6	60.4	9.0	8.2	22.4

Operator: - GAYER FARMS
Field: HOG BARNS 3
Acres: 175.4

Lab #: 2447-15 (238)
Date: 02/20/2019
Submitted By: OPERATOR G

SOIL TEST RESULTS

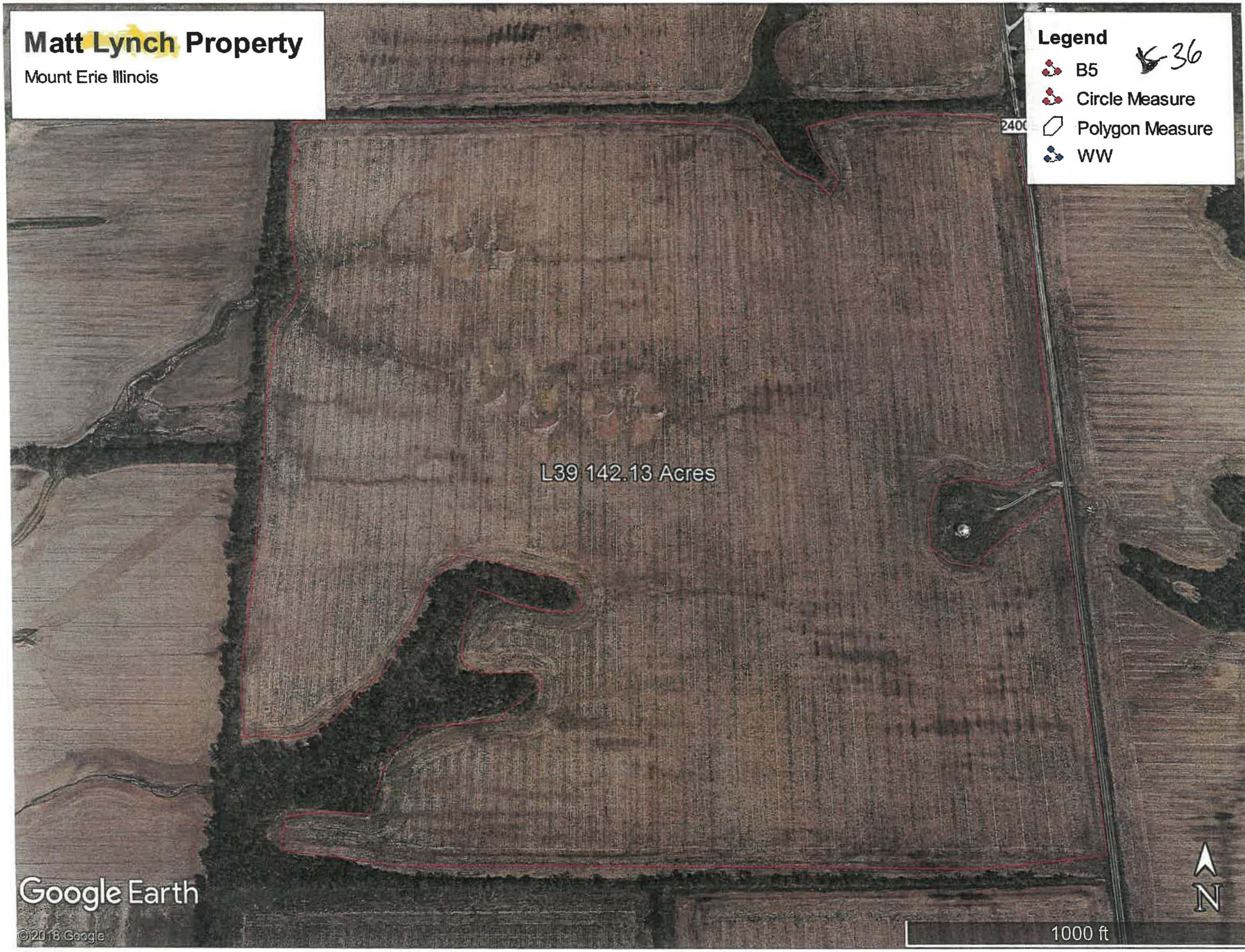
SOIL BUFFER P1 K Ca Mg OM CEC Base Saturation
SAMPLE# pH Ph Lbs/a Lbs/a Lbs/a Lbs/a % meg %Ca %Mg %K %H

1 of 2

238

43	5.4	6.3	78	384	1892	208	2.4	9.0	52.6	9.7	5.5	32.2
44	5.4	6.3	71	330	1612	130	2.3	7.3	55.3	7.5	5.8	31.4
45	6.6	7.0	155	714	2205	289	2.0	8.3	66.5	14.6	11.1	7.9
46	6.6	7.0	137	657	2096	257	1.8	7.8	67.2	13.8	10.8	8.1
47	5.9	6.9	108	578	1786	213	2.0	7.8	57.3	11.4	9.6	21.7
48	5.6	6.5	133	633	1905	290	2.4	9.4	50.7	12.9	8.7	27.7
49	6.3	7.0	242	749	1958	214	2.3	7.8	62.8	11.5	12.4	13.4
50	6.2	7.0	151	688	1713	178	2.5	7.0	61.2	10.6	12.7	15.5
51	5.9	6.8	177	576	1828	237	2.4	8.1	56.5	12.2	9.2	22.1
52	6.0	6.9	74	682	1917	236	2.3	8.3	57.8	11.9	10.6	19.7
53	6.0	6.9	103	652	1334	139	2.5	5.9	56.6	9.9	14.2	19.3
54	6.2	7.0	72	622	1675	158	2.2	6.7	62.6	9.9	12.0	15.6
55	6.2	7.0	109	556	1556	157	2.0	6.3	61.8	10.4	11.4	16.4
56	6.3	7.0	70	567	2196	231	2.4	8.3	66.2	11.6	8.8	13.4
57	6.2	7.0	152	499	1982	227	2.3	7.8	63.6	12.2	8.3	16.0
58	6.0	6.9	67	485	1818	162	2.5	7.3	62.3	9.3	8.6	19.8
59	5.8	6.8	67	422	2094	214	2.0	8.8	59.5	10.2	6.2	24.1
60	6.0	6.8	30	319	2682	224	2.8	10.1	66.4	9.3	4.1	20.2
61	6.0	6.9	21	251	2098	208	2.4	8.0	65.6	10.9	4.1	19.4
62	5.8	6.7	20	275	2195	223	2.2	8.9	61.7	10.5	4.0	23.8
63	6.0	7.0	46	313	2697	502	1.8	11.5	58.7	18.2	3.5	19.5
64	6.2	7.0	39	438	2577	267	2.2	9.7	66.5	11.5	5.8	16.2
65	5.7	6.6	35	409	2076	200	2.4	8.8	59.0	9.5	6.0	25.4
66	5.5	6.4	43	466	1675	175	2.4	7.9	53.1	9.3	7.6	30.1
67	5.5	6.5	72	480	1729	186	2.0	8.2	52.8	9.5	7.6	30.2
68	5.5	6.4	82	394	1124	102	2.4	5.3	53.1	8.1	9.6	29.3
69	5.7	6.6	72	505	1753	202	2.3	7.9	55.5	10.7	8.2	25.5
AVERAGE	6.2	6.9	83	619	2041	225	2.2	8.2	62.2	11.3	9.9	16.6

PH AVE. 6.2 EXTRACTED SAMPLES:16,28,43,44,66,67,68,
P1 AVE. 66 EXTRACTED SAMPLES: 4,
9,11,12,29,34,35,36,45,46,48,49,50,51,57,60,61,62,
K AVE. 636 EXTRACTED SAMPLES: 5, 6, 7,
9,14,16,17,19,24,26,27,28,34,35,42,43,44,59,60,61,62,63,64,65,66,67,68,


Matt Lynch Property
Mount Erie Illinois
Legend
B5
Circle Measure
Polygon Measure
WW
K-36
2406
L39 142.13 Acres
Google Earth
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1000 ft
N

KASKASKIA SCIENCES

KSI LABORATORIES

202 S. DACEY
SHELBYVILLE, ILLINOIS 62565
PHONE (217) 774-2421

ILLINOIS SOIL TESTING ASSOCIATION

OPERATOR: - LYNCH FARMS
FIELD: 49-280
ACRES:

LAB#: 310576-77 (26934)
DATE: 10/30/2018
SUBMITTED BY: OPERATOR L

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER pH	PHOSPHORUS lbs/A	POTASSIUM lbs/A	CALCIUM lbs/A	MAGNESIUM lbs/A	ORGANIC MATTER %	CATION EXCHANGE CAPACITY	BASE SATURATION %Ca	%Mg	%K	%H
E	6.1	7.0	52	313	2851	160	2.2	10.0	71.3	6.7	4.1	17.9
W	6.0	6.9	48	271	2445	146	2.3	8.8	69.5	7.0	4.0	19.5
AVERAGE	6.1	6.9	50	292	2648	153	2.3	9.4	70.4	6.8	4.0	18.7

RECOMMENDATIONS (LBS/ACRE)
===========================

SUMMARY - FIELD AVERAGES

YLD/CROP		N	P2O5	K2O
180/	MAINT.	221	78	51
CORN/	BUILDUP.	-	0	8
	TOTAL	221	78	59
55/	MAINT.	0	47	72
BEANS/	BUILDUP.	-	0	8
	TOTAL	0	47	80

LIME: 0 TON(S) OF LIMESTONE PER ACRE
* IF CORN FOLLOWS SOYBEANS SUBTRACT 30 LBS OF N

KSI LABORATORIES

202 S. DACEY
SHELBYVILLE, ILLINOIS 62565
PHONE (217) 774-2421

KASKASKIA SCIENCES

Illinois Soil Testing Association

OPERATOR:	MATT LYNCH	**LAB#:**	346675-78 (30288)
FIELD:	49-280	**DATE:**	11/04/2016
ACRES:		**SUBMITTED BY:**	OPERATOR L

SOIL TEST RESULTS

SAMPLE#	SOIL pH	BUFFER pH	PHOSPHORUS lbs/A	POTASSIUM lbs/A	CALCIUM lbs/A	MAGNESIUM lbs/A	ORGANIC MATTER %	CATION EXCHANGE CAPACITY	BASE SATURATION %Ca	%Mg	%K	%H
NE	6.1	7.0	30	172	2581	197	2.5	9.1	71.0	9.1	2.5	17.5
SE	6.3	7.0	48	248	2780	197	2.4	9.4	74.0	8.8	3.4	13.8
NW	6.2	7.0	51	204	2581	197	2.5	9.0	71.7	9.2	3.0	16.1
SW	6.1	7.0	36	176	2581	197	2.3	9.1	71.0	9.1	2.6	17.4
AVERAGE	6.2	7.0	41	200	2631	197	2.4	9.1	71.9	9.0	2.8	16.2

PH AVE. 6.2 EXTRACTED SAMPLES:
P1 AVE. 41 EXTRACTED SAMPLES:
K AVE. 200 EXTRACTED SAMPLES:

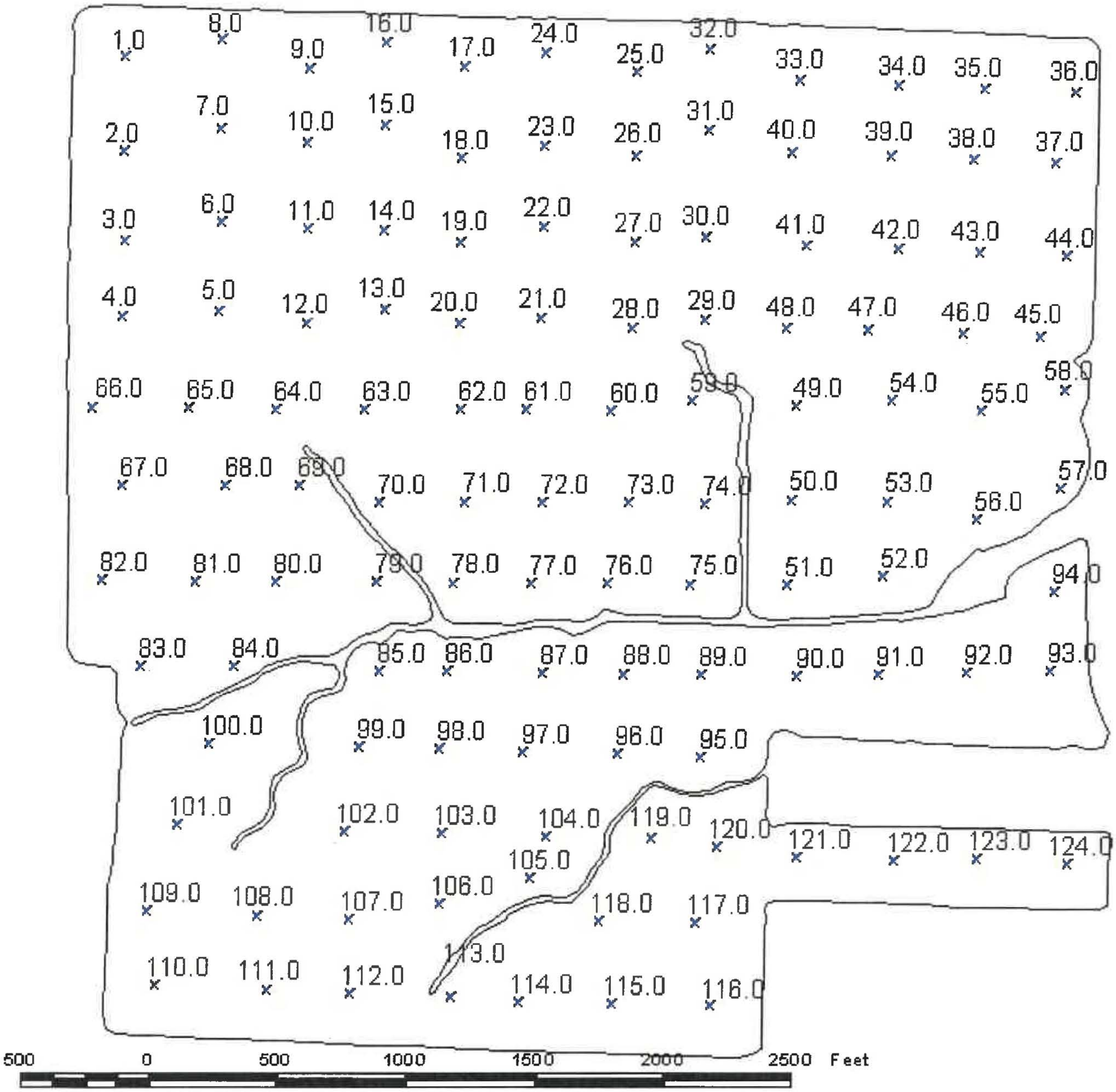
RECOMMENDATIONS (LBS/ACRE)

SUMMARY - FIELD AVERAGES

YLD/CROP		N	P2O5	K2O
150/	MAINT.	184	65	43
CORN/	BUILDUP.	-	20	86
	TOTAL	184	85	129
50/	MAINT.	0	43	65
BEANS/	BUILDUP.	-	20	100
	TOTAL	0	63	165

LIME: 0 TON(S) OF LIMESTONE PER ACRE
* IF CORN FOLLOWS SOYBEANS SUBTRACT 30 LBS OF N

Bass; 13 (328.49 ac.)



Date: Jun 7,2013
Field Name: Bass; 13
Location: Wayne Co., Illinois, U.S.
Section 31, T2N, R9E
Farm Name: Eckel Farms
Client Name: Ritters Farm Supply
Total Acres: 328.49
Field Boundary Start Location:
Latitude: 38.56255394
Longitude: -88.24031794

Sample Pts.
(328.5ac.) Field Boundary

Southern Illinois Soil Laboratory

375 North Old Route 66, PO Box 448, Hamel, IL 62046

Office (618) 633-1811 Fax (618) 633-1810

E-Mail Address * sisl@madisontelco.com

SISL Client ID #: 43
Order #: 56724
Grower: Eckel

Farm ID: Eckel
Field ID: Bass

Client: ICS
2656 County Highway 2
Mt. Erie, IL 62446

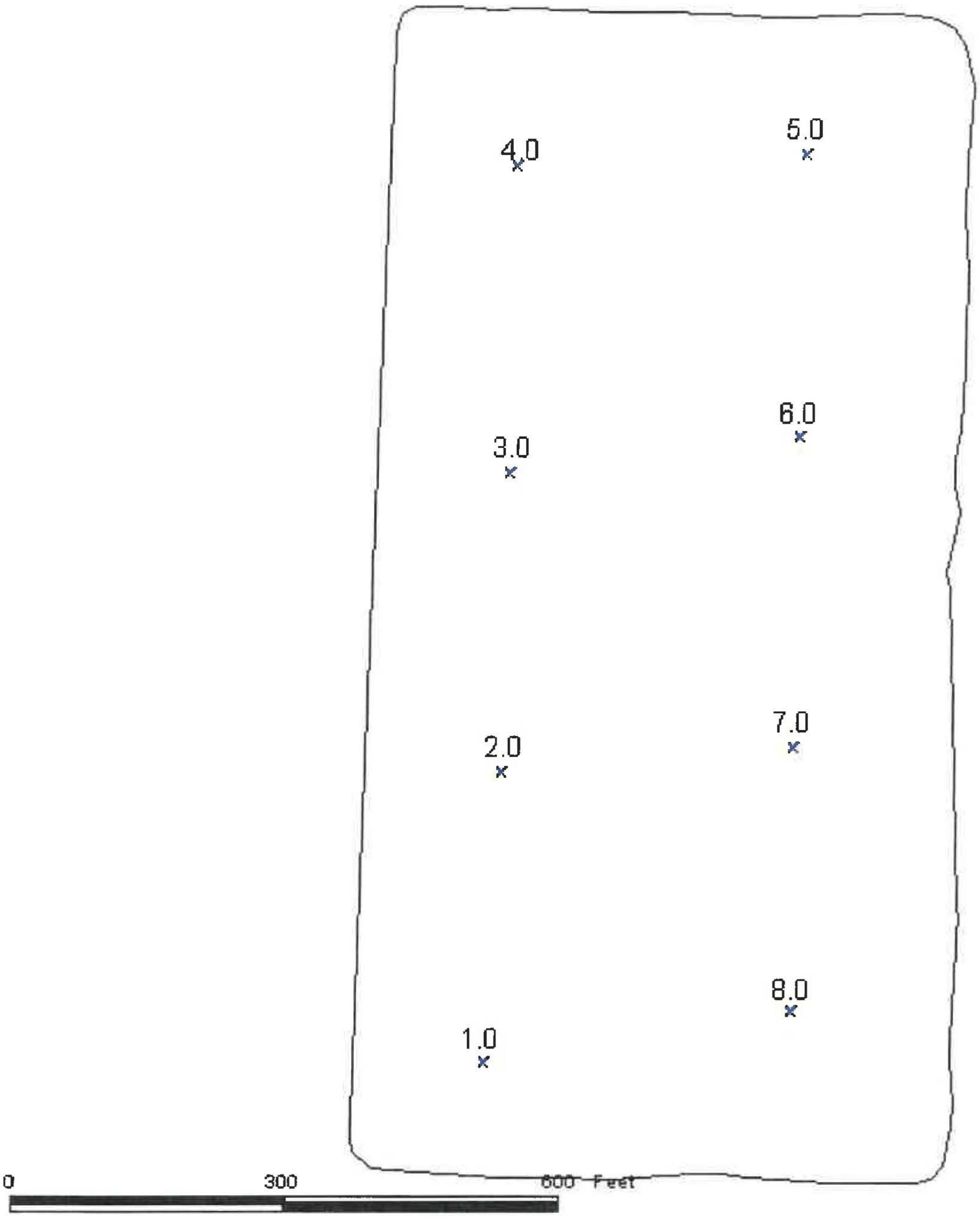
LAB #	Sample#	Wph	BpH	OM%	OM LBS/A	P LBS/A	K LBS/A	Ca LBS/A	Mg LBS/A	CEC	PERCENT SATURATION				S LBS/A	Zn LBS/A	Fe LBS/A	Mn LBS/A	Cu LBS/A	B LBS/A	Na LBS/A
											H	Ca	Mg	K							
441438	1	5.7		2.7	53	44	466	2061	189	8.9	20.1	57.7	8.8	13.4							
441439	2	5.7		2.5	50	34	450	1657	171	7.8	23.1	53.0	9.1	14.8							
441440	3	5.6		2.6	52	31	429	1547	180	7.6	24.9	50.8	9.8	14.4							
441441	4	6.3		2.0	40	65	392	3079	251	10.9	11.0	70.3	9.6	9.2							
441442	5	6.0		2.3	47	111	443	2993	236	11.1	13.5	67.4	8.9	10.2							
441443	6	6.1		2.0	40	46	342	2522	186	9.4	15.0	67.4	8.3	9.4							
441444	7	6.4		1.6	32	62	323	2679	170	9.3	11.8	71.8	7.6	8.9							
441445	8	6.1		1.8	37	65	324	2550	238	9.6	14.6	66.4	10.3	8.7							
441446	9	5.5		2.6	52	24	337	1389	150	7.0	28.7	49.9	9.0	12.4							
441447	10	6.0		2.5	50	26	391	2072	144	8.3	18.1	62.5	7.2	12.1							
441448	11	6.4		1.7	34	51	452	2943	161	10.3	10.7	71.5	6.5	11.3							
441449	12	6.4		2.3	47	67	451	2938	167	10.3	10.7	71.3	6.8	11.2							
441450	13	6.7		2.0	40	63	394	3350	192	11.0	7.3	76.2	7.3	9.2							
441451	14	6.9		2.0	40	50	412	3160	214	10.4	5.7	75.6	8.5	10.1							
441452	15	5.8		1.3	25	57	399	2162	185	8.9	19.1	60.7	8.7	11.5							
441453	16	6.1		2.2	44	97	621	2411	219	9.9	14.1	60.7	9.2	16.0							
441454	17	6.2		2.7	54	35	395	2938	209	10.5	12.3	69.8	8.3	9.6							
441455	18	6.3		2.4	48	68	453	2591	172	9.6	12.6	67.8	7.5	12.2							
441456	19	6.5		1.7	35	59	405	2687	169	9.5	10.6	71.0	7.4	11.0							
441457	20	5.2		2.8	56	38	275	1295	148	6.9	33.5	47.2	9.0	10.3							
441458	21	6.1		2.6	52	96	509	2558	209	10.0	14.0	64.1	8.7	13.1							
441459	22	5.9		2.6	52	42	485	2015	189	8.7	18.5	58.1	9.1	14.3							
441460	23	6.6		2.7	53	48	451	2987	224	10.5	8.6	71.4	8.9	11.1							
441461	24	6.1		2.5	49	40	443	2376	190	9.3	15.1	64.1	8.5	12.3							
441462	25	6.9		2.4	47	50	357	3352	226	10.8	5.5	77.3	8.7	8.4							

LAB #	Sample#	Wph	BpH	OM%	OM LBS/A	P LBS/A	K LBS/A	Ca LBS/A	Mg LBS/A	CEC	PERCENT SATURATION				S LBS/A	Zn LBS/A	Fe LBS/A	Mn LBS/A	Cu LBS/A	B LBS/A	Na LBS/A
											H	Ca	Mg	K							
441463	26	6.2		2.2	44	35	501	2438	199	9.5	13.7	64.1	8.7	13.5							
441464	27	6.3		1.7	35	40	489	2116	173	8.5	14.2	62.5	8.5	14.8							
441465	28	5.5		2.6	53	34	395	1433	187	7.4	27.1	48.6	10.6	13.7							
441466	29	6.4		2.5	50	60	449	2909	204	10.4	10.6	70.1	8.2	11.1							
441467	30	5.6		2.5	50	27	419	2061	186	8.9	21.3	57.9	8.7	12.1							
441468	31	6.3		2.1	41	43	415	2867	200	10.3	11.7	69.8	8.1	10.4							
441469	32	6.3		2.0	41	68	401	2954	186	10.4	11.6	71.1	7.5	9.9							
441470	33	5.5		2.4	48	47	555	1595	179	8.2	24.5	48.9	9.1	17.4							
441471	34	5.9		2.5	50	54	625	2078	172	9.1	17.6	57.0	7.9	17.6							
441472	35	6.0		1.7	34	82	539	1938	152	8.4	17.9	58.0	7.6	16.5							
441473	36	6.1		2.1	42	56	531	2094	165	8.7	16.1	60.3	7.9	15.7							
441474	37	5.9		1.3	26	53	556	2065	178	8.9	17.9	57.8	8.3	16.0							
441475	38	5.5		1.6	31	39	396	1321	135	6.9	29.1	48.0	8.2	14.8							
441476	39	5.6		1.5	30	39	425	1236	133	6.6	28.6	46.6	8.4	16.4							
441477	40	5.5		2.3	46	33	555	1463	160	7.7	25.8	47.2	8.6	18.4							
441478	41	5.5		2.4	49	41	534	1430	165	7.6	26.2	46.8	9.0	17.9							
441479	42	5.7		2.0	39	47	444	1617	145	7.6	23.7	53.3	8.0	15.0							
441480	43	5.2		2.0	41	57	424	1072	125	6.6	34.9	40.7	7.9	16.5							
441481	44	5.3		2.1	41	41	393	1212	148	6.9	32.1	44.2	9.0	14.7							
441482	45	5.7		2.5	50	56	446	1647	156	7.7	23.3	53.4	8.4	14.8							
441483	46	5.4		2.3	46	81	433	1646	219	8.2	25.5	50.0	11.1	13.5							
441484	47	5.3		2.3	46	76	402	1102	105	6.4	34.3	42.9	6.8	16.0							
441485	48	5.9		2.0	40	45	433	1626	146	7.4	21.7	55.1	8.2	15.0							
441486	49	5.7		2.1	43	46	377	1387	191	7.0	25.6	49.3	11.3	13.8							
441487	50	6.3		2.1	41	37	293	2047	229	8.0	15.0	63.8	11.9	9.4							
441488	51	6.6		2.0	40	34	178	2916	274	9.8	9.2	74.5	11.7	4.7							
441489	52	5.3		2.5	50	45	184	1428	189	7.0	31.3	50.8	11.2	6.7							
441490	53	5.8		2.2	44	31	220	1461	138	6.5	26.2	56.3	8.9	8.7							
441491	54	5.1		2.7	53	63	367	939	147	6.3	38.1	37.3	9.7	14.9							
441492	55	6.2		3.0	61	42	267	2848	369	10.6	12.2	66.9	14.4	6.4							
441493	56	6.5		2.0	41	34	266	2268	196	8.2	12.2	69.4	10.0	8.3							
441494	57	6.3		1.6	33	25	181	2061	188	7.6	15.8	67.8	10.3	6.1							
441495	58	6.7		1.9	38	168	529	3037	255	10.8	7.4	70.2	9.8	12.5							
441496	59	6.4		2.2	44	42	523	2512	202	9.6	11.5	65.7	8.8	14.0							

LAB #	Sample#	Wph	BpH	OM%	OM LBS/A	P LBS/A	K LBS/A	Ca LBS/A	Mg LBS/A	CEC	PERCENT SATURATION				S LBS/A	Zn LBS/A	Fe LBS/A	Mn LBS/A	Cu LBS/A	B LBS/A	Na LBS/A
											H	Ca	Mg	K							
441497	60	6.4		1.8	37	31	328	2348	160	8.5	13.0	69.2	7.9	9.9							
441498	61	5.7		2.4	48	33	374	1751	161	7.8	23.1	56.1	8.6	12.3							
441499	62	6.0		1.8	35	25	359	2099	185	8.4	17.8	62.2	9.1	10.9							
441500	63	6.3		1.9	37	27	501	2263	186	8.9	13.5	63.4	8.7	14.4							
441501	64	5.8		1.6	31	38	306	1859	139	7.7	22.0	60.3	7.5	10.2							
441502	65	6.2		2.1	41	26	394	2744	197	10.0	13.0	68.7	8.2	10.1							
441503	66	6.1		1.8	35	42	461	2383	167	9.2	15.2	64.5	7.5	12.8							
441504	67	6.3		1.5	30	42	426	2563	152	9.3	12.9	68.7	6.8	11.7							
441505	68	6.5		1.9	38	40	435	2935	165	10.1	9.9	72.4	6.8	11.0							
441506	69	5.9		2.0	41	27	335	2153	149	8.5	18.9	63.6	7.3	10.2							
441507	70	6.0		1.6	33	22	358	2157	169	8.5	17.6	63.3	8.3	10.8							
441508	71	6.1		1.9	38	29	368	1740	149	7.3	19.1	59.5	8.5	12.9							
441509	72	6.0		2.1	42	22	383	2282	173	8.9	16.8	64.0	8.1	11.0							
441510	73	6.1		1.5	30	39	326	2349	178	8.9	15.8	66.4	8.4	9.4							
441511	74	6.3		2.3	45	73	311	2367	163	8.6	14.0	68.9	7.9	9.3							
441512	75	5.9		1.9	37	39	286	2142	161	8.4	19.1	64.1	8.0	8.8							
441513	76	6.1		1.9	39	33	307	2549	195	9.4	14.9	68.0	8.7	8.4							
441514	77	6.1		2.0	40	24	306	2133	184	8.3	16.9	64.4	9.3	9.5							
441515	78	5.9		2.4	49	27	291	2152	176	8.5	18.9	63.6	8.7	8.8							
441516	79	6.0		2.6	53	33	445	2004	172	8.4	17.9	59.9	8.6	13.6							
441517	80	6.1		2.1	43	43	431	2228	144	8.7	16.1	64.2	6.9	12.7							
441518	81	6.1		2.1	42	41	486	1816	131	7.7	18.1	58.7	7.1	16.1							
441519	82	6.4		2.0	41	35	391	2400	146	8.7	12.6	68.9	7.0	11.5							
441520	83	6.1		1.9	38	43	359	2244	142	8.5	16.4	65.8	6.9	10.8							
441521	84	6.0		2.0	40	60	374	2191	170	8.6	17.4	63.4	8.2	11.1							
441522	85	5.8		2.1	43	33	350	2134	158	8.6	19.8	62.1	7.7	10.4							
441523	86	5.5		2.6	52	38	301	1705	272	8.2	24.5	52.2	13.9	9.4							
441524	87	6.3		2.2	44	27	219	2501	245	9.0	13.3	69.2	11.3	6.2							
441525	88	5.4		2.6	51	26	254	1667	180	7.7	27.4	54.3	9.8	8.5							
441526	89	5.8		2.3	47	32	230	1779	174	7.5	22.8	59.6	9.7	7.9							
441527	90	5.8		2.4	48	35	247	2094	172	8.3	20.5	63.2	8.7	7.6							
441528	91	5.7		2.7	55	24	188	2013	211	8.2	22.0	61.4	10.7	5.9							
441529	92	5.5		2.6	52	19	246	2686	248	10.4	19.3	64.7	10.0	6.1							
441530	93	5.6		2.3	46	31	195	2094	166	8.3	22.8	62.9	8.3	6.0							

LAB #	Sample#	Wph	BpH	OM%	OM LBS/A	P LBS/A	K LBS/A	Ca LBS/A	Mg LBS/A	CEC	PERCENT SATURATION				S LBS/A	Zn LBS/A	Fe LBS/A	Mn LBS/A	Cu LBS/A	B LBS/A	Na LBS/A
											H	Ca	Mg	K							
441531	94	6.3		1.5	29	70	252	2565	160	8.9	13.4	71.8	7.5	7.2							
441532	95	6.1		1.9	38	33	197	2377	182	8.6	16.3	69.1	8.8	5.9							
441533	96	5.7		1.9	37	59	263	2169	183	8.7	20.8	62.6	8.8	7.8							
441534	97	6.2		2.4	49	54	279	2656	149	9.3	14.0	71.6	6.7	7.7							
441535	98	5.8		2.3	46	48	323	1854	125	7.7	22.1	60.3	6.8	10.8							
441536	99	6.3		1.9	37	83	417	2360	146	8.8	13.7	67.2	6.9	12.2							
441537	100	5.7		2.1	42	47	331	1268	115	6.3	28.6	50.3	7.6	13.5							
441538	101	6.0		1.8	36	69	304	1765	114	7.2	20.9	61.6	6.6	10.9							
441539	102	6.0		2.7	53	68	371	2389	171	9.1	16.4	65.4	7.8	10.4							
441540	103	6.7		1.7	35	90	340	2936	194	9.8	8.1	74.7	8.2	8.9							
441541	104	6.3		1.9	38	57	349	2774	164	9.7	12.4	71.4	7.0	9.2							
441542	105	6.3		2.1	43	48	309	2544	150	9.0	13.4	70.8	7.0	8.8							
441543	106	5.8		2.4	49	46	418	2139	161	8.8	19.3	60.8	7.6	12.2							
441544	107	5.9		1.6	33	51	366	1781	122	7.5	21.3	59.4	6.8	12.5							
441545	108	6.3		2.1	42	77	374	2486	142	9.0	13.4	69.3	6.6	10.7							
441546	109	6.1		1.7	34	37	352	2702	221	10.0	14.0	67.7	9.2	9.0							
441547	110	6.3		1.5	30	67	298	2436	156	8.7	13.8	70.0	7.5	8.8							
441548	111	5.6		2.0	40	38	270	1510	113	6.8	27.8	55.2	6.9	10.1							
441549	112	6.0		2.1	42	31	284	2283	219	8.8	17.0	64.5	10.3	8.2							
441550	113	6.2		2.1	43	61	415	2305	210	9.0	14.4	64.0	9.7	11.8							
441551	114	6.0		2.2	44	42	357	2047	128	8.1	18.6	63.4	6.6	11.3							
441552	115	6.5		2.3	46	43	369	2789	165	9.6	10.4	72.6	7.2	9.8							
441553	116	6.5		1.8	37	39	273	2627	144	8.9	11.3	74.1	6.8	7.9							
441554	117	6.6		1.4	28	60	291	2694	146	9.0	10.0	74.9	6.8	8.3							
441555	118	5.8		1.4	28	41	271	1695	133	7.2	23.7	59.0	7.7	9.7							
441556	119	5.7		2.2	43	50	288	1416	114	6.6	27.5	54.0	7.2	11.3							
441557	120	6.0		1.9	38	41	291	1914	112	7.5	20.0	63.8	6.2	10.0							
441558	121	6.5		1.8	36	76	243	2930	154	9.6	10.4	76.4	6.7	6.5							
441559	122	6.6		1.7	34	67	146	3124	153	9.7	9.3	80.3	6.6	3.9							
441560	123	6.5		2.0	40	60	119	2727	124	8.6	11.6	78.9	6.0	3.5							
441561	124	6.8		1.9	37	57	133	3172	168	9.7	7.2	82.0	7.2	3.5							
AVERAGE		*6.0*		*2.1*	*42*	*48*	*366*	*2210*	*175*	*8.7*	*17.7*	*62.9*	*8.4*	*11.0*							

Iles East; 13 (18.72 ac.)



Date: Jun 7, 2013
Field Name: Iles East; 13
Location: Wayne Co., Illinois, U.S.
Section 32, T2N, R9E
Farm Name: Eckel Farms
Client Name: Ritters Farm Supply
Total Acres: 18.72
Field Boundary Start Location:
Latitude: 38.55861335
Longitude: -88.22641334

Sample Pts.
(18.7ac.) Field Boundary

Southern Illinois Soil Laboratory

375 North Old Route 66, PO Box 448, Hamel, IL 62046
Office (618) 633-1811 Fax (618) 633-1810
E-Mail Address * sisl@madisontelco.com

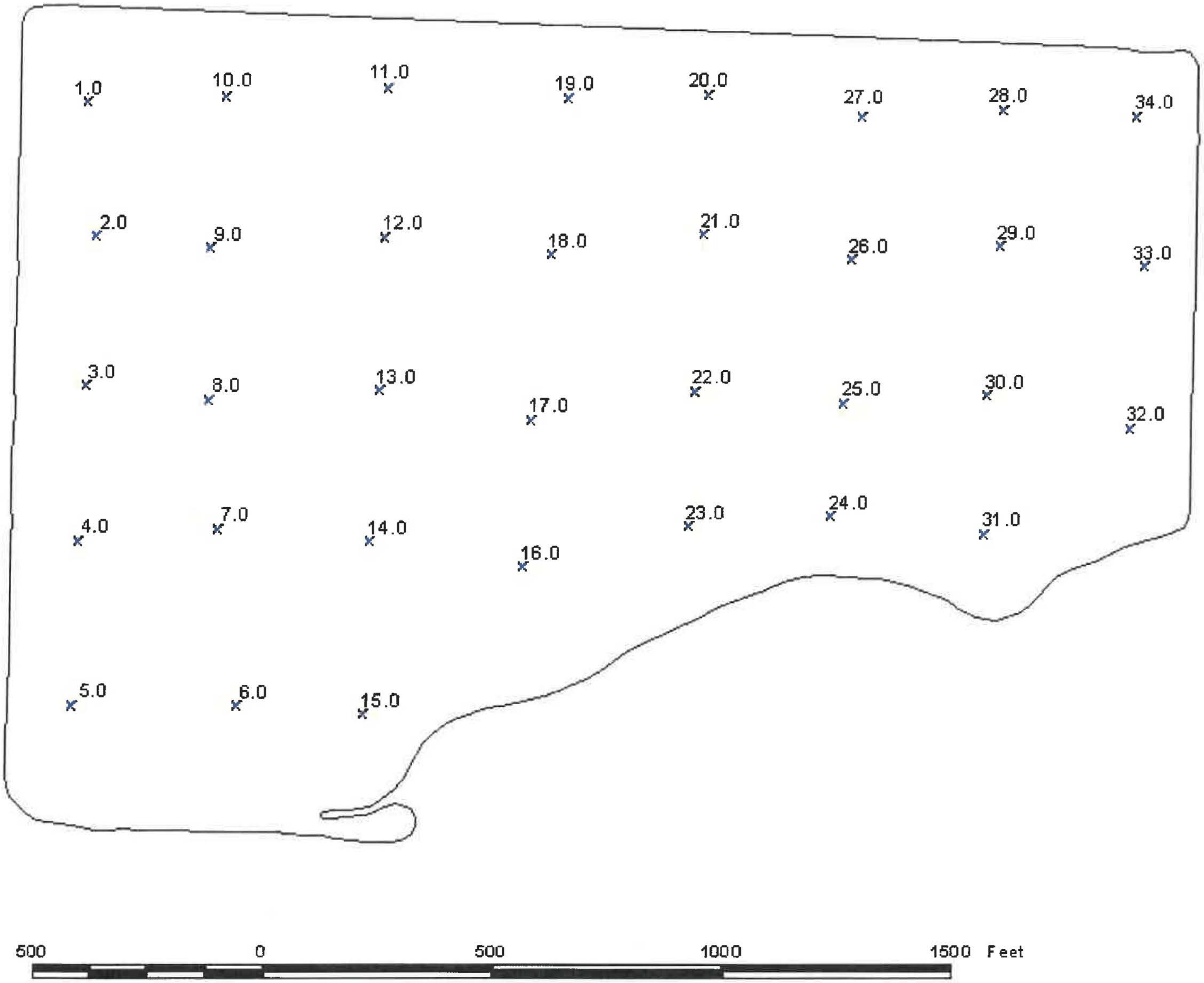
SISL Client ID #: 43
Order #: 56856
Grower: Eckel

Farm ID: Eckel
Field ID: Iles E

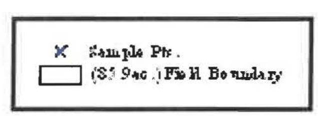
Client: ICS
2656 County Highway 2
Mt. Erie, IL 62446

LAB #	Sample#	Wph	BpH	OM%	OM LBS/A	P LBS/A	K LBS/A	Ca LBS/A	Mg LBS/A	CEC	PERCENT SATURATION				S LBS/A	Zn LBS/A	Fe LBS/A	Mn LBS/A	Cu LBS/A	B LBS/A	Na LBS/A
											H	Ca	Mg	K							
442732	1	6.1		2.0	40	35	205	2162	205	8.2	17.1	66.0	10.4	6.4							
442733	2	6.2		2.5	50	36	233	2080	210	8.0	16.3	65.2	11.0	7.5							
442734	3	6.3		2.5	50	32	239	2648	261	9.5	12.6	69.5	11.4	6.4							
442735	4	6.0		2.0	39	33	215	2459	276	9.3	16.0	65.8	12.3	5.9							
442736	5	5.7		2.4	49	36	238	2180	284	9.0	19.9	60.3	13.1	6.7							
442737	6	5.8		2.4	47	32	254	2010	254	8.4	20.2	59.6	12.5	7.7							
442738	7	5.9		2.5	50	27	191	1933	210	7.8	20.5	62.0	11.2	6.3							
442739	8	5.8		2.4	48	37	159	1855	213	7.6	22.3	60.8	11.6	5.3							
AVERAGE		6.0		2.3	47	34	217	2166	239	8.5	18.1	63.6	11.7	6.5							

Iles North; 13 (85.89 ac.)



Date: Jun 7, 2013
Field Name: Iles North; 13
Location: Wayne Co., Illinois, U.S.
Section 32, T2N, R9E
Farm Name: Eckel Farms
Client Name: Ritters Farm Supply
Total Acres: 85.89
Field Boundary Start Location:
Latitude: 38.56228250
Longitude: -88.22732795



Southern Illinois Soil Laboratory

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Office (618) 633-1811 Fax (618) 633-1810

E-Mail Address * sisl@madisontelco.com

SISL Client ID #: 43
Order #: 56853
Grower: Eckel

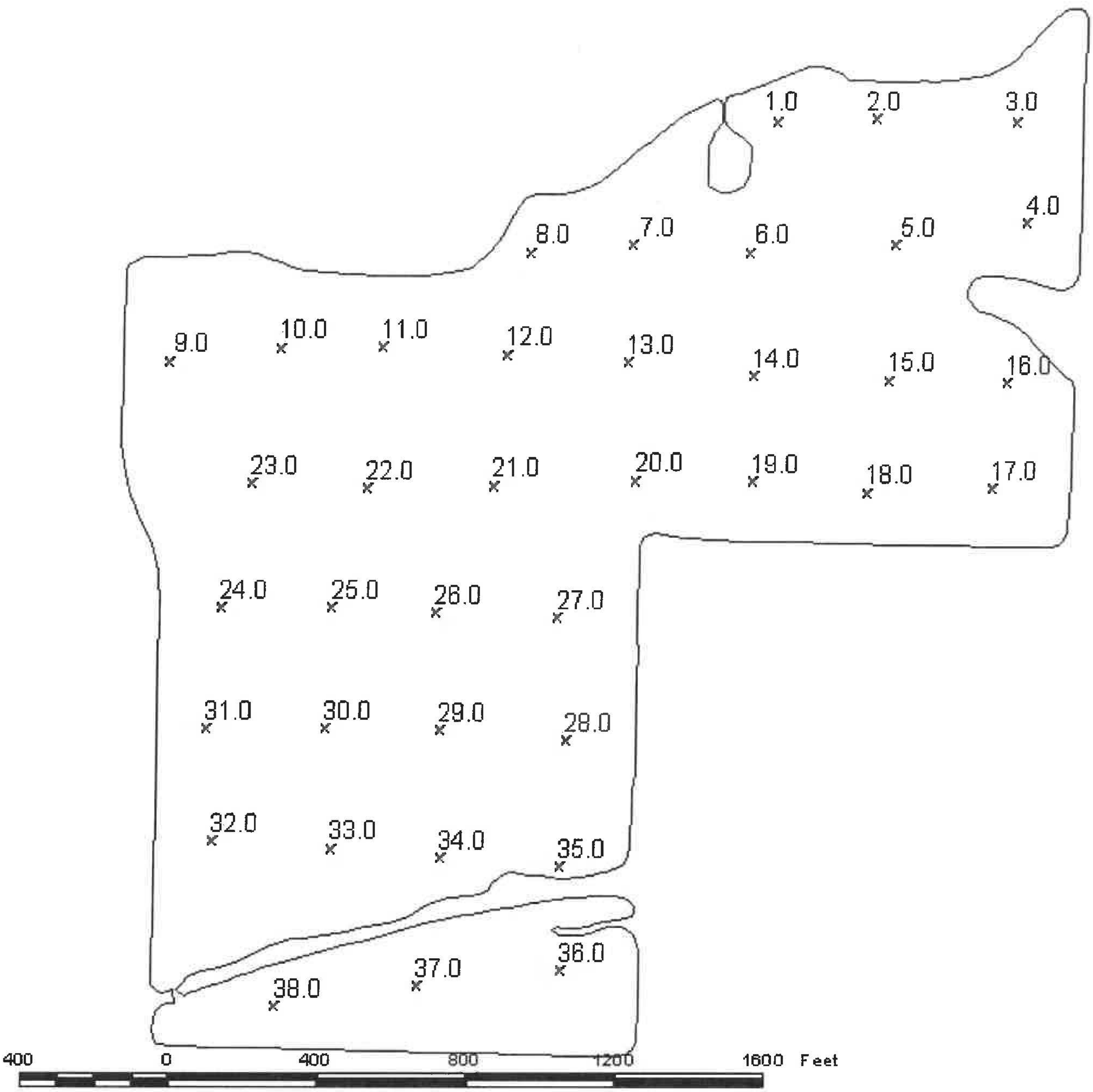
Farm ID: Eckel
Field ID: Iles N

Client: ICS
2656 County Highway 2
Mt. Erie, IL 62446

LAB #	Sample#	Wph	BpH	OM%	OM LBS/A	P LBS/A	K LBS/A	Ca LBS/A	Mg LBS/A	CEC	PERCENT SATURATION				S LBS/A	Zn LBS/A	Fe LBS/A	Mn LBS/A	Cu LBS/A	B LBS/A	Na LBS/A
											H	Ca	Mg	K							
442659	1	5.5		2.3	46	89	352	1656	172	7.8	25.8	53.4	9.2	11.6							
442660	2	5.5		2.2	44	77	481	1317	163	7.2	27.8	45.7	9.4	17.1							
442661	3	5.3		2.0	40	79	319	1032	132	6.1	35.8	42.0	8.9	13.3							
442662	4	5.8		2.2	43	59	332	1571	176	7.2	23.6	54.5	10.2	11.8							
442663	5	5.4		2.4	48	46	258	1265	159	6.6	31.9	48.0	10.1	10.0							
442664	6	5.7		2.4	47	77	352	1196	165	6.4	28.2	46.9	10.8	14.1							
442665	7	5.4		2.1	42	82	309	1151	125	6.3	33.4	45.7	8.3	12.6							
442666	8	5.6		2.7	54	62	343	1125	161	6.3	30.3	44.9	10.7	14.0							
442667	9	5.9		2.1	41	58	267	2017	203	8.2	19.6	61.7	10.3	8.4							
442668	10	5.6		2.1	41	51	346	1458	214	7.3	25.9	49.8	12.2	12.1							
442669	11	5.8		2.3	45	47	230	1404	199	6.6	25.6	52.9	12.5	8.9							
442670	12	5.5		2.1	42	52	288	1407	227	7.2	27.8	48.8	13.1	10.3							
442671	13	5.5		2.0	40	35	266	1183	132	6.2	32.3	47.8	8.9	11.0							
442672	14	5.6		2.7	54	35	281	1469	205	7.1	26.6	51.4	12.0	10.1							
442673	15	5.3		2.1	42	65	349	1148	134	6.5	33.7	44.0	8.6	13.7							
442674	16	5.9		1.4	29	17	237	1540	208	6.9	23.1	55.6	12.5	8.8							
442675	17	5.9		2.2	44	24	196	2043	192	8.0	20.0	63.8	10.0	6.3							
442676	18	5.8		3.4	68	31	311	1582	178	7.2	23.6	55.0	10.3	11.1							
442677	19	5.6		2.1	42	105	501	1346	214	7.4	25.5	45.2	12.0	17.3							
442678	20	5.8		1.9	38	40	230	1935	223	8.1	21.1	60.0	11.5	7.3							
442679	21	5.7		2.2	45	42	221	2102	209	8.5	21.2	61.9	10.3	6.7							
442680	22	6.5		2.2	45	37	227	2917	245	9.9	10.1	73.7	10.3	5.9							
442681	23	5.9		2.2	43	26	237	2079	237	8.4	19.1	61.9	11.8	7.2							
442682	24	5.8		2.2	45	58	194	1743	187	7.3	23.2	59.4	10.6	6.8							
442683	25	6.5		1.8	37	31	156	2407	225	8.4	12.0	72.0	11.2	4.8							

LAB #	Sample#	Wph	BpH	OM%	OM LBS/A	P LBS/A	K LBS/A	Ca LBS/A	Mg LBS/A	CEC	PERCENT SATURATION H	Ca	Mg	K	S LBS/A	Zn LBS/A	Fe LBS/A	Mn LBS/A	Cu LBS/A	B LBS/A	Na LBS/A
442684	26	6.0		2.6	52	204	525	1692	207	7.9	18.9	53.3	10.9	17.0							
442685	27	5.8		2.1	43	41	254	1548	206	7.1	24.0	54.7	12.1	9.2							
442686	28	6.4		1.8	36	21	197	2017	209	7.5	14.6	67.1	11.6	6.7							
442687	29	6.3		2.3	46	18	233	2251	247	8.5	14.2	66.6	12.2	7.1							
442688	30	6.3		1.7	34	19	234	2124	224	8.0	14.9	66.0	11.6	7.5							
442689	31	6.3		1.5	30	43	346	2056	210	8.1	14.8	63.4	10.8	10.9							
442690	32	6.0		2.0	40	19	280	1974	224	8.1	18.5	61.0	11.5	8.9							
442691	33	6.5		2.2	45	41	144	2670	236	9.0	11.1	73.9	10.9	4.1							
442692	34	6.5		2.0	40	45	283	2585	256	9.3	10.8	69.8	11.5	7.8							
AVERAGE		*5.9*		*2.2*	*43*	*52*	*288*	*1736*	*197*	*7.5*	*22.6*	*56.5*	*10.8*	*10.0*							

Iles South; 13 (97.34 ac.)



Date: Jun 7, 2013
Field Name: Iles South; 13
Location: Wayne Co., Illinois, U.S.
Section 32, T2N, R9E
Farm Name: Eckel Farms
Client Name: Ritters Farm Supply
Total Acres: 97.34
Field Boundary Start Location:
Latitude: 38.55830730
Longitude: -88.23037036

× Sample Pts.
(97.34ac.) Field Boundary

Southern Illinois Soil Laboratory

375 North Old Route 66, PO Box 448, Hamel, IL 62046
Office (618) 633-1811 Fax (618) 633-1810
*E-Mail Address * sisl@madisontelco.com*

SISL Client ID #: 43
Order #: 56855
Grower: Eckel

Farm ID: Eckel
Field ID: Iles S

Client: ICS
2656 County Highway 2
Mt. Erie, IL 62446

LAB #	Sample#	Wph	BpH	OM%	OM LBS/A	P LBS/A	K LBS/A	Ca LBS/A	Mg LBS/A	CEC	PERCENT SATURATION				S LBS/A	Zn LBS/A	Fe LBS/A	Mn LBS/A	Cu LBS/A	B LBS/A	Na LBS/A
											H	Ca	Mg	K							
442694	1	5.2		2.0	40	102	350	959	80	5.9	38.8	40.4	5.6	15.1							
442695	2	5.2		1.3	26	83	380	1085	92	6.4	36.1	42.6	6.0	15.3							
442696	3	5.3		1.8	36	27	245	1147	151	6.3	34.8	45.3	9.9	9.9							
442697	4	6.2		2.3	46	14	274	2648	308	9.9	13.1	66.8	13.0	7.1							
442698	5	5.5		2.3	47	37	508	1718	284	8.8	22.8	48.9	13.5	14.8							
442699	6	5.7		2.3	46	47	330	1710	195	7.7	23.3	55.3	10.5	10.9							
442700	7	6.1		1.6	33	25	279	2147	185	8.3	17.0	65.0	9.3	8.7							
442701	8	5.5		2.4	49	21	216	1815	221	8.0	25.0	56.6	11.5	6.9							
442702	9	5.9		2.7	54	116	844	1772	182	9.0	17.9	49.5	8.5	24.2							
442703	10	5.1		2.5	50	32	358	1051	108	6.4	37.5	41.1	7.0	14.4							
442704	11	5.9		2.6	52	25	428	2220	221	9.2	17.5	60.5	10.0	12.0							
442705	12	5.2		2.0	41	40	341	927	141	6.1	37.8	38.1	9.7	14.4							
442706	13	5.1		2.0	40	51	522	784	150	6.3	38.0	31.0	9.9	21.2							
442707	14	5.3		2.6	52	71	446	1096	179	6.8	32.2	40.1	10.9	16.7							
442708	15	5.3		2.6	51	44	454	1113	218	7.1	31.2	39.4	12.9	16.5							
442709	16	5.4		2.5	49	79	527	1341	234	7.8	27.0	43.1	12.5	17.4							
442710	17	5.3		2.6	52	44	433	1265	219	7.4	29.8	42.8	12.4	15.0							
442711	18	5.5		2.6	51	35	342	1498	229	7.6	26.4	49.4	12.6	11.6							
442712	19	5.6		2.5	50	57	335	1442	199	7.2	26.4	50.1	11.5	11.9							
442713	20	5.3		2.1	42	66	229	1051	126	5.9	37.0	44.2	8.8	9.9							
442714	21	5.2		2.6	53	44	338	995	124	6.2	37.3	40.3	8.4	14.0							
442715	22	5.2		2.0	39	53	291	929	86	5.7	40.2	40.6	6.3	13.0							
442716	23	5.3		2.1	43	49	232	833	88	5.2	42.0	39.7	7.0	11.3							
442717	24	5.8		2.2	44	71	258	1778	203	7.7	22.2	58.1	11.1	8.6							
442718	25	5.9		2.2	44	65	233	1420	167	6.4	24.8	55.1	10.8	9.3							

LAB #	Sample#	Wph	BpH	OM%	OM LBS/A	P LBS/A	K LBS/A	Ca LBS/A	Mg LBS/A	CEC	PERCENT SATURATION				S LBS/A	Zn LBS/A	Fe LBS/A	Mn LBS/A	Cu LBS/A	B LBS/A	Na LBS/A
											H	Ca	Mg	K							
442719	26	5.8		2.3	45	77	250	1792	166	7.5	22.6	59.6	9.2	8.5							
442720	27	6.0		2.2	44	52	235	2359	221	8.9	16.8	66.1	10.3	6.8							
442721	28	5.8		2.0	39	96	218	1930	166	7.8	21.9	62.1	8.9	7.2							
442722	29	6.0		2.4	49	73	177	2120	168	8.0	18.9	66.6	8.8	5.7							
442723	30	5.5		2.3	45	61	229	1287	138	6.4	31.3	50.4	9.0	9.2							
442724	31	5.7		2.1	42	55	406	1454	142	7.1	25.5	51.4	8.4	14.7							
442725	32	5.4		2.5	50	58	305	1435	191	7.3	28.9	49.4	11.0	10.8							
442726	33	5.6		2.3	46	71	238	1438	146	6.7	28.3	53.5	9.1	9.1							
442727	34	5.3		2.1	41	70	283	1156	171	6.5	33.7	44.3	10.9	11.1							
442728	35	5.2		2.4	49	114	251	1144	156	6.5	35.6	44.3	10.1	10.0							
442729	36	5.0		2.8	56	41	209	1343	168	7.1	35.2	47.3	9.9	7.6							
442730	37	5.9		2.4	49	47	200	2657	232	9.7	16.5	68.3	9.9	5.3							
442731	38	5.2		2.7	55	54	183	1483	196	7.3	31.5	50.8	11.2	6.4							
AVERAGE		*5.5*		*2.3*	*46*	*57*	*326*	*1483*	*175*	*7.3*	*28.5*	*50.0*	*9.9*	*11.6*							

Appendix C. Manure Sampling Procedures

C.1. Manure Sampling Procedures

Accurate determination of manure nutrients depends on accurate sampling procedures. Sampling can be approached two ways:

I. Before application
II. During application

Sampling before application lets you plan efficient nutrient use. Sampling after application only lets you verify an application rate, right or wrong.

Regardless of the sampling method, always remember to:

1. Obtain samples that are representative of the source from which they were taken.
2. Be sure collected samples are thoroughly mixed and poured immediately into lab sample container.
3. Refrigerate the sample before sending it to the lab.

C.1.1. Solid Manure (Dairy, Beef, Swine, Poultry)

Collect a composite sample by following one of the procedures listed below. A method for mixing a composite sample is to pile the manure and then shovel from the outside to the inside of the pile until well mixed. Fill a one-gallon plastic heavy-duty zip lock bag approximately one-half full with the composite sample, squeeze out excess air, close and seal. Store sample in freezer if not delivered to the laboratory immediately.

Procedure 1. Sampling while loading - *Recommended method for sampling from a stack or bedded pack.* Take at least ten samples while loading several spreader loads and combine to form one composite sample. Thoroughly mix the composite sample and take an approximately one pound sub sample using a one-gallon plastic bag. *Sampling directly from a stack or bedded pack is not recommended.*
Procedure 2. Sampling during spreading - Spread a tarp in field and catch the manure from one pass. Sample from several locations and create a composite sample. Thoroughly mix the composite sample together and take a one-pound sub sample using a one-gallon plastic bag.
Procedure 3. Sampling daily haul - Place a five-gallon bucket under the barn cleaner 4-5 times while loading a spreader. Thoroughly mix the composite sample together and take a one-pound sub sample using a one-gallon plastic bag. Repeat sampling 2-3 times over a period of time and test separately to determine variability.
Procedure 4. Sampling poultry in-house - Collect 8-10 samples from throughout the house to the depth the litter will be removed. Samples near feeders and waterers may not be indicative of the entire house and sub samples taken near here should be proportionate to their space occupied in the whole house. Mix the samples well in a five-gallon pail and take a one-pound sub sample, place it in a one-gallon zip lock bag.
Procedure 5. Sampling stockpiled litter - Take ten sub samples from different locations around the pile at least 18 inches below the surface. Mix in a five-gallon pail and place a one-pound composite sample in a gallon zip lock bag.

C.1.2. Liquid Manure - Dairy, Beef, Swine

Obtain a composite following one of the procedures listed below and thoroughly mix. Using a plunger, an up-and-down action works well for mixing liquid manure in a five-gallon bucket. Fill a one-quart plastic bottle not more than three-quarters full with the composite sample. Store sample in freezer or refrigerator if not delivered to the lab immediately.

Procedure 1. Sampling from storage- Agitate storage facility thoroughly before sampling. Collect at least five samples from the storage facility or during loading using a five-gallon bucket. Place a sub sample of the composite sample in a one-quart plastic container. *Sampling a liquid manure storage facility without proper agitation (2-4 hrs. minimum) is not recommended due to nutrient stratification, which occurs in liquid systems. If manure is sampled from a lagoon that was not properly agitated, typically the nitrogen and potassium will be more concentrated in the top liquid, while the phosphorus will be more concentrated in the bottom solids.*

Procedure 2. Sampling during application- Place buckets around field to catch manure from spreader or irrigation equipment. Combine and mix samples into one composite sub sample in a one-quart plastic container.

Procedure 3. (Recommended for storage tanks). Use a round pip with a stopper to obtain a composite sample. Open the sampler (one left with the farm) and extend vertically into the pit slowly so air can be released and manure at each depth enters the sampler. After reaching the bottom of the pit/tank, close the sampler and remove. Place end of sampler into the sample bottle and release the stopper. Repeat as necessary to fill bottle about 2/3 full (~ 1 pint).

C.1.3. Sampling Methods

C.1.3.1 Pre-application Sampling

Procedure for using a COLIWASA core sampling instrument.

1. Assemble the COLIWASA according to the instructions provided.
2. Open the bottom port of the sampler.
3. Advance the open sampler **slowly** hand over hand into the manure mass, letting the manure fill the tube.
4. Continue to advance the sampler until the sinking action of the sampler stops.
5. Gently shake the outer tube of the sampler while pulling up on the plunger rod knob to seat the plunger into the bottom port.
6. Remove the closed sampler from the manure mass.
7. Place the bottom of the sampler into a clean pail and release the captured manure.
8. Collect samples from several locations to represent the entire containment.
9. When sampling earthen structures, be sure to take samples as far from the inner dike slopes as can be reached.
10. Manure solids settle quickly, so be sure to vigorously mix the core samples collected and pour immediately into the lab sample containers.
11. Refrigerate the sample before sending it to the lab.

C.1.3.2. Pre-application Sampling

Using a COLIWASA to sample a de-watering layer.

1. Assemble the base section of the COLIWASA according to the instructions provided..
2. Close the bottom port of the sampler.
3. Advance the closed end of the sampler into the upper liquid manure layer.
4. Using the etched graduation marks on the outside of the clear tube to position the sampler midway between the top liquid level and the expected lowered liquid level.
5. Push down on the plunger knob to open the bottom port.
6. Hold the sampler at the desired depth and allow the manure to flow into the sampler.
7. Close the bottom port by pulling up on the plunger control knob.
8. Remove the filled sampler from the containment and release into a clean pail.
9. Multiple samples may be taken but are not necessary to represent the liquid layer.
10. Test the sample with an on-site Nitrogen kit or refrigerate and send the sample to a lab.

C.1.3.3. Identifying Stratification

Using the COLIWASA to identify and qualify stratified layers of manure in a containment.

1. Assemble the COLIWASA according to the instructions provided.
2. Open the bottom port of the sampler.
3. Advance the open sampler slowly hand over hand into the manure mass letting the manure fill the tube.
4. Continue to advance the sampler until the sinking action of the sampler stops.
5. Gently shake the outer tube of the sampler while pulling up on the plunger rod knob to seat the plunger into bottom port.
6. Remove the closed sampler from the manure mass.
7. Place the sampler between you and a light source.
8. Record the stratified layer locations using the etched graduations on the outside of the sampler tube.
9. Each 1" of graduation of column contains 2 oz of manure liquid.
10. The identified stratification layers can now be sampled specifically for nutrient content of each layer.
11. Advance the closed sampler to the middle of the stratified layer.
12. Push down on the plunger knob to open the bottom port of the sampler.
13. Hold the sampler at the desired depth and allow the manure to flow into the sampler.
14. Close the bottom port by pulling up on the plunger control knob.
15. Remove the filled sampler from the containment and release into a clean pail.
16. Multiple samples may be taken but are not necessary to represent the stratified layer.
17. Refrigerate the sample before sending it to the lab.

C.1.3.4. Sampling During Application

Catch sampling at point of application.

Irrigation
1. Irrigation liquid should be collected several times during the application procedure.
2. Place a clean pail in the path of the irrigation discharge.
3. Allow the irrigation equipment to move past the sample container.
4. Repeat this collection procedure several times as the containment is emptied.
5. Manure solids settle quickly, so be sure to vigorously mix the collected samples and pour immediately into the lab sample containers.
6. Refrigerate the sample before sending it to the lab.

Tank Transport and Application
1. Tank applied manure should be sampled several times during the hauling event and combined to provide a representative of the containment.
2. Collect samples from the discharge of the tank.
3. Manure solids settle quickly, so be sure to vigorously mix the collected samples and pour immediately into the lab sample containers.
4. Refrigerate the sample before sending it to the lab.

Dry Box Application
1. Manure applied by dry box should be sampled by placing a clean 8' by 8' (or larger) sheet of plastic in the path of the spreader.
2. Collect the discharged manure and mix together for a representative sample.
3. Place in sample container and refrigerate before sending to a lab.

C.1.4. Sample Identification and Delivery

Identify the sample container with information regarding the farm, animal species and date. This information should also be included on the sample information sheet along with application method, which is important in determining first year availability of nitrogen.
Keep all manure samples frozen until shipped or delivered to a laboratory. Ship early in the week (Mon.-Wed.) and avoid holidays and weekends.

C.2. Manure Analysis

The minimum analysis for Illinois is to include:
- Total Nitrogen
- Ammonia Nitrogen
- Phosphorus
- Potassium

{insert manure lab analysis}

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25-077-4323 v2

REPORT DATE **Mar 21, 2025** SEND TO **1367**
RECEIVED DATE **Mar 13, 2025**

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ISSUE DATE **Mar 21, 2025**

MURPHY BROWN OF MISSOURI LLC
BLAKE BOXLEY
17999 US HIGHWAY 65
PRINCETON MO 64673

Nutrient Land Application

For: (1367) MURPHY BROWN OF MISSOURI LLC
Lagoon Analysis

Sample ID: **4088 Mt Erie** Lab Number: **70603649** Date Sampled: **2025-03-10**

Parameter	Analysis As Received	Pounds of Nutrient AR per 1000 gal	Pounds of Nutrient AR per acre-in	Method	Reviewer-Date
Ammoniacal Nitrogen	351 mg/L	2.96	79.2	SM 4500-NH3 C-(2021)	mgn8 2025-03-21 13:50:19
Organic nitrogen	81.0 mg/L	0.7	18.3	Calculation	Auto 2025-03-21 13:50:19
Total Kjeldahl nitrogen (TKN)	432 mg/L	3.65	97.4	PAI-DK01	mgn8 2025-03-21 13:50:19
Phosphorus (as P2O5)	59.3 mg/L	0.5	13.4	EPA 200.7	Auto 2025-03-18 16:57:20
Potassium (as K2O)	530 mg/L	4.5	120	EPA 200.7	Auto 2025-03-18 16:57:20
Sulfur (total)	28.0 mg/L	0.24	6.31	EPA 200.7	trh1 2025-03-18 16:57:20
Calcium (total)	49.5 mg/L	0.42	11.2	EPA 200.7	trh1 2025-03-18 16:57:20
Magnesium (total)	13.6 mg/L	0.12	3.07	EPA 200.7	trh1 2025-03-18 16:57:20
Sodium (total)	153 mg/L	1.29	34.5	EPA 200.7	trh1 2025-03-18 16:57:20
Iron (total)	2.03 mg/L	0.02	0.46	EPA 200.7	trh1 2025-03-18 16:57:20
Manganese (total)	0.227 mg/L	---	0.05	EPA 200.7	trh1 2025-03-18 16:57:20
Zinc (total)	0.53 mg/L	---	0.12	EPA 200.7	trh1 2025-03-18 16:57:20
Copper (total)	0.29 mg/L	---	0.07	EPA 200.7	trh1 2025-03-18 16:57:20
Conductivity	5.21 mS/cm			SM 2510 B-(2011)	jsp9 2025-03-14 16:15:20
pH	7.99 S.U.			SM 4500-H+ B-(2011)	jsp9 2025-03-14 16:15:20

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered. Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered. Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations! Nitrogen availabilty will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

The result(s) issued on this report only reflect the analysis of the sample(s) submitted.

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MURPHY BROWN OF MISSOURI LLC
BLAKE BOXLEY
17999 US HIGHWAY 65
PRINCETON MO 64673

Nutrient Land Application

For: (1367) MURPHY BROWN OF MISSOURI LLC
Lagoon Analysis

Sample ID: **4091 Little Wabash** Lab Number: **70603652** Date Sampled: **2025-03-10**

Parameter	Analysis As Received	Pounds of Nutrient AR per 1000 gal	Pounds of Nutrient AR per acre-in	Method	Reviewer-Date
Ammoniacal Nitrogen	335 mg/L	2.83	75.5	SM 4500-NH3 C-(2021)	jsp9 2025-03-17 14:36:57
Organic nitrogen	74.0 mg/L	0.6	16.7	Calculation	Auto 2025-03-26 17:18:54
Total Kjeldahl nitrogen (TKN)	409 mg/L	3.46	92.2	PAI-DK01	jsp9 2025-03-17 14:36:57
Phosphorus (as P2O5)	63.0 mg/L	0.5	14.2	EPA 200.7	Auto 2025-03-26 17:18:54
Potassium (as K2O)	604 mg/L	5.1	136	EPA 200.7	Auto 2025-03-26 17:18:54
Sulfur (total)	43.6 mg/L	0.37	9.83	EPA 200.7	trh1 2025-03-21 16:33:00
Calcium (total)	64.2 mg/L	0.54	14.5	EPA 200.7	trh1 2025-03-21 16:33:00
Magnesium (total)	15.8 mg/L	0.13	3.56	EPA 200.7	trh1 2025-03-21 16:33:00
Sodium (total)	166 mg/L	1.40	37.4	EPA 200.7	trh1 2025-03-21 16:33:00
Iron (total)	0.64 mg/L	0.01	0.14	EPA 200.7	trh1 2025-03-21 16:33:00
Manganese (total)	0.129 mg/L	---	0.03	EPA 200.7	trh1 2025-03-21 16:33:00
Zinc (total)	0.15 mg/L	---	0.03	EPA 200.7	trh1 2025-03-21 16:33:00
Copper (total)	0.14 mg/L	---	0.03	EPA 200.7	trh1 2025-03-21 16:33:00
Conductivity	5.55 mS/cm			SM 2510 B-(2011)	jdb5 2025-03-26 17:18:54
pH	7.70 S.U.			SM 4500-H+ B-(2011)	jdb5 2025-03-26 17:18:54

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered. Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered. Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations! Nitrogen availabilty will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

The result(s) issued on this report only reflect the analysis of the sample(s) submitted.

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25-077-4324

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ISSUE DATE
Mar 18, 2025

MURPHY BROWN OF MISSOURI LLC
BLAKE BOXLEY
17999 US HIGHWAY 65
PRINCETON MO 64673

Nutrient Land Application

For: (1367) MURPHY BROWN OF MISSOURI LLC
Lagoon Analysis

Sample ID: **4089 Lakeview** Lab Number: **70603650** Date Sampled: **2025-03-10**

Parameter	Analysis As Received	Pounds of Nutrient AR per 1000 gal	Pounds of Nutrient AR per acre-in	Method	Reviewer-Date
Ammoniacal Nitrogen	444 mg/L	3.75	100	SM 4500-NH3 C-(2021)	jsp9 2025-03-17 14:36:44
Organic nitrogen	31.0 mg/L	0.3	7.0	Calculation	Auto 2025-03-18 16:57:25
Total Kjeldahl nitrogen (TKN)	475 mg/L	4.01	107	PAI-DK01	jsp9 2025-03-17 14:36:44
Phosphorus (as P2O5)	71.2 mg/L	0.6	16.0	EPA 200.7	Auto 2025-03-18 16:57:25
Potassium (as K2O)	601 mg/L	5.1	136	EPA 200.7	Auto 2025-03-18 16:57:25
Sulfur (total)	28.7 mg/L	0.24	6.47	EPA 200.7	trh1 2025-03-18 16:57:25
Calcium (total)	62.2 mg/L	0.53	14.0	EPA 200.7	trh1 2025-03-18 16:57:25
Magnesium (total)	13.6 mg/L	0.12	3.07	EPA 200.7	trh1 2025-03-18 16:57:25
Sodium (total)	162 mg/L	1.37	36.5	EPA 200.7	trh1 2025-03-18 16:57:25
Iron (total)	1.31 mg/L	0.01	0.30	EPA 200.7	trh1 2025-03-18 16:57:25
Manganese (total)	0.205 mg/L	---	0.05	EPA 200.7	trh1 2025-03-18 16:57:25
Zinc (total)	0.56 mg/L	---	0.13	EPA 200.7	trh1 2025-03-18 16:57:25
Copper (total)	0.40 mg/L	---	0.09	EPA 200.7	trh1 2025-03-18 16:57:25
Conductivity	5.52 mS/cm			SM 2510 B-(2011)	jsp9 2025-03-14 16:15:27
pH	8.01 S.U.			SM 4500-H+ B-(2011)	jsp9 2025-03-14 16:15:27

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered. Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered. Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations! Nitrogen availabilty will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

The result(s) issued on this report only reflect the analysis of the sample(s) submitted.

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REPORT DATE
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ISSUE DATE
Mar 21, 2025

MURPHY BROWN OF MISSOURI LLC
BLAKE BOXLEY
17999 US HIGHWAY 65
PRINCETON MO 64673

Nutrient Land Application

For: (1367) MURPHY BROWN OF MISSOURI LLC
Lagoon Analysis

Sample ID: **4092 Lakeside** Lab Number: **70603653** Date Sampled: **2025-03-10**

Parameter	Analysis As Received	Pounds of Nutrient AR per 1000 gal	Pounds of Nutrient AR per acre-in	Method	Reviewer-Date
Ammoniacal Nitrogen	270 mg/L	2.28	60.9	SM 4500-NH3 C-(2021)	jsp9 2025-03-17 15:10:36
Organic nitrogen	94.0 mg/L	0.8	21.2	Calculation	Auto 2025-03-21 16:33:18
Total Kjeldahl nitrogen (TKN)	364 mg/L	3.08	82.1	PAI-DK01	jsp9 2025-03-17 15:10:36
Phosphorus (as P2O5)	104 mg/L	0.9	23.4	EPA 200.7	Auto 2025-03-21 16:33:18
Potassium (as K2O)	955 mg/L	8.1	215	EPA 200.7	Auto 2025-03-21 16:33:18
Sulfur (total)	29.5 mg/L	0.25	6.65	EPA 200.7	trh1 2025-03-21 16:33:18
Calcium (total)	54.4 mg/L	0.46	12.3	EPA 200.7	trh1 2025-03-21 16:33:18
Magnesium (total)	16.6 mg/L	0.14	3.74	EPA 200.7	trh1 2025-03-21 16:33:18
Sodium (total)	299 mg/L	2.53	67.4	EPA 200.7	trh1 2025-03-21 16:33:18
Iron (total)	1.27 mg/L	0.01	0.29	EPA 200.7	trh1 2025-03-21 16:33:18
Manganese (total)	0.215 mg/L	---	0.05	EPA 200.7	trh1 2025-03-21 16:33:18
Zinc (total)	0.75 mg/L	0.01	0.17	EPA 200.7	trh1 2025-03-21 16:33:18
Copper (total)	0.40 mg/L	---	0.09	EPA 200.7	trh1 2025-03-21 16:33:18
Conductivity	5.78 mS/cm			SM 2510 B-(2011)	jsp9 2025-03-14 16:15:36
pH	8.07 S.U.			SM 4500-H+ B-(2011)	jsp9 2025-03-14 16:15:36

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered. Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered. Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations! Nitrogen availabilty will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

The result(s) issued on this report only reflect the analysis of the sample(s) submitted.

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ISSUE DATE **Mar 21, 2025**

MURPHY BROWN OF MISSOURI LLC
BLAKE BOXLEY
17999 US HIGHWAY 65
PRINCETON MO 64673

Nutrient Land Application

For: (1367) MURPHY BROWN OF MISSOURI LLC
Lagoon Analysis

Sample ID: **4090 Elm River** Lab Number: **70603651** Date Sampled: **2025-03-10**

Parameter	Analysis As Received	Pounds of Nutrient AR per 1000 gal	Pounds of Nutrient AR per acre-in	Method	Reviewer-Date
Ammoniacal Nitrogen	184 mg/L	1.55	41.5	SM 4500-NH3 C-(2021)	jsp9 2025-03-17 14:36:50
Organic nitrogen	33.0 mg/L	0.3	7.4	Calculation	Auto 2025-03-21 16:31:06
Total Kjeldahl nitrogen (TKN)	217 mg/L	1.83	48.9	PAI-DK01	jsp9 2025-03-17 14:36:50
Phosphorus (as P2O5)	70.5 mg/L	0.6	15.9	EPA 200.7	Auto 2025-03-21 16:31:06
Potassium (as K2O)	760 mg/L	6.4	171	EPA 200.7	Auto 2025-03-21 16:31:06
Sulfur (total)	52.9 mg/L	0.45	11.9	EPA 200.7	trh1 2025-03-21 16:31:06
Calcium (total)	44.0 mg/L	0.37	9.92	EPA 200.7	trh1 2025-03-21 16:31:06
Magnesium (total)	23.4 mg/L	0.20	5.28	EPA 200.7	trh1 2025-03-21 16:31:06
Sodium (total)	195 mg/L	1.65	44.0	EPA 200.7	trh1 2025-03-21 16:31:06
Iron (total)	0.77 mg/L	0.01	0.17	EPA 200.7	trh1 2025-03-21 16:31:06
Manganese (total)	0.098 mg/L	---	0.02	EPA 200.7	trh1 2025-03-21 16:31:06
Zinc (total)	0.09 mg/L	---	0.02	EPA 200.7	trh1 2025-03-21 16:31:06
Copper (total)	0.08 mg/L	---	0.02	EPA 200.7	trh1 2025-03-21 16:31:06
Conductivity	4.36 mS/cm			SM 2510 B-(2011)	jsp9 2025-03-14 16:15:32
pH	8.03 S.U.			SM 4500-H+ B-(2011)	jsp9 2025-03-14 16:15:32

First year availability of nitrogen is calculated based on pre-plant application with incorporation. Nitrogen available from previous year's application not considered. Total manure salts should not exceed 500 lbs/acre. Less than 500 lbs/acre if annual rainfall is less than 25 inches and/or the soil CEC is less than 12 meq/100g. Salt contributions from commercial fertilizer applications must also be considered. Soil test yearly to monitor phosphorus levels, organic matter, pH, and micronutrients. Spring soil test for residual nitrate - make accurate sidedress recommendations! Nitrogen availabilty will vary with methods of application and field conditions. The nitrogen availability values used on a manure management plan must comply with state regulations. These regulations vary from state to state.

The result(s) issued on this report only reflect the analysis of the sample(s) submitted.

Appendix D. Application Equipment Calibration

D.1. AWMFH Appendix 13A Calibrating Manure Spreading

The use of animal manure as a cropland fertilizer is economically and environmentally important. However, farmers cannot simply spread manure. They must know the nutrient quality of the manure and control the quantity and uniformity of the manure spread to ensure that the entire crop receives the nutrients.

The nutrient content of the manure is estimated from laboratory tests, and the quantity to apply is determined through computations of crop need. Farmers can receive this information from their county Extension office or other nutrient management planners. In practice, farmers often do not know exactly how much or how uniformly manure has been applied. Manure spreader calibration provides this important information.

Manure spreaders can discharge manure at varying rates, depending on forward travel speed, PTO speed, gear box settings, discharge opening, width of spread, overlap patterns, and other parameters. Calibration defines the combination of settings and travel speed needed to apply manure at a desired rate. Following is a description of the measurement methods used to determine manure application rates and ensure uniform application.

Calibration techniques

Calibration requires the measurement of the quantity of manure applied to the soil under different conditions. There are two calibration techniques: the *load area* method, which involves measuring the amount of manure in a loaded spreader and then calculating the number of spreader loads required to cover a known land area; and the *weight-area* method, which requires weighing manure spread over a small surface and computing the quantity of manure applied per acre.

The calibration method to use depends on the type of manure spreader. Soil-injection, liquid manure spreaders must be calibrated using the load-area method because
soil-injected manure cannot be collected.
Liquid manure surface applied through a tank spreader Is also best measured by the load-area method because Of the difficulty in collecting the liquid manure, but it Can be measured with the weight-area method. Solid And semisolid manure also can be measured with Either method.

Load-area calibration

Load-area calibration requires measuring the quantity of manure (tons or gallons) held in a spreader load; spreading a number of identical loads at a constant speed, spreader setting and overlap; measuring the total area of the spread; and computing the quantity of manure applied per acre. After completing the following steps, record the calculations on Worksheet 1, Manure Spreader Capacity and Worksheet 2, Load-area Calibration.

Step 1. Determine the capacity of the manure spreader. The capacity of the manure spreader must be expressed in units compatible with the units used for the nutrient analysis and recommended application rate. In some cases, the manufacturer provides the appropriate information; in other instances. The manufacturer's information must be converted.

Liquid manure. Liquid manure analysis is expressed in pounds of nutrient per gallon and the application rate is provided in gallons per acre; therefore, use gallons to express the capacity of a liquid manure spreader. Manufacturers specify liquid manure spreaders by gallons of volumetric capacity. This information can be found in the owner's manual.

Solid and semisolid manure. Solid and semisolid manure analysis is expressed in pounds of nutrient per ton and the application rate is provided in tons per acre; therefore, solid and semisolid manure spreader capacity must be expressed in tons of manure.

Solid and semisolid manures of different moisture content have different weights; thus, the weight capacity of the spreader changes according to the kind of manure held. The most direct and accurate method of determining the weight of a load of manure is to actually weigh the spreader load on farm scales. If scales are not available, use the procedure in the next section to convert the volumetric capacity of the spreader to weight capacity for the particular manure held. Record Your calculations on Worksheet 1, Manure Spreader Capacity.

Converting volumetric capacity to weight capacity. The volumetric capacity of box-type and open-tank or barrel spreaders for solid and semisolid manure is expressed in cubic feet. The manufacturer provides this information in the owner's manual. Two capacities are usually provided: heaped load (manure piled higher than the sides of the box) and struck load (the volume contained within the box). The capacity of older spreaders is sometimes designated in bushels; multiply the bushel capacity by 1.24 to determine capacity in cubic feet.

Multiply the volumetric capacity in cubic feet by the bulk density of the manure (in pounds per cubic foot) and convert it to tons. Bulk density depends on the amount of water, solids and air in the manure and can be measured by weighing a known standard volume of manure. A 5-gallon bucket has a volume of 2/3 cubic foot and can be used as a standard volume as follows:

I. Weigh the empty bucket and write the weight on the side of the bucket. This establishes the bucket's tare weight (the container weight subtracted from the gross weight to determine the weight of the manure).

2. Fill the bucket with manure from the loaded spreader. Use all the space in the bucket and pack the manure to the same density as in the spreader.

3. Weigh the full bucket and subtract the tare weight. The result is the manure weight in pounds.
4. Multiply the manure weight by 3 and then divide the product by 2. This gives the manure bulk density in pounds per cubic foot of volume.

5. Multiply the manure bulk density (in pounds per cubic foot) by the spreader capacity (in cubic feet) to get the weight of the spreader load in pounds. Divide by 2,000 to get tons.

6. Repeat this procedure at least three times. Sample the manure at different places and in different spreader loads. Average the values to obtain a representative composite of the manure.

Step 2. Spread manure on a selected field. Spread at least three full loads of manure on a field. Maintain the same speed and spreader setting for each load. Choose spreader path spacing to achieve what appears to be the most uniform coverage. Try to spread in a rectangle or square for easy calculation.

Step 3. Measure the area of the spread. Place flags at the corners of the spread area. Measure the width and length between the flags in feet using a measuring tape, measuring wheel, or consistent pace. Multiply the length by the width and divide that product by 43,560 to determine the area in acres.

Step 4. Compute the application rate. Multiply the number of loads spread by the number of tons or gallons per load to determine the total amount of manure applied to the area. Divide the total amount of manure by the area of the spread in acres to determine the application rate in tons per acre or gallons per acre.

The load-area method should be repeated at different speeds and spreader settings until the desired application rate is obtained. Maintain a record of the application rates at different settings to avoid recalibrating the spreader each season.

Weight-area calibration

Spreader calibration by weight-area requires laying out a ground sheet of known dimensions on the soil; spreading manure over it at a selected speed, spreader setting and overlap; retrieving the ground sheet and the manure deposited on it; weighing the manure retrieved; and computing the quantity of manure applied per acre. The weight-area method does not require measuring the amount of manure in the spreader. As you complete the following steps, record your calculations on Worksheet 3. Weight-Area
Calibration.

Step 1. Select a manure collection surface. A ground sheet can be a cloth or plastic (6 mil) sheet of at least 100 square feet (10 feet by 10 feet) in area. Multiply the length of the sheet by the width to determine its area in square feet.

Liquid manure may run off a flat ground sheet; shallow plastic or metal pans are more useful. The pans should have a minimum area of 1 square foot each. Multiply the length of one pan by its width to determine the area of one pan. Multiply the area of one pan by the number of pans used to determine the total collection area in square feet. For handling and cleaning convenience, place the pan inside a plastic garbage bag for each field test so that the bag and manure can be discarded leaving the pan clean. Six or more pans are necessary for a test.

Weigh the ground sheet or pan and record the weights for use as a tare weight in calculations. Dirty sheets and pans can be used for multiple tests only after major manure deposits have been removed. Dirty sheets and pans must be weighed before each test so that any manure residue is included in the new tare weight.

Step 2. Secure the collection surface in the field. Lay the ground sheet out fully extended. Lay the sheet on the ground so that as the sheet is removed from the field the manure applied over the surface can be collected easily in its folds. If dirty sheets are being used for additional tests turn the dirty side up so that any manure residue included in the tare weight is not lost. Weights of stone metal or earth clods will be required to hold the ground sheet on the soil surface. A small breeze can easily fold the sheet or tractor wheels and forceful applications of manure can move it.

Pans are not as easily affected by wind, but may be moved by forceful streams from side outlet manure spreaders. Evenly space pans in a row perpendicular to the spreader's path. Pans are easily crushed by tires; allow for wheel tracks and adhere to the path provided. Placing flags at designated wheel tracks helps Avoid pan damage.

Step 3. Spread manure over the collection area. Spread manure over and near the ground sheet or pans in a manner that best duplicates the spreading pattern you plan for the field. With rear outlet spreaders, make three passes: the first pass directly over the center of the collection area and the remaining two passes on the opposite sides of the first pass with an overlap. With side outlet spreaders, locate a first pass off of, but along one edge of, the collection area. Follow with subsequent passes farther away from the collection area and at the intended overlap until manure no longer reaches the surface.

In all cases. start spreading manure far enough before the collection area to ensure that the spreader is functioning. If a ground sheet is folded or a pan is moved during a spread pass, investigate its condition before continuing with the test. Folded edges can be straightened without major loss of accuracy. If more than one-fourth of the surface has moved and did not receive manure, the test should be conducted again with a newly weighed sheet. Pans that have been crushed but retain the applied manure can still be used. Return moved pans to their original position.

Step 4. Collect and weigh the manure. Remove weights used to hold the ground sheet in place. Fold the ground sheet and manure in short sections from all sides and corners inward to avoid losing any manure. A 10-foot by 10-foot sheet folded with wet manure may weigh as much as 150 pounds and tends to slip around when carried; place it in a feed tub or other container for easier handling.

Pans are easy to handle and will usually weigh less than 4 pounds each. Careful handling is required to avoid spilling liquid manure.

Select scales capable of accurately weighing the type and quantity of manure collected. A single pan may collect from 2 ounces to 4 pounds and can be weighed with a kitchen scale. A ground sheet may collect from 10 to 50 pounds with application rates of less than 10 tons per acre. A ground sheet can be weighed with spring-tension or milk scales. A ground sheet with application rates greater than 10 tons per acre will require a platform balance with a capacity of 50 to 150 pounds or greater.

The weight indicated on the scale will include the tare weight of the ground sheet or pan as well as that of any container used to hold the ground sheet or pan during weighing. Subtract the tare weights from the total weight to determine the net weight of the manure collected.

Step 5. Compute the application rate. The number of steps and the procedure used to compute the application rate depend on the method of collection and the units per acre.

Ground sheet to tons per acre. Divide the net pounds of manure collected by the area of the ground sheet to obtain the manure application rate in pounds of manure per square foot. Multiply the result by 43,560 and then divide by 2,000 to convert to tons per acre.

Pans to tons per acre. Add the net weights of manure collected in individual pans to determine the total weight of manure collected. Divide the total manure weight by the total collection area to obtain pounds of manure per square foot. Multiply the result by 43,560 and divide by 2000 to obtain tons per acre.

Pans to gallons per acre. If working with weight from pans to determine liquid applications in gallons per acre, make an additional measurement to calculate the weight per gallon of manure. Fill a 5-gallon bucket with liquid manure of the same consistency of that applied. Weigh the bucket of manure and subtract the tare weight of the bucket to determine the net weight of 5 gallons of manure. Divide the result by 5 to determine the weight in pounds per gallon. Follow the procedure for "Pans to tons per acre" through obtaining pounds of manure per square foot. Then multiply by 43,560 and divide by pounds per gallon to obtain Gallons per acre.

Uniformity testing

The results of nonuniform manure spreading are often indicated by the lush, green growth within the spreader paths and the not-so-lush growth between spreader paths. This occurs because more manure was deposited in and near the spreader path than farther away from the path. Uniform application can be obtained by adjusting the application overlap. The amount of overlap necessary can be determined by a uniformity test. As you complete the steps in this uniformity test, record your calculations on Worksheet 4, Uniformity Testing.

The test procedure is identical to the weight-area calibration method, using pans or a series of 24-inch by 24-inch ground sheet sheets laid out with equal spacing across two spreader path widths. After the manure is applied, each pan or sheet is compared with the others. Uniformity can be recorded when manure is spread to determine the application rate.

If all containers collect about the same amount of manure during a test, the application is uniform; if some collect more than others, the overlap should be adjusted. High application in the center of paths and low application between paths indicate a need to increase the overlap by decreasing the path spacing. Higher application between paths than within paths indicates a need to decrease overlap by increasing path spacing.

Shortcuts

Developing a range of application rates for different manure spreader speeds can be simplified if the spreader is PTO-powered and the tractor or truck is equipped with a groundspeed indicator. Conduct one test at low groundspeed and one at high groundspeed, maintaining the same spreader setting and PTO speed for both tests. Plot these two application rates on a graph of groundspeed versus application and draw a straight line connecting the two points. The application rate available at intermediate groundspeeds can then be estimated from the graph. Conducting additional high-low tests at different settings or at different PTO speeds will define a full range of available application rates.

If solid or semisolid manure changes moisture content from season to season, the weight capacity in the spreader and the application rate by weight will change. Adjust previously calibrated spreader conditions for these changes by determining the bulk density of the new manure. To estimate the field application rate for the new manure for a particular speed and spreader setting, multiply the old application rate by the new bulk density and then divide by the old bulk density.
This calculation eliminates the need to repeat
The field test every time manure properties change.

Summary

By measuring the application rate and uniformity of manure spreading, a farmer can be sure of the amount of manure nutrients applied to a crop. This measurement, called calibration, can be accomplished with a little time and a few dollars. For further information, contact your county Extension office.

Source—Adapted from Calibrating Manure Spreaders, Fact Sheet 419, Cooperative Extension Service, University of Maryland System, H.L. Brodie, extension agricultural engineer, and G.L. Smith, extension agricultural engineer, Department of Agricultural Engineering, University of Maryland at College Park, Published 1985-86, revised 1990-91.

D.2. AWMFH Appendix 13A – Worksheet 13A-1

Worksheet 13A-1—Manure Spreader Capacity

A. Description of spreader.

Manufacturer ______________________ Model ______________________

Type: ❑ box ❑ open-tank ❑ liquid-tank

Capacity: This information is available from your dealer or owner's manual.

Older models: bushels x 1.24 = cubic feet

Box or open-tank: ________ ft^3 struck load ________ ft^3 heaped load

Liquid-tank: ________ gal

B. For open-tank and box spreaders, determine the pounds per cubic foot of manure and the weight capacity of the spreader.

Type of manure: ❑ solid ❑ semisolid

	Trial 1	Trial 2	Trial 3	
1. Determine manure density using a 5-gallon bucket.				
a. Empty bucket weight or tare weight	______	______	______	lb
b. Bucket filled with manure	______	______	______	lb
c. Net weight of manure (b – a)	______	______	______	lb
d. Manure density [(c x 3) ÷ 2]	______	______	______	lb/ft^3
e. Average of three trials	______	lb/ft^3		

2. Weight capacity of the spreader.	Struck load	Heaped load
Spreader capacity	______ ft^3	______ ft^3
x	x	x
Manure density	______ lb/ft^3	______ lb/ft^3
=	=	=
Load weight	______ lb	______ lb
÷	÷	÷
2,000	______ tons	______ tons

D.3. AWMFH Appendix 13A – Worksheet 13A-2

Worksheet 13A-2—Load-Area Calibration

Liquid-Tank Spreaders (Liquid Manure)

1. Determine the capacity of the manure spreader. ________ gal
2. Spread at least three full loads at the desired speed, spreader setting and overlap.
3. Measure the area of the spread.
   a. Spread manure area width ________ ft
   b. Spread manure area length ________ ft
   c. Spread area (a x b) ________ ft^2
   d. Spread area in acres (c ÷ 43,560) ________ acres
4. Compute the application rate.
   e. Number of loads spread
   f. Capacity per load ________ gal
   g. Total manure spread (e x f) ________ gal
   h. Application rate (g ÷ d) ________ gal/acre

Box and Open-Tank Spreaders (Solid and Semisolid Manure)

1. Determine the capacity of the manure spreader. ________ tons
2. Spread at least three full loads at the desired speed, spreader setting and overlap.
3. Measure the area of the spread.
   a. Spread manure area width ________ ft
   b. Spread manure area length ________ ft
   c. Spread area (a x b) ________ ft^2
   d. Spread area in acres (c ÷ 43,560) ________ acres
4. Compute the application rate.
   e. Number of loads spread ________
   f. Capacity per load ________ tons
   g. Total manure spread (e x f) ________ tons
   h. Application rate (g ÷ d) ________ tons/acre

Nutrient application = tons/acre x pounds of nutrient per ton
or gallons/acre x pounds of nutrient per gallon

D.4. AWMFH Appendix 13A – Worksheet 13A-3

Worksheet 13A-3—Weight-Area Calibration

1. Select a manure collection surface.
   a. Determine collection area
      Ground sheet:
         width ________ ft x length ________ ft = area ________ ft²
      Pans:
         pan width ________ inch x pan length ________ inch ÷ 144 = pan area ________ ft²
         pan area ________ x number of pans ________ = collection area ________ ft²

2. Secure ground sheet or pans.

3. Spread manure over the collection area.

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Forward speed, gear or throttle setting	________	________	________	________	________
PTO speed	________	________	________	________	________
Spreader setting	________	________	________	________	________

4. Collect and weigh the manure and compute the application rate.

a. Tare weight of sheet or pan andweighing container	________	________	________	________	________	lb
b. Gross weight of sheet or pan, collected manure and weighing container	________	________	________	________	________	lb
c. Net weight of manure (b – a)	________	________	________	________	________	lb
d. Area of sheet or pans	________	________	________	________	________	ft²
e. Application rate (c ÷ d)	________	________	________	________	________	lb/ft²
Ground sheet or pans to tons per acre.						
f. Application rate [(e x 43,560) ÷ 2,000]	________	________	________	________	________	ton/ac
Pans to gallons per acre.						
g. Tare weight of a 5-gallon bucket	________	________	________	________	________	lb
h. Weight of a 5-gallon bucket full of manure	________	________	________	________	________	lb
i. Net weight of 1 gallon of manure [(h - g) - 5]	________	________	________	________	________	lb/gal
j. Application rate [(e x 43,560) ÷ g]	________	________	________	________	________	gal/ac

Nutrient application = tons/acre x pounds of nutrient per ton
or gallons/acre x pounds of nutrient per gallon.

D.5. AWMFH Appendix 13A – Worksheet 13A-4

Worksheet 13A-4—Uniformity Testing

1. Layout a line of small ground sheet sheets or pans of equal size, equally spaced across two spreader path widths
   a. Determine the pan or sheet area.

      width ________ inch x length ________ inch ÷ 144 = area ________ ft^2

2. Spread manure over the collection area.

   Forward speed, gear or throttle setting ________

   PTO speed ________

   Spreader setting ________

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	
a. Tare weight of sheet or pan and weighing container	______	______	______	______	______	______	______	lb
b. Gross weight of sheet or pan, collected manure and weighing container	______	______	______	______	______	______	______	lb
c. Net weight of manure (b – a)	______	______	______	______	______	______	______	lb
d. Area of sheet or pans	______	______	______	______	______	______	______	ft^2
e. Application rate (c ÷ d)	______	______	______	______	______	______	______	lb/ft^2

Uniformity is achieved when all pans or sheets collect the same amount of manure. To improve uniformity, adjust spreader paths to increase or decrease overlap.

Published 1985-86
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(210-vi-AWMFH, May 1996)

Appendix E. Record Keeping Forms

E.1. Operation and Maintenance Record
E.2. Fertilizer and Manure Application Record
E.3. Crops Record
E.4. Crop Yield Annual Summary
E.5. Daily Application Log for Solid Manure
E.6. Daily Application Log for Liquid Manure
E.7. Annual Manure Application Summary
E.8. Manure Containment Liquid Level & Berm Inspection Record
E.9. Manure Application – Load Record Log
E.10. Mortality Management Record
E.11. Composter Record

Summary of Maps You Have Available

Form 1-A

						Other information I have for this field.					
Map #	County	Field name	Acreage Total	Township	Range	Quarter-quadrangle (if known)	Digital orthophoto	Topographical	Yield monitor	Other (plat, etc.)	Lease agreement
							Indicate with an "X"				

Step 3: Facility/Production Area Information

Form 3-A Instructions: Facility Working and Design Capacity

Fill in the following information about your livestock: species, stage of production, general size, number of animals and number of animal units at the facility.

1. **Number of Form 3-A's to use for your facility?**—In most cases one form can be used, but if this plan includes livestock at two or more separate livestock facilities, a separate page should be used for each facility. Use an additional form if in doubt.

2. **Column A**—Identify in this column on **Form** 3-A the number of days per year (for each species and stage of growth) livestock are contributing manure to your manure storages.

3. **Column C**—Write in the average weight of your livestock (for each species and stage of growth).

4. **Column E**—Either mark the appropriate box for the day and month you are using to report your inventory (number of head), or mark the box for "average" for each species and stage of growth.

5. **Column F**—Identify your maximum inventory numbers (number of head) or the percentage variation during the year from Column E for each species and stage of growth.

6. **Column G**—To determine your CNMP animal units multiply Column D times Column E, then divide by 1,000 pounds for each species and stage of growth.

7. **LMFA Animal Unit Table**—
   - Design capacity column—For each species and stage of growth identify the design capacity of their buildings or feedlots. Use additional forms if necessary.
   - Total Animal Units column—Compute the product of the multiplier and the design capacity for each species and stage of growth, and write the results in this column.

ORGANIZATION TIPS:
- Place this information in the producer manual in the section called *Archive (Yearly Update)—base of the Pyramid.*
- Update this section when changes occur; do not wait until your annual plan update.

Facility/Production Area Map and Item List

1. Provide a detailed map (or sketch) of the facility/production area. A sample map is included in Appendix A. As you complete the following forms in Step 3, you will identify on your map many of the items listed below if they apply to your facility. Make sure the items below in bold are marked on your map also (if applicable). This can be accomplished by using either a sketch or marking on an aerial map.
   - A topographic map of the facility/production area must also be provided. You may want to make a separate topographic map to show detail more clearly, or you can combine the topographic lines and the facility features on one map.
   - You should also include a copy of your facility/production area map with your Emergency Response Plan. For clarity in the ER Plan map, you might want to use a copy of your facility/production area map without all the items marked on it that are required in Step 3.

Animal Structures and Feedlots
Confinement buildings
Feedlots
Milking parlor
Materials and materials handling
Chemical storages
Composting sites
Fuel storages
Grain bins
Hazardous materials other than farm chemicals
Lagoons and holding ponds
Manure pipes (show direction of flow)
Manure re-charge/recycle pipes (show direction of flow)
Manure stacking areas
Manure storages
Mortality sheds
Septic systems
Settling basins
Silos
Storage buildings
Vegetative filters[§]
Wastewater drains and lines
Fresh water
Filter Strips[H]
Ponds
Storm water drains and lines
Wells
Other fresh water
Roads
Access roads
Roads
Other structures
Facility office
Residences
Other structures

[H]Filter strips are used to remove sediment from storm water before it enters streams or other waters of the State.

[§]Vegetative filters are used to remove nutrients from feedlot runoff and provide infiltration of water into the filter soil itself except in storm events exceeding the vegetative filter strip's design storm.

Form 3-B Instructions: Storm Water Pollution Prevention Plan

1. Use the map(s) (aerial and topographic or contour) collected above to identify the direction(s) of water drainage for your facility/production area. This will be your storm water prevention plan map.
2. Identify on this map any storm water contributing areas.
3. Using this map, identify the storm water pollution prevention structures your facility utilizes in this plan.
    - Mark the checkbox under "Y" if you have the structure listed, and then using the Map Legend code, identify the location of those structures on your storm water pollution prevention plan map.
    - If your facility could utilize an item on **Form 3-B** but does not, mark the checkbox under "N."
    - If your facility *could not* utilize an item on **Form 3-B**, mark the checkbox under "NA."

Form 3-C Instructions: Facility/Production Area Storm Water Pollution Prevention Plan

Using **Form 3-C** list the storm water pollution prevention best management practices that will be utilized in this plan and or are already being utilized.

- Mark the checkbox under "Y" if you are utilizing those practices. If you have any of the last four items, use the Map Legend code to identify the location of those items on your storm water pollution prevention plan map.
- If your facility could utilize an item on **Form 3-C** but does not, mark the checkbox under "N."
- If your facility does not store or contain any hazardous materials or chemicals or have fueling areas (last 4 items) mark the checkbox under "NA."

1. If there is new construction that involves disturbing more than one acre of land, include a copy of your NPDES Storm Water Permit.
2. Use additional pages, as necessary, to describe any aspect of your storm water pollution prevention plan not adequately described by **Forms 3-B and 3-C**.

ORGANIZATION TIPS:

- Place this information in the producer manual in the section called *Facility Information—Storm water plan, in the Archive (Yearly Update)—base of the Pyramid.*
- Update this section when changes occur; do not wait until your annual plan update.

Forms 3-D, E, F and G Instructions:

Mortality Disposal Method(s) and Pollution Prevention Plan

1. Describe your mortality disposal process using the **Form 3-D** checklist.
2. Mark the location of your mortality site on your storm water pollution prevention plan map.
3. Using **Form 3-E**, identify the mortality discharge prevention best management practices your facility utilizes in this plan.
   - Mark the checkbox under "Y" if you utilize that practice, and then using the Map Legend code, identify the location of those practices on your storm water pollution prevention plan map.
   - If your facility could utilize an item on **Form 3-B** that is connected with your facilities disposal method but does not, mark the checkbox under "N."
   - Mark the checkbox under "NA" if a practice is not connected with a mortality disposal method your facility utilizes; for example, check the NA box for incinerators if you compost.
4. Use the Mortality records worksheets (**Form 3-F and Form 3-G**) to record details of the disposal of mortalities. If you have computer records that quantify your mortalities on a monthly or annual basis, make a copy to include in this plan, but be sure to identify either the number of head or average size (weight).
5. Use additional pages, as necessary, to describe any aspect of your mortality management plan not adequately described by **Form 3-D**.
6. For reference, the Workbook CD contains a copy of the Illinois Dead Animal Disposal Act.

ORGANIZATION TIPS:

- Place this information in the producer manual in the section called *Archive (Yearly Update)—base of the Pyramid.*
- Update this section when changes occur; do not wait until your annual plan update.

Form 3-H Instructions:
Chemical Waste and Raw Material Discharge Prevention Plan

1. Using **Form 3-H**, identify the chemical wastes and raw materials discharge prevention best management practices your facility utilizes in this plan.
2. Mark the checkbox under "Y" if you utilize that practice, and then using the Map Legend code, identify the location of those practices on your storm water pollution prevention plan map.
3. If your facility could utilize an item on **Form 3-H** that is connected with your facilities disposal method but does not, mark the checkbox under "N."
4. Mark the checkbox under "NA" if a practice refers to something not kept at your facility, e.g. fuel, chemicals, silage, milk, etc.

Form 3-I Instructions: Use Exclusion (Fencing from Surface Water)

1. Using **Form 3-I**, identify the fencing practices your facility utilizes in this plan to control livestock access to any surface waters of the State that run through the facility (for example, a stream running through a feedlot).
   - Mark the checkbox under "Y" if you utilize that fencing practice, and then using the Map Legend code, identify the location of those practices on your storm water pollution prevention plan map.
   - If your facility could utilize an item on **Form 3-I** but does not, mark the checkbox under "N." Only mark "No" if you have livestock with access to surface water, but you do not use that specific practice.
   - If your facility is total indoor confinement and fencing from surface water is not an issue, then mark all the checkboxes under "NA."

Form 3-J Instructions: Temporary Manure Stack Discharge Prevention

1. Using **Form 3-J**, identify the temporary manure stack discharge prevention practices your facility utilizes in this plan.
   - Mark the checkbox under "Y" if you utilize that practice, and then using the Map Legend code, identify the location of those practices on your storm water pollution prevention plan map.
   - If your facility utilizes temporary manure stacks, but you do not use some of the items listed on **Form 3-J**, mark the checkbox under "N."
   - If your facility never temporarily stores/stacks manure outside and as a result discharge from such stacks does not occur, then mark all the checkboxes under "NA."

Storm Water Pollution Prevention Plan

Form 3-B

Y	N	NA	Map Legend*	Physical Structures
☐	☐	☐	3B-1	**Collection basins**—Permanent structures in which large spills or contaminated storm water is contained and stored before cleanup or treatment. Collection basins are designed to receive spills, leaks, etc., and to prevent pollutants from being released into the environment. Collection basins can receive and contain materials from many locations across a facility.
☐	☐	☐	3B-2	**Curbing**—A barrier that surrounds an area of concern. Unlike diking, curbing is unable to contain large spills and is usually implemented on a small-scale basis. However, curbing is common at many facilities and in small areas where liquids are handled and transferred.
☐	☐	☐	3B-3	**Containment diking**—Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking can be used at any facility, but is most common for controlling large spills or releases from liquid storage and transfer areas. Diking can provide one of the best protective measures against the contamination of storm water because it surrounds the area of concern and keeps spilled materials separated from the storm water outside of the diked area.
☐	☐	☐	3B-4	**Diversions**—A diversion is a channel constructed across the slope, generally with a supporting ridge on the lower side, for the purpose of changing the direction of flow of storm water.
☐	☐	☐	3B-5	**Dry extended detention ponds**—Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the storm water runoff from a water quality design storm for some minimum time (e.g., 24 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. However, they are often designed with small pools at the inlet and outlet of the basin. They can also be used to provide flood control by including additional flood detention storage.
☐	☐	☐	3B-6	**Wet ponds**—Wet ponds (a.k.a. storm water ponds, retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season). Ponds treat incoming storm water runoff by settling and algal uptake. The primary removal mechanism is settling as storm water runoff resides in this pool, and pollutant uptake, particularly of nutrients, also occurs through biological activity in the pond.
☐	☐	☐	3B-7	**Infiltration basin**—An infiltration basin is a shallow impoundment that is designed to infiltrate storm water into the ground water. This practice is believed to have a high pollutant removal efficiency and can help recharge the ground water, thus restoring low flows to stream systems.
☐	☐	☐	3B-8	**Infiltration trench**—An infiltration trench (a.k.a. infiltration galley) is a rock-filled trench with no outlet that receives storm water runoff. Storm water runoff passes through some combination of pretreatment measures, such as a swale and detention basin, and into the trench. There, runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. The primary pollutant removal mechanism of this practice is filtering through the soil.
☐	☐	☐	3B-9	**Storm water wetland**—Storm water wetlands (a.k.a. constructed wetlands) are structural practices similar to wet ponds that incorporate wetland plants into the design. As storm water runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake within the practice. Storm water wetlands are designed specifically for the purpose of treating storm water runoff, and typically have less biodiversity than natural wetlands in terms of both plant and animal life.

☐	☐	☐	3B-10	**Grassed waterways/swales**—A series of vegetated, open channel management practices designed specifically to treat and attenuate storm water runoff for a specified water quality volume. As storm water runoff flows through these channels, it is treated through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Variations of the grassed swale include the grassed channel, dry swale, and wet swale.
☐	☐	☐	3B-11	**Grassed filter strip**—Grassed filter strips (vegetated filter strips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. Filter strips function by slowing runoff velocities and filtering out sediment and other pollutants, and by providing some infiltration into underlying soils.
☐	☐	☐	3B-12	**Catch basin**—A catch basin (a.k.a. storm drain inlet, curb inlet) is an inlet to the storm drain system that typically includes a grate or curb inlet and a sump to capture sediment, debris, and associated pollutants. They are also used in combined sewer overflow (CSO) watersheds to capture floatables and settle some solids. Catch basins act as pretreatment for other treatment practices by capturing large sediments.
☐	☐	☐	3B-13	**In-line storage**—In-line storage refers to a number of practices designed to use the storage within the storm drain system to detain flows. Storage is achieved by placing devices in the storm drain system to restrict the rate of flow. Devices can slow the rate of flow by backing up flow, as in the case of a dam or weir, or through the use of vortex valves, devices that reduce flow rates by creating a helical flow path in the structure.
☐	☐	☐	3B-14	**Other practices**

* Mark the map legend codes on facility/production area maps where appropriate.

Facility/Production Area Storm Water Pollution Prevention Plan

Form 3-C

Mark those BMP's listed below that are applicable to any part of your operation.

Y	N	NA	Map Legend	Management/Operational Practices
				Diversions (Terrace–like structures can also function as diversions.)
☐	☐	☐		Temporary diversions are used only where the drainage area is less than 5 acres.
☐	☐	☐		Diversions that are part of a pollution abatement system have a minimum capacity for the peak discharge from a 10-year frequency, 24-hour duration storm.
☐	☐	☐		Diversions designed to protect areas such as buildings, roads, and animal waste management systems have a minimum capacity for the peak discharge from a storm frequency consistent with the hazard involved but not less than a 25-year frequency, 24-hour duration storm. Freeboard is not less than 0.3 ft.
☐	☐	☐		The location of a diversion and outlet is in compliance with applicable state drainage and water conveyance laws.** Diversions do not outlet on public roads, highways, or other public utility, or the written approval of the appropriate authorities has been obtained.
☐	☐	☐		Where movement of sediment into the channel can be a problem, the design includes extra capacity for sediment or periodic removal; and where applicable, such sediment removal is outlined in the operation and maintenance plan.
☐	☐	☐		The outlet conveys runoff to a point where outflow will not cause damage.
☐	☐	☐		Periodic inspections, especially immediately following significant storms, are performed. Damaged components of the diversion are promptly repaired or replaced as necessary.
☐	☐	☐		Diversion capacity, ridge height, and outlet elevations are maintained, especially where high sediment yielding areas are in the drainage area above the diversion.
☐	☐	☐		Each inlet for underground outlets is kept clean and sediment buildup redistributed so that the inlet is at the lowest point.
☐	☐	☐		Sediment is redistributed as necessary to maintain the capacity of the diversion.
☐	☐	☐		Vegetation on diversions is maintained and trees and brush controlled by hand, chemical and/or mechanical means.
☐	☐	☐		Machinery is kept away from steep sloped ridges. Equipment operators are informed of all potential hazards.
☐	☐	☐	3C-1	**Hazardous materials storage**—Proper storage of hazardous materials. Practices such as covering hazardous materials, or even storing them properly, can have dramatic impacts.
☐	☐	☐	3C-2	**Fueling areas**—Absorbent used for fueling areas will be packaged in small bags for convenient use and small drums will be available for storage. Absorbent materials will not be washed down the floor drain or into the storm sewer.

☐	☐	☐	3C-3	**Chemical spills**—Emergency spill containment and cleanup kits will be located at the facility site. The contents of the kit will be appropriate to the type and quantities of chemical or goods stored at the facility.
☐	☐	☐	3C-4	**Other practices** (describe)

** See *Illinois Drainage Law Part 1* on the Workbook CD for details on landowner rights and responsibilities regarding drainage.

Diversion - NRCS Practice Standard Code 362, Roof Runoff Structure - NRCS Practice Standard Code 558

Mortality Disposal Operations

Form 3-D

☐ If a rendering service is used, completely describe how often they pick up, where mortalities are kept until pick up, security, etc. **Use Forms 3-F and 3-G** to record mortalities.

☐ If mortalities are composted, completely describe (how constructed - dimensions, roof, floor, material used, etc.) composting operation and the facilities operation and maintenance, including daily activities, temperature readings, approximate pounds of mortalities per month, location of compost site, carbon source, recipe, etc. **Use Forms 3-F and 3-G** to record mortalities.

☐ If an incinerator is used, provide a complete description of the operation and maintenance of the incinerator, including approximate pounds per month incinerated and location of the incinerator. Also include a copy of the IEPA incinerator approval, etc. **Use Forms 3-F and 3-G** to record mortalities.

☐ If burial is used provide a complete description of procedures including location of past and current burial sites (map showing the sites should be included), how many pounds are buried at each site, field drainage, water table, etc. **Use Forms 3-F and 3-G** to record mortalities.

Mortality Discharge Prevention Best Management Practices

Form 3-E

Mark those BMP's listed below that are applicable to any part of your operation.

Y	N	NA	Map Legend*	Practices
☐	☐	☐	3E-1	**Location**—The facility is down gradient (slope) from all springs and/or wells.
☐	☐	☐		**Location**—The animal mortality facility is located outside the 100-year floodplain.
☐	☐	☐		**Location**—Due to site restrictions, the facility is within a floodplain, and the facility is protected from inundation or damage.
☐	☐	☐		**Location**—The facility is located as close to the source of mortality as practical, considering bio-security issues and the need to keep the facility out of sight of the general public.
☐	☐	☐		**Liner**—Seepage from mortality facilities could create a potential water quality problem, and a clay liner or other acceptable liner technology is used beneath the facility to contain seepage.
☐	☐	☐	3E-2	**Freezers**—Freezer units are sized to accommodate the normal maximum volume of mortality to be expected in the interval between emptying. Freezer volume includes the expected mortality rate of the animal, the period of time between emptying where mortality is given on a per day basis, the average weight of the animal between emptying, and a conversion factor for weight to volume. Capacity calculations are supported by a removal schedule supplied by an integrator or approved vendor.
☐	☐	☐	3E-3	**Incinerators**—Incinerator is dual burning Type 4 (human and animal remains) approved for use within the state. Permit for operation (IEPA Bureau of Air) is on file at the site.
☐	☐	☐		**Incinerators**—Minimum incinerator capacity is based on the average daily weight of animal mortality and the length of time the incinerator will be operated each day.
☐	☐	☐		**Incinerators**—Incineration ash is properly handled so as not to cause pollution.
☐	☐	☐		**Incinerators**—Ground under incinerator is managed to prevent storm water runoff, either by berms or containment of that runoff.
☐	☐	☐		**Runoff**—All mortality areas are managed to prevent storm water runoff, either by using berms or containment of that runoff.
☐	☐	☐		**Roofs**—Facility has a roof to manage storm water and prevent storm water from entering mortality management area.
☐	☐	☐		**Inspection and maintenance**—At each operation or use, the animal mortality facility is inspected to note any maintenance needs or indicators of operation problems.
☐	☐	☐		**Biosecurity**—Biosecurity concerns are addressed in all aspects of planning, installation, and operation and maintenance of the animal mortality facility.
☐	☐	☐	3E-4	**Visual screens**—Vegetative screens, topography, and buildings are used to shield the animal disposal facility from public view and to minimize visual impact.
☐	☐	☐	3E-5	**Safety**—Safety devices such as fencing, warning signs, and freezer locks are in place where appropriate.
☐	☐	☐	3E-6	**Other (list)**

* Mark the map legend codes on facility/production area maps where appropriate.

Mortality Disposal—Record Sheet

Form 3-F

(Use a separate sheet for each month)

Month/Year: __________

☐ Compost* ☐ Rendered ☐ Incinerated ☐ Burial** ☐ Other __________

Date	Number of Head or Ave. Size (Weight)		Total
Monthly Total			

*Composting—include sample information (N, P, and K) if spread on fields.

** Burial Method—include a map showing burial locations and # of pounds buried at each site.

Yearly Mortality Summary Table

Form 3-G

Year: __________

	Number	Size (Weight)	Total
Rendered			
Composted*			
Incinerated			
Buried**			
Other			
Total			

* Include sample information (N, P, and K) if spread on fields
** Include a map showing burial locations and number of pounds buried at each site.

Chemical Wastes and Raw Materials Discharge Prevention

Form 3-H

Mark those BMP's listed below that are applicable for your operation.

Y	N	NA	Map Legend*	Construction and Post-Construction Storm Water Pollution Prevention Plan
			3H-1	Storage containers for gasoline, diesel fuel, kerosene, and other liquid fuels are free of leaks.
			3H-2	Vehicle and portable container filling areas near the fuel storage containers are constructed so as to allow immediate containment and cleanup of fuel spills.
			3H-3	Specific areas are designated for equipment maintenance and repair, and the areas include appropriate waste receptacles for spent oils, gasoline, grease and solvents. Housekeeping plan includes regular collection and disposal schedules.
				Storage areas are protected from storm water in accordance with the manufacturers' guidelines for the following materials:
			3H-4	• Oils, grease, and solvents
			3H-5	• Paints, stains, brush cleaners and similar materials
			3H-6	• Crop protection chemicals (herbicides, pesticides)
			3H-7	• Fertilizers (liquid, dry bulk, dry bagged)
			3H-8	• Animal treatment non-medicinal (disinfectants, foot baths, dips)
			3H-9	• Cleaning and sanitizing materials
			3H-10	• Pharmaceuticals
			3H-11	• Acids or other potentially toxic water pollutants (list ________________)
				The following sites are covered (e.g. roofed or other rainproof covering) or are constructed so as to drain to regularly maintained sediment control devices designed to accommodate such discharges:
			3H-12	• Materials handling equipment storage sites. *Example: Bucket loader used for silage and commodities loading, mixing. Show where loader is stored, and if stored outside, what happens to storm water contaminated with raw materials.*
			3H-13	• Shipping and receiving areas. *Example: a concrete apron outside the shed has storm water diverted around it and water off the apron goes into a grassed infiltration area.*
			3H-14	• Storage for raw materials used in the manufacture of concrete including sand, aggregate, cement, water and admixtures
			3H-15	• Storage for other raw construction materials (list __________)
			3H-16	• Storage for other waste generated off-site

				The following raw materials or products are handled at the facility and are covered (e.g. roofed or other rainproof covering) or storages are constructed so as to drain contaminated storm water to appropriate containment areas:
			3H-17	• Feed
			3H-18	• Whey
			3H-19	• Silage leachate. *Example: Silage leachate is directed to a temporary storage tank that is emptied as necessary and contents land-applied.*
			3H-20	• Other leachate (describe ______________________)
			3H-21	• Byproducts used for feed. *Example: Distillers grains are brought in by semi-load and stored on a concrete pad; storm water from the pad is drained to an earthen storage for later land application.*
			3H-22	• Milk *Example: Non-saleable milk is land-applied at or below agronomic rates.*
			3H-23	• Eggs
			3H-24	• Other (list ______________________)
				Routine housekeeping plan includes cleanup of spilled raw materials so as to minimize storm water contamination. *Example: Cleaning up spilled feed beneath bulk bins.*
			3H-25	Equipment wash down areas are located on-site only in areas which drain to regularly maintained storages designed to accommodate such discharges. *Example: Truck wash for hauling animals drains to feedlot holding pond.*
				The storm water pollution prevention plan for access roads used to bring in or carry out raw materials, waste materials, by-products, or products that are used or created by the facility consists of:
				• Any spilled materials on or alongside the road(s) are routinely cleaned up and properly disposed of
				• Vegetation in drainage channels alongside the road(s) is maintained by mowing, sediment removal, and/or re-seeding as required
				Adequately maintained sanitary facilities (toilets and septic systems) are provided.
			3H-26	Other practices (list ______________________)

* Mark the map legend codes on facility/production area maps where appropriate.

Use Exclusion (Fencing Livestock from Surface Water)

Form 3-I

Mark those BMP's listed below that are applicable for this part of your operation.

Y	N	NA	Map Legend*	Practices
☐	☐	☐	3I-1	A minimal area along streams and ponds is left for livestock access and watering. Access is limited and the area is stabilized from erosion.
☐	☐	☐		Fencing materials consist of woven wire, barbed wire, or electrified high tensile wire and are constructed as outlined in the NRCS Conservation Practice Standard, Fence – Practice Code 382.
☐	☐	☐		Provisions are made for surface and subsurface drainage, as needed, and for disposal of runoff without causing erosion or water quality impairment.
☐	☐	☐		All treatment areas are shaped to prevent ponding of water.
☐	☐	☐	3I-2	Barriers and access ramps are periodically inspected and repairs performed as needed.
☐	☐	☐	3I-3	**Other practices** (describe)

* Mark the map legend codes on facility/production area maps where appropriate.

Fence—NRCS Practice Standard Code 382 and Use Exclusion—NRCS Practice Standard Code 472.

Temporary Manure Stack Discharge Prevention

Form 3-J

Mark those BMP's listed below that are applicable for this part of your operation.

Y	N	NA	Map Legend*	Practices
☐	☐	☐	3J-1	**Location**—Temporary manure stack is located down gradient (slope) from wells and springs.
☐	☐	☐		**Location**—Manure stack is located over soil surface that is highly impermeable and no aquifer material is within five feet of the bottom of the stack.
☐	☐	☐		**Location**—Manure stack is constructed more than 100 feet from non-potable water wells, 200 feet from potable water supply wells, and 400 feet from community water supply wells.
☐	☐	☐		**Operation**—Manure stack is completely emptied within a six-month period.
☐	☐	☐	3J-2	**Water diversions**—Manure stack has adequate diversion dikes, walls or curbs that will prevent excessive outside surface waters from flowing through the stack area.
☐	☐	☐		**Runoff**—There is negligible outside surface water that can flow through or otherwise contact the manure stack.
☐	☐	☐	3J-3	**Runoff disposal**—The runoff from the manure stack drains to a livestock waste-handling facility.
☐	☐	☐	3J-4	**Cover**—Temporary manure stack is covered with a roof, tarp, or other device to keep precipitation off the manure.
☐	☐	☐	3J-5	**Liner**—Manure stack is located over shallow aquifer material, in a karst area, or within 400 feet of a natural depression in a karst area; and is lined with appropriate clay, geosynthetic, or other liner material to protect groundwater.
☐	☐	☐	3J-6	**Other practices** (describe)

* Mark the map legend codes on facility/production area maps where appropriate.

Field Summary Legend

Form 6-B

Circle the column heading to indicate the "field descriptor" that you will use throughout your plan when you see the words "field name."

FSA Farm #	FSA Tract #	FSA Field #	Field Name	County Plat Map Description

Subsurface Drainage Inspection and Monitoring Plan

Form 6-E

Inspection and monitoring activity[1]	Crop: Permanent pasture or other permanent vegetation	Winter cover crop	Winter wheat	Double crop soybeans or other summer planted crop	Corn, full-season soybeans, grain sorghum, other row crops	Hay (alfalfa, grass, other)	Other crop ______
Inspect tile inlets for breakage or plugging							
Inspect tile outlets for breakage or plugging							
Inspect field for ponding, blowouts or other loss of tile function							
Other inspection (tile system structural) ______							
Monitor tile outlets for flow prior to manure application							
Monitor tile outlets for contaminated discharge during and after manure application							
Monitor tile outlet liquid for specific analytes: nitrate, etc.							
Other monitoring of tile flow contamination______							

1 Use the codes to indicate when each inspection and monitoring will be performed for each crop. Use multiple codes if applicable. Enter "NA" in the box if the item does not apply to that crop.

PT Prior to spring tillage and planting
PC Before plant canopy closure
PM Prior to manure application
MA During and immediately following manure application
GS During crop growing season
H During harvest
PH After harvest and before fall tillage operations
W During the winter
Q Quarterly
Other ______

Inspection, Monitoring, Management, and Repair of Subsurface Tile Drainage

Form 6-F

☐ Not applicable – fields have no subsurface tile drainage.

Field Name (See Form 6-B)	Inspected Date & Time	Inspected by (Name)	Repairs Needed		Repair Description	Date Repairs Completed	Monitoring Date & Time	Monitoring Results	Notes
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					
			Y	N					

Weekly Checklist:
Earthen Wastewater and Manure Storage Facility

Form 11-A

(Separate page for each facility)

Month/Year:________________ Storage Name: ________________ P = Pass F = Fail

	Deficiency noted*					
Date & Time of Inspection						
Inspected by (Name)						
Precipitation amount						
Freeboard (ft)—height to overflow						
Previous month rainfall amount						
Seepage on outside of berm	☐	P F	P F	P F	P F	P F
Wave damage or erosion evident	☐	P F	P F	P F	P F	P F
Stop/start pumping marked on staff gauge	☐	P F	P F	P F	P F	P F
Damp, soft areas, slumps or bulges	☐	P F	P F	P F	P F	P F
Rodent burrows or cracks	☐	P F	P F	P F	P F	P F
Grass mowed	☐	P F	P F	P F	P F	P F
Tree/bush growth	☐	P F	P F	P F	P F	P F
Liner in good condition	☐	P F	P F	P F	P F	P F
☐ NA						
If fence and gate—good condition	☐	P F	P F	P F	P F	P F
☐ NA						

Date of Corrective Action ________ Date Finished ______

If corrective action took longer than 30 days to complete, then state reason(s) why. Comments:

Weekly Checklist:

Below Grade Concrete Storages and Treatment Storages

Form 11-B

(Separate page for each facility)

Month/Year:____________________ Storage Name: ______________________ P = Pass F = Fail

	Deficiency noted*					
Date & Time of Inspection						
Inspected by (Name)						
Freeboard (ft)—height to overflow						
Staff or Level gauge visible	☐	P F	P F	P F	P F	P F
Any evidence of manure leaking	☐	P F	P F	P F	P F	P F
Footing drains—evidence of manure	☐	P F	P F	P F	P F	P F
Ponding next to pit	☐	P F	P F	P F	P F	P F
Gutters & downspouts drain away from storages	☐	P F	P F	P F	P F	P F
Pumpouts broken near grade	☐	P F	P F	P F	P F	P F
Other water entry routes to storages	☐	P F	P F	P F	P F	P F
Cracks in concrete	☐	P F	P F	P F	P F	P F
Hairline						
1/8 inch						
¼ inch						
> ¼ inch						

Date of Corrective Action __________ Date Finished _________

If corrective action took longer than 30 days to complete, then state reason(s) why.

Comments:

Other Manure Storage Best Management Practices

Form 11-D

Y	N	NA	Practice
☐	☐	☐	No outlet automatically releases storage from the required design volume. Manually operated outlets are of permanent type designed to resist corrosion and plugging.
☐	☐	☐	Non-polluted runoff is excluded from the structure to the fullest extent possible, except where its storage is advantageous to the operation of the agricultural waste management system (e.g. needed for dilution of manure).
☐	☐	☐	An auxiliary (emergency) spillway is part of the berm.
☐	☐	☐	Reinforced embankment, such as additional top width, flattened and/or armored downstream side slopes, is provided.
☐	☐	☐	To minimize the potential for accidental release of manure through gravity outlets, outlet gate lock(s) or locked gate housing is provided.
☐	☐	☐	Freeboard, in addition to the minimum required, is provided by storage design.
☐	☐	☐	Storage for wet year rather than normal year precipitation is provided.
☐	☐	☐	Secondary containment is provided.[1]
☐	☐	☐	Alarm system for overflow or other release is provided.
☐	☐	☐	Another means of safely emptying the required volume is provided.
☐	☐	☐	Other practices (describe) ______________________

1—The Illinois Livestock Management Facilities Act allows for the inclusion of secondary containment if recommended by a Professional Geologist or Professional Engineer.

Rainfall Records

Form 11-E

We

☐ have

☐ do not have

a rain gauge at our facility that we use to monitor and record precipitation.

Date / Time	Recorded by (Name)	Rainfall Amount

Daily Storage Inspection Log

Form 11-F

Storage name: ______________________________

If daily inspection is required, use the form below.

	Date & Time of Inspection	Inspection by (Name)	Precipitation amount	Freeboard (ft) —height to overflow
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				

Describe steps taken to dewater so a
☐ 100-year or
☐ 25-year, 24-hour capacity
is restored:

Manure Storage Pumping Levels Log

Form 11-G

All liquid and semi-solid storages

Storage name: ______________________________

Date & Time	Recorded by (Name)	Level Before Pumping*	Level After Pumping*	Substantial manure additions occurred during this pumping period
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐

* Uncovered outside storages require weekly freeboard records (**See Form 11-A**). These two columns should be synchronized with those records.

Manure Handling System Maintenance Record

(Example: pump, scraper, piping, valves, etc.)

Form 11-H

Date	Inspected by	Location	Equipment	Work Done

Weekly Storm Water/Pollution Prevention System Inspection Form

Form 11-I

P = Pass   F = Fail

	Deficiency noted	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Date & Time of Inspection									
Inspected by (Name)									
Roof guttering & downspouts	☐	P F	P F	P F	P F	P F	P F	P F	P F
Storm water diversions	☐	P F	P F	P F	P F	P F	P F	P F	P F
Channels	☐	P F	P F	P F	P F	P F	P F	P F	P F
Grassed filter strips	☐	P F	P F	P F	P F	P F	P F	P F	P F
Detention basins	☐	P F	P F	P F	P F	P F	P F	P F	P F
Containment diking	☐	P F	P F	P F	P F	P F	P F	P F	P F
Grassed waterways/ swales	☐	P F	P F	P F	P F	P F	P F	P F	P F
Other	☐	P F	P F	P F	P F	P F	P F	P F	P F

Date of Corrective Action __________ Date Finished __________

* If corrective action took longer than 30 days to complete, then state reason(s) why.

Daily Water Supply Line Inspection Form

Form 11-J

P = Pass F = Fail

	Deficiency noted	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Date & Time of Inspection								
Inspected by (Name)								
Zone 1**	☐	P F	P F	P F	P F	P F	P F	P F
Zone 2**	☐	P F	P F	P F	P F	P F	P F	P F
Zone 3**	☐	P F	P F	P F	P F	P F	P F	P F
Flow meter (write down your daily readings in the daily column)	☐							
Pressure gauge (write down your daily readings in the daily column)	☐							

Date of Corrective Action ____________________ Date Finished ________________

* If corrective action took longer than 30 days to complete, then state reason(s) why.
** If you use the zone 1, zone 2, zone 3 descriptors, the zones you use must be identified on your facility map Form 3-B.

Step 12: Records of Manure Application

Form 12-A Instructions: Field Application Record

1. Records of all livestock manure applications are to be kept. Use **Form 12-A** to keep track of all your manure applications by field (one form per field). Record the off-site transfer of manure on **Form 12-B**.
   - **Column 1**—Record the date and time of each application event.
   - **Column 2**—Record the name of the person writing this all down.
   - **Column 3**—Record the number of loads by making tally marks in the box.
   - **Column 4**—Record the amount of manure applied in either gallons or tons.
   - **Column 5**—Record the number of acres on which manure was applied. This will be the size of the field minus any setbacks.
   - **Column 6**—Record the application rate per acre in either gallons or tons.
   - **Column 7**—Identify the manure storage source for this manure.
   - **Column 8**—Identify the application method(s) used to apply this manure. For center pivot irrigation systems that span more than one field, enter the systems and the respective fields on **Form 6-B**, Field Summary Legend, and use a descriptive name for each system in the "field name" column.
   - **Column 9**—Record the wind speed and direction when this application is taking place.
   - **Column 10**—Record the weather conditions, using the codes at the bottom of the page.
   - **Column 11**—Record the relative humidity or dew point when this application is taking place. Weather records—average wind speed and direction, temperature, and dew point—are available electronically on a one-day delay at www.sws.uiuc.edu/warm.
   - **Column 12**—Record the soil moisture at the time this manure is being applied using the codes at the bottom of the page.
   - **Column 13**—Record the precipitation at the time this manure is being applied during the previous and post 24 hours.
   - **Column 14**—Circle "Y" if you will use data from this field application event to verify your equipment calibration in Step 14. Otherwise circle "N".
   - **Column 15**—As manure is being applied, if there is or is not any evidence of leakage, mark Y or N. If marked Yes, use **Form 12-C** to document.

2. This form in some way should be utilized during application to keep track, make notes, etc. that later can be consolidated on to **Form 12-A** (multiple pages may be necessary) and included in the plan. Do not rely on your memory while applying—make notes!!!

> **Hint:** Use a clipboard—it is harder to lose and easier to write on.

Form 12-B Instructions: Off-Site Transfer of Manure to Third Parties

1. Record all transfers of manure to third parties (off your facility or fields).
   - Record the date of the transfer.
   - Record the amount of manure transferred in either gallons or tons.
   - Record from which manure storage the manure was transferred.
   - You are required to give the third party a copy of the best management practices for the application of manure; check the box when you have done so. See Appendix L for a recommended list.
   - Record the name and address of the third party receiving the manure.
   - Record any notes about the transfer that might be relevant.

Form 12-C Instructions: Leak Inspection Log for Application

1. Manure application equipment, when used, must be inspected for leaks.
   - Use **Form 12-C** to record those inspections.
   - Fill in the date and time of the inspection and the name of the person that did the inspection.
   - Fill in the name or type of equipment inspected.
   - Fill in information about any leak repairs that were necessary.
   - Make any relevant notes.

ORGANIZATION TIPS:
- Place this information in the producer manual in the section called *Daily (Seasonal) Access and Data Entries—level two of the Pyramid.*
- Update this section when changes occur; do not wait until your annual plan update.

Field Application Record

(For Off-site transfer use Form 12-B)

Form 12-A

Field Name: ____________________ Year: __________

Date & Time	Recorded by (Name)	Number of loads - Tally	Total Amount (gal/tons)	Acres Receiving Manure	Rate gal/ton per acre	Which Manure Storage?	Application Method[1]	Wind Direction & Speed	Weather Conditions[2]†	Temperature	☐ Relative Humidity or ☐ Dew Point	Soil Moisture[3]	24 hr Precip. Previous	24 hr Precip. Post	Accuracy for Calibration (see Step 13)	Evidence of leaking equipment[4]
															Y N	Y N
															Y N	Y N
															Y N	Y N

1—Application methods: B = Broadcast, not incorporated the same day; BI = Broadcast, incorporated the same day; K = Knife injected; S = Sweep injected; I = Irrigation (See instructions if using center pivot.)
2—Weather conditions descriptions could include: S = sunny, PS = partly sunny, PC = partly cloudy, C = cloudy, OC = overcast
3—Soil moisture codes: D = Dry; Saturated = S; Ponded = PN; Frozen = FR; Snow-covered = SC
4—If yes, use Form 12-C. to show record of repairs.
†—See USA Today for sample codes.

Off-Site Transfer of Manure to Third Parties

Form 12-B

Date of transfer	Amount of manure transferred Gal/tons	From Which Storage	Manure analysis received by 3rd party	BMP's received by 3rd party	Name & Address of Recipient	Notes
			☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		

Suggested BMP's to be given are included in Appendix L, Nutrient Management—NRCS Practice Standard Code 590, Waste Utilization—NRCS Practice Standard Code 633.

MAURER-STUTZ

MANURE EXPORT RECORD TABLES

PROJECT: MURPHY-BROWN, LLC. MT. ERIE FARMS

PROJECT NO.: 23804009.01

CROP YEAR 2020

MANURE TESTS - lb per 1000 gal unless noted

DATE	LOCATION	LAB #	TKN	AMMONIA	ORGANIC	P2O5	K2O	PAN/ACRE
11/4/2020	Elm River	8822590	2.34	1.64	0.70	0.54	4.63	1.86
11/4/2020	Lakeside	8822592	3.51	3.10	0.41	0.56	7.47	3.18
11/4/2020	Lakeview	8822589	3.89	2.74	1.15	0.38	5.29	3.08
11/4/2020	Little Wabash	8822591	2.71	2.07	0.64	0.36	5.50	2.25
11/4/2020	Mt. Erie	8822588	1.90	1.62	0.28	0.43	5.22	1.68

MANURE EXPORT RECORDS

FIELD	ACRES	Date	SOURCE	RATE	TOTAL	PAN/ACRE	P205/ACRE	K2O/ACRE
B1		10/19/2019			880,015			
B10		11/11/2019			544,775			
B11		11/9/2019			279,821			
B12		11/8/2019			833,304			
B2		10/24/2019			368,265			
B21		10/18/2019			355,327			
B22		10/23/2019			381,340			
B3		11/3/2019			1,142,468			
B4		11/11/2019			270,618			
B6		11/5/2019			1,234,609			
B7		11/5/2019			842,004			
B8		11/6/2019			1,045,067			
B9		11/4/2019			352,565			
E18		10/16/2019			736,140			
E20		10/8/2019			1,642,534			
E35		10/16/2019			492,435			
H37		10/20/2019			1,155,098			
S25		11/9/2019			812,132			
S30		11/9/2019			838,070			
S31A		10/2/2019			1,877,532			
S31B		10/3/2019			1,759,063			
S36		8/16/2019			2,319,303			
S36		9/16/2019			2,596,574			
S36		9/30/2019			1,282,499			
S27		5/26/2020	228		1,783,790			
S27		5/16/2020	228		544,025			
S24		5/15/2020	228		436,424			
S24		5/14/2020	229		2,076,841			
B22		5/10/2020	230		263,984			
B21		5/10/2020	230		684,200			
B10		5/13/2020	231		715,654			
B4		5/13/2020	231		307,150			
B6		5/4/2020	232		1,217,879			
B6		5/2/2020	232		117,626			
B1		5/11/2020	230		816,468			
B2		5/10/2020	230		558,092			
B7		5/7/2020	232		747,419			
B7		5/4/2020	232		181,535			
B8		5/7/2020	232		1,098,071			
H37		5/11/2020	230		601,537			
H37		5/10/2020	230		733,921			
B12		5/14/2020	231		875,026			
B3		5/13/2020	231		70,866			
B3		5/12/2020	231		493,466			
B3		5/12/2020	230		843,849			
B11		5/13/2020	231		416,133			
					39,625,514			

MAURER-STUTZ

MANURE EXPORT RECORD TABLES

PROJECT: MURPHY-BROWN, LLC. MT. ERIE FARMS

PROJECT NO.: 23804009.01

CROP YEAR 2021

MANURE TESTS - lb per 1000 gal unless noted

DATE	LOCATION	LAB #	TKN	AMMONIA	ORGANIC	P2O5	K2O	PAN/ACRE
11/4/2020	Elm River	8822590	2.34	1.64	0.70	0.54	4.63	1.86
11/4/2020	Lakeside	8822592	3.51	3.10	0.41	0.56	7.47	3.18
11/4/2020	Lakeview	8822589	3.89	2.74	1.15	0.38	5.29	3.08
11/4/2020	Little Wabash	8822591	2.71	2.07	0.64	0.36	5.50	2.25
11/4/2020	Mt. Erie	8822588	1.90	1.62	0.28	0.43	5.22	1.68
3/23/2021	Elm River	8879124	2.95	2.20	0.70	0.70	5.30	2.40
3/23/2021	Lakeside	8879126	4.44	3.67	0.80	1.20	8.00	3.88
3/23/2021	Lakeview	8879123	5.29	4.76	0.50	1.30	5.80	4.84
3/23/2021	Little Wabash	8879125	5.53	3.68	1.90	0.90	5.50	4.27
3/23/2021	Mt. Erie	8879122	3.90	3.48	0.40	0.90	5.20	3.55

MANURE EXPORT RECORDS

FIELD	ACRES	Date	SOURCE	RATE	TOTAL	PAN/ACRE	P205/ACRE	K2O/ACRE
B10		12/11/2020	229		1,296,000			
B11		12/10/2020	231		682,000			
B12		12/10/2020	231		1,711,831			
B2		11/10/2020	229		262,000			
B22A		11/10/2020	229		201,000			-
B3		11/11/2020	229		1,314,800			
B4		11/12/2020	229		463,900			
B6		12/9/2020	231		1,196,000			
B7		12/8/2020	231		730,000			
B9		12/7/2020	231		300,000			
H36		12/7/2020	228		2,868,683			
H38		12/5/2020	228		1,490,432			
S25		12/9/2020	232		1,418,042			
S27		12/10/2020	230		2,410,288			
S28		12/9/2020	232		1,752,475			
S29		12/8/2020	232		1,164,520			
S30		12/9/2020	232		481,624			
S32		12/8/2020	232		1,156,995			
S33		4/12/2021			903,900			
S31A		4/13/2021			1,150,000			
S31B		4/14/2021			1,004,500			
S24		4/8/2021			3,543,739			
H37		4/9/2021			1,637,833			
B8		4/12/2021			1,929,800			
B5		4/6/2021			1,407,000			
B21		4/6/2021			551,000			
B1		4/10/2021			821,000			
					33,849,362			

MAURER-STUTZ

MANURE EXPORT RECORD TABLES

PROJECT: MURPHY-BROWN, LLC. MT. ERIE FARMS

PROJECT NO.: 23804009.01

CROP YEAR 2022

MANURE TESTS - lb per 1000 gal unless noted

DATE	LOCATION	LAB #	TKN	AMMONIA	ORGANIC	P2O5	K2O	PAN/ACRE
4/8/2022	Elm River	70092221	2.56	1.79	0.80	0.90	5.00	2.03
4/8/2022	Lakeside	70092223	1.66	1.30	0.40	1.10	6.70	1.41
4/8/2022	Lakeview	70092220	4.97	4.29	0.70	1.00	5.70	4.45
4/8/2022	Little Wabash	70092222	3.56	2.93	0.60	0.90	5.00	3.08
4/8/2022	Mt. Erie	70092219	3.08	2.35	0.70	0.90	5.00	2.55

MANURE EXPORT RECORDS

FIELD	ACRES	Date	SOURCE	RATE	TOTAL	PAN/ACRE	P205/ACRE	K2O/ACRE
H37		11/16/2021	232		1,038,580			
B1		11/16/2021	232		446,428			
H37		11/17/2021	232		157,295			
B6		11/17/2021	232		1,172,502			
B7		11/19/2021	232		700,266			
B8		11/19/2021	232		700,046			
L39		11/20/2021	231		1,519,444			
S25		11/22/2021	229		441,684			
S30		11/23/2021	229		556,023			
S25		11/23/2021	229		558,693			
S28		11/24/2021	229		1,510,806			
L39		11/29/2021	231		1,114,675			
S24		11/30/2021	228		1,751,790			
S27		12/1/2021	228		1,146,886			
S24		12/1/2021	228		425,800			
S27		12/2/2021	230		531,432			
B3		5/13/2022	228		1,016,098			
L39		5/16/2022	231		2,041,283			
L39		5/15/2022	231		784,957			
H38		5/10/2022	230		1,295,805			
S27		5/15/2022	228		829,792			
S27		5/14/2022	228		1,816,981			
S24		5/17/2022	229		2,520,210			
H36		5/13/2022	230		328,215			
H36		5/12/2022	230		1,673,116			
H36		5/11/2022	230		1,566,713			
					27,645,520			

MAURER-STUTZ

MANURE EXPORT RECORD TABLES

PROJECT: MURPHY-BROWN, LLC. MT. ERIE FARMS

PROJECT NO.: 23804009.01

CROP YEAR 2023

MANURE TESTS - lb per 1000 gal unless noted

DATE	LOCATION	LAB #	TKN	AMMONIA	ORGANIC	P2O5	K2O	PAN/ACRE
3/2/2023	Elm River	70252730	2.50	1.94	0.60	0.70	5.90	2.11
3/2/2023	Lakeside	70252732	3.21	2.57	0.60	1.40	8.50	2.73
3/2/2023	Lakeview	70252729	5.50	4.66	0.80	1.00	7.20	4.85
3/2/2023	Little Wabash	70252731	3.13	2.56	0.60	0.70	5.20	2.72
3/2/2023	Mt. Erie	70252728	3.16	2.47	0.70	0.70	6.50	2.67

MANURE EXPORT RECORDS

FIELD	ACRES	Date	SOURCE	RATE	TOTAL	PAN/ACRE	P205/ACRE	K2O/ACRE
S32		10/17/2022	232		1,410,282			
S29		10/18/2022	232		1,350,590			
S35		10/19/2022	229		701,912			
S28		10/22/2022	231		177,029			
S28		10/21/2022	231		1,021,430			
S24		10/23/2022	230		1,185,172			
S24		10/22/2022	230		795,793			
S30		10/20/2022	229		280,433			
S30		10/19/2022	229		455,466			
S25		10/21/2022	231		601,775			
S25		10/20/2022	231		1,255,265			
H38		4/19/2023	228		1,082,701			
H36		4/19/2023	228		255,535			
H36		4/20/2023	228		1,461,588			
H36		4/25/2023	228		958,970			
B2		4/26/2023	230		303,552			
H36		4/26/2023	228		441,182			
B3		4/27/2023	230		785,578			
B22		4/27/2023	230		329,119			
B4		4/28/2023	230		201,824			
B3		4/28/2023	230		122,391			
S24		4/29/2023	229		2,025,576			
B10		4/30/2023	232		619,601			
B12		5/1/2023	232		1,082,093			
B11		5/1/2023	232		344,588			
L39		5/2/2023	231		1,806,444			
L39		5/3/2023	231		1,056,461			
					22,112,350			

MAURER-STUTZ

MANURE EXPORT RECORD TABLES

PROJECT: MURPHY-BROWN, LLC. MT. ERIE FARMS
PROJECT NO.: 23804009.01

CROP YEAR 2024

MANURE TESTS - lb per 1000 gal unless noted

DATE	LOCATION	LAB #	TKN	AMMONIA	ORGANIC	P2O5	K2O	PAN/ACRE
3/18/2024	Elm River	70431245	2.51	2.25	0.30	0.60	5.80	2.31
3/18/2024	Lakeside	70431247	3.83	3.31	0.50	0.90	8.10	3.42
3/18/2024	Lakeview	70431244	4.46	3.92	0.50	0.70	6.40	4.02
3/18/2024	Little Wabash	70431246	4.93	4.16	0.80	0.90	5.10	4.36
3/18/2024	Mt. Erie	70431243	3.21	3.01	0.20	0.70	6.60	3.02

MANURE EXPORT RECORDS

FIELD	ACRES	Date	SOURCE	RATE	TOTAL	PAN/ACRE	P205/ACRE	K2O/ACRE
B22A		10/31/2023	232		349,298			
B2		10/31/2023	232		363,686			
B3		10/31/2023	232		405,043			
B1		11/1/2023	232		509,640			
B3		11/1/2023	232		674,117			
B1		11/2/2023	232		194,581			
H37		11/2/2023	232		911,471			
B9		11/3/2023	231		201,764			
B7		11/3/2023	231		435,612			
B6		11/3/2023	231		959,306			
B8		11/4/2023	231		851,959			
B7		11/4/2023	231		499,595			
B10		11/6/2023	229		527,015			
B11		11/6/2023	229		300,370			
B12		11/6/2023	229		783,347			
H36		11/7/2023	228		1,022,808			
H36		11/8/2023	230		636,647			
S35		3/25/2024	232		446,442			
S29		3/27/2024	232		424,766			
S32		3/27/2024	232		975,940			
H37		3/28/2024	231		407,731			
S29		3/28/2024	232		614,632			
B1		3/29/2024	231		337,099			
H37		3/29/2024	231		375,093			
B6		3/29/2024	231		351,660			
B6		3/30/2024	229		406,068			
B7		3/30/2024	229		568,982			
B6		3/30/2024	231		167,257			
B7		3/31/2024	229		235,211			
B8		3/31/2024	229		1,005,517			
S27		4/1/2024	230		1,307,614			
					17,250,271			

MAURER-STUTZ

MANURE EXPORT RECORD TABLES

PROJECT: MURPHY-BROWN, LLC. MT. ERIE FARMS

PROJECT NO.: 23804009.01

CROP YEAR 2025

MANURE TESTS - lb per 1000 gal unless noted

DATE	LOCATION	LAB #	TKN	AMMONIA	ORGANIC	P2O5	K2O	PAN/ACRE
3/21/2025	Elm River	70603651	1.83	1.55	0.30	0.60	6.40	1.62
3/21/2025	Lakeside	70603653	3.08	2.28	0.80	0.90	8.10	2.51
3/21/2025	Lakeview	70603650	4.01	3.75	0.30	0.60	5.10	3.78
3/26/2025	Little Wabash	70603652	3.46	2.83	0.60	0.50	5.10	2.98
3/21/2025	Mt. Erie	70603649	3.65	2.96	0.70	0.50	4.50	3.15

MANURE EXPORT RECORDS

FIELD	ACRES	Date	SOURCE	RATE	TOTAL	PAN/ACRE	P205/ACRE	K2O/ACRE
H38		10/28/2024	228		1,203,705			
H36		10/29/2024	228		286,974			
H36		10/29/2024	228		424,925			
H38		10/29/2024	228		188,226			
H36		10/30/2024	228		402,044			
H36		10/30/2024	228		908,245			
H36		11/1/2024	228		84,178			
H36		11/1/2024	228		560,823			
H36		11/1/2024	228		640,226			
B21		11/2/2024	230		403,558			
B2		11/2/2024	230		274,477			
B3		11/3/2024	230		296,157			
B2		11/3/2024	230		51,182			
B22		11/3/2024	230		365,832			
B3		11/8/2024	230		815,212			
B4		11/8/2024	230		256,021			
B6		11/9/2024	231		1,772,795			
B8		11/11/2024	229		357,333			
B8		11/11/2024	231		522,952			
B7		11/11/2024	231		249,903			
B12		11/12/2024	229		481,220			
B12		11/12/2024	229		272,482			
B10		11/12/2024	229		614,190			
B12		11/13/2024	229		126,953			
B11		11/13/2024	229		379,741			
					11,939,354			

Leak Inspection Log for Application Equipment

Form 12-C

Date & Time	Inspected by (Name)	Equipment	Leak Repair	Notes

Work with your equipment dealer for suggestions on inspection and regular maintenance for specific equipment.
If the last column on **Form 12-A** is marked "yes," provide information on this form.

Step 13: Manure Applicator Equipment Calibration

Form 13-A Instructions: Calibration Method Used

1. Identify the calibration method you use to calibrate your manure application equipment.

Form 13-B Instructions: Land Area Method of Calibration

1. If you use the land area method of calibration, use **Form 13-B**.
   - Record the name of the field (**See Form 3-B**).
   - Record the date and time the calibration was done.
   - Record the name of the person recording this information.
   - Record the total amount of manure (in either gallons or tons) you will be using.
   - Record the total number acres that manure will be applied to.
   - Record the application rate you calculated.

Form 13-C Instructions: Calibration—Show Calculations

1. You are required to show the calculations you made when you calibrated your equipment.
   - Appendix M contains information about different formulas and methods for calibrating manure application equipment for several different application methods.
   - Using **Form 13-C** record the date and the name of the Certified Livestock Manager that supervised the calibration and calculations.
   - Identify the equipment you are calibrating.
   - On **Form 13–C** or on a separate page, show your calculations for calibrating your application equipment and record your application rate.

ORGANIZATION TIPS:

- Place this information in the producer manual in the section called *Daily (Seasonal) Access and Data Entries—level two of the Pyramid.*
- Update this section when you do your annual plan update.

Check Calibration Method Used

Form 13-A

(One sheet for each method used)

Date: ______________

Method Used	Calibration Methods	Equipment & Travel Speed/Gear	Information You Need
☐	Liquid manure in storage *(Note: tanker, towed hose, or irrigation)*		• Total gallons spread • Total acres receiving manure
☐	Liquid manure in spreader		• Gallons in spreader load • Distance driven and width spread
☐	Liquid manure in spreader		• Pounds in spreader load • Distance driven and width spread
☐	Liquid manure via towed-hose: flow meter or pump mfg's chart		• Liquid flow rate to toolbar • Ground speed • Width spread
☐	Solid/semi-solid manure in storage		• Cubic feet spread • Total acres receiving manure
☐	Solid manure in spreader		• Spreader volume, bushels • Distance driven and width spread
☐	Solid manure in spreader		• Pounds/tons in spreader load • Distance driven and width spread
☐	Solid manure in spreader		• Area of drive-over sheet • Net weight of manure deposited on sheet (averaged)
☐	5-gallon bucket		Net weight of manure in bucket
☐	Liquid manure via sprinkle irrigation		Inches collected in gauges

Land Area Method of Calibration

Form 13-B

Field Name (See Form 3-B)	Date /Time	Recorded By (Name)	Gallons/ Ton Total	Total Applied Acres	Calculated Application Rate

Calibration–Show Calculations

Form 13-C

One sheet for each calibration performed. Show calculations based on the method checked.

Date: ______________________________

CLM: ______________________________

Equipment identification (e.g., XYZ spreader, etc.): ______________________________

Rate =

Appendix F. Guidance Information

F.1. Air Quality AND Pathogen Management Considerations

It may not be practical or feasible to eliminate all odor emissions from the operation, but it is possible to manage or mitigate the odor. Some variables that effect odor are:

*	Type of operation	*	Building design
*	Ventilation method	*	Animal numbers
*	Animal diets	*	Manure treatment systems
*	Season	*	Topography
*	Management skill or effort	*	

1. Animal Cleanliness

   a. Clean, dry, and healthy animals are less odorous. Dirty, manure-covered animals promote accelerated bacterial growth and the production of odorous gases.

   b. Animal stress can also be correlated to an increase in odor production. Ventilation and environmental controls for the buildings must be properly designed and maintained to keep the animals healthy.

2. Minimize Dust

   a. It has been established that there is a correlation between dust and odor emission. Dust particles absorb and concentrate odorous compounds. As the dust particles are carried by the wind, so is the odor.

   b. Therefore, minimizing dust will reduce odor. Most farm dust comes from feed, fecal matter and, in the case of poultry, from feathers and litter. Dust also comes from animal skin, insects, and other sources.

   c. Buildings should be cleaned of all dust between batches of animals (including fans, shutters, and screens.)

3. **Waste Storage Facility** – to reduce emissions of greenhouse gases, ammonia, volatile organic compounds, and odor:

   Consider alternatives and additional practices including covered anaerobic digesters (365), and composting facilities (317).

   Adjusting pH below 7 may reduce ammonia emissions from the waste storage facility but may increase odor when waste is surface applied.

   Consideration should be also given to the separation of the solids from the waste mixture. This will dilute the liquid waste product being treated in the lagoon and cause less odor. The solid separated material can be composted and sold or land applied.

4. **Animal diets** can also be manipulated to produce less manure production and odors from the manure. Much of the odors from manure are from nitrogen, sulfur, and carbohydrate containing volatile compounds. Balancing the diet with proper amounts and forms of protein and reducing excess protein in the diet will reduce nitrogen excretion and odor emissions from the manure.

5. **Proper Disposal of Mortality** – Normal mortality for the animal feeding operation *must* be properly handled for both odor control and biological security of the operation. Composting, incineration, and rendering are acceptable methods for mortality disposal.

6. **Good Fly and Rodent Control Programs** – These programs must be a continuous process on the farm. When feed and waste products are properly handled, these problems are minimized.

7. **Utilize Trees** – While trees should not grow directly adjacent to facilities, wind breaks of trees correctly positioned near the facility not only create a visual barrier but can also provide a large filtration surface for dust and odorous compound removal. Trees can absorb odorous compounds and create turbulence that enhances odor dispersion and dilution. Trees also can create a cooler microclimate around the facility, which can reduce odors.

Pathogen Management

Many of the same conservation practices used to prevent nutrient movement from this animal feeding operation, such as runoff and erosion control are likely to minimize the movement of pathogens. Pathogenic organisms occur naturally in animal wastes. Exposure to some pathogens can cause illness to humans and animals, especially for immune-deficient populations.

Land Application Operation and Maintains

Land Application

a. Note wind direction and avoid spreading when the wind is blowing toward populated areas.
b. Avoid spreading on weekend/holidays when people are likely to be engaged in nearby outdoor and recreational activities.
c. Spread in the morning when air begins to warm and is rising, rather than in the afternoon.

d. Use available weather information to best advantage. Turbulent breezes will dissipate and dilute odors. Hot and humid weather tends to concentrate and intensify odors, particularly in the absence of breezes. Rain will remove the odor from the atmosphere.
e. Use natural vegetation barriers, such as woodlots or windbreaks, to help dissipate and filter odors.
f. Establish vegetated air filters in the field border area by planting conifers and shrubs as windbreaks and visual screens between cropland and residential developments.

F.2. Livestock Management Facilities Act Waste Application Provisions

a) Waste applied within 1320' (1/4 mile) of any residence not owned by the facility shall be injected or incorporated on the day of application.
b) Waste shall not be applied within:
   1. 200' of surface water unless the water is up-gradient or there is adequate diking to prevent runoff, and
   2. 150' of a potable water supply well.
c) Waste shall not be applied in a 10-year flood plain unless the injection or incorporation method of application is used.
d) Livestock waste shall not be applied in waterways.
e) Waste that is spread on frozen or snow-covered land shall be limited to areas which:
   1. Land slope is 5% or less, or
   2. Adequate erosion control practices exist
f) The certified livestock manager shall inspect all berm tops, exterior sides, non-submerged interior sides for evidence of erosion, burrowing animal activity, and other indications of berm degradation at least every two weeks and keep an inspection log.
g) Livestock waste shall not be applied during a rainfall or to saturated soil and conservative application rates shall be used in the case of a high water table or shallow earth cover to fractured bedrock. Caution shall be exercised in applying livestock waste, particularly on porous soils, so as not to cause nitrate or bacteria contamination of the groundwater.

v)

F.3. CAFO Application Provisions

w)

1. Livestock waste applied within ¼ mile of any residence not part of the facility shall be injected or incorporated on the day of application. However, livestock management facilities and livestock waste handling facilities that have irrigation systems in operation prior to May 21, 1996, or existing facilities applying waste to frozen ground are not subject to this.
2. Livestock waste may not be applied within 200 feet of surface water unless the water is upgrade or there is adequate diking and waste will not be applied within 150 feet of potable water supply wells.
3. Livestock waste may not be applied in a 10-year flood plain unless the injection or incorporation method of application is used.
4. Livestock waste may not be applied in waterways. For the purpose of this Part, a grassed area serving as a waterway may receive livestock waste through an irrigation

5. Livestock waste may not be applied during a rainfall or to saturated soil, and a conservative waste-loading rate will be used in the case of high water table or shallow earth cover to fractured bedrock. Caution should be exercised in applying livestock wastes, particularly on porous soils, so as not to cause nitrate or bacteria contamination of groundwater.
6. Livestock waste shall not be applied within 100 feet of down gradient (slope) open subsurface drainage intakes, agricultural drainage wells, sinkholes, waterways or other conduits to surface waters, unless a 35-foot vegetative buffer exists between the land application area and the waterways, open subsurface drainage intakes, agricultural drainage wells, sinkholes or other conduits to surface water. NOTE: The NRCS standards 590 and 633 or the waste management plan provisions of 8 Ill. Adm. Code 255, Subpart H: Waste Management Plan may have provisions that are more restrictive.

F.4. Winter Application

The facility does not intend to apply manure to frozen, ice covered, or snow-covered ground. However, if the facility does determine that a winter application plan is needed, the CNMP will need to be updated with a winter application plan that meets 35 Ill Adm. Code 502.630 I.

Winter Application Prohibition. Surface land application of livestock waste on frozen, ice-covered, or snow-covered ground is prohibited except as specified below.

1)Notwithstanding the winter application prohibition, surface land application of livestock waste on frozen, ice-covered or snow-covered ground is allowed if all of the following conditions are met:

A) No practical alternative measures are available to handle the livestock waste within storage facilities or to dispose of the livestock waste at other sites. Examples of practical alternative measures may include, but are not limited to, the transfer of waste to another waste handling facility or sewage treatment plant, rental or acquisition of a storage tank, reduction of herd size or depopulation, and protection of the facility from direct precipitation and clean stormwater runoff;

B) Liquid livestock waste cannot be injected or incorporated within 24 hours after application due to soil conditions;

C) Prior to December 1, the owner or operator has taken steps to provide 120 days of available storage capacity of manure storage areas. Examples of steps that could be taken may include, but are not limited to, land application of livestock waste, transfer of waste to another party, protection of waste storage structures from direct precipitation and stormwater runoff, and depopulating facilities to reduce the amount of waste generated;

D) The owner or operator has taken steps to provide storage, yet the storage volume available on December 1 of that winter season is less than 120 days of storage;

E) The owner or operator has notified the IEPA in writing on December 1 of that winter season that the CAFO has less than 120 days storage available; and

F) The discharge of livestock waste from the structure to the surface waters is expected to occur due to shortage in storage capacity.

4) The storage volume calculation in subsection (a)(1)(C) must include runoff and direct precipitation plus the volume of livestock excreta, wash water and other process wastewater generated and expected to enter the storage structure during the period of December 1 to April 1. Runoff volume calculations must meet the requirements of IAC 502.630(2)

5) In the event winter land application is necessary, it must be conducted pursuant to a winter application plan described in subsection (b) and according to the conditions of subsection (c).

Winter Application Plan - In order to conduct surface land application on frozen, ice covered, or snow covered ground, the requirements of this subsection (b) must be met.

1) No land application may occur within ¼ mile of a non-farm residence.

2) No discharge may occur during land application of livestock waste.

3) Surface land application on frozen ground shall not occur within 24-hours preceding a forecast of 0.25 inches or more of precipitation in a 24-hour period as measured in liquid form. The CAFO owner or operator shall use one of the following two methods for determining whether these conditions exist and shall maintain a record of the forecast from the source used.

A) A prediction of a 60 percent or greater chance of 0.25 inches or more of precipitation in a 24-hour period as measured in liquid form, obtained from the National Weather Service; or

B) A prediction of 0.25 inches or more of precipitation in a 24-hour period as measured in liquid form and identified as higher than QPF category 2 obtained from the National Weather Service.

4) Surface land application of livestock waste on ice covered or snow covered land shall not occur within 24 hours preceding a forecast of 0.1 inches or more of precipitation in a 24 hour period as measured in liquid form. The CAFO owner or operator shall use one of the two methods provided below for determining whether or not these conditions exist and shall maintain a record of the forecast from the source used.

A) A prediction of a 60 percent or greater chance of 0.1 inches or more of precipitation in a 24-hour period as measured in liquid form obtained from the National Weather Service; or

B) A prediction of 0.1 inches or more of precipitation in a 24-hour period as measured in liquid form and identified as higher than QPF category 1 obtained from the National Weather Service.

5) If the land application of livestock waste is on ice covered or snow covered land, surface land application shall not occur when the predicted high temperature exceeds 32 degrees F on the day of land application or on any of the 7 days following land application as predicted by the National Weather Service for the location nearest to the land application area. The owner or operator shall maintain a record of the forecast from the source used.

6) If the surface land application of livestock waste is on ice covered or snow covered land, the CAFO owner or operator shall visually monitor for runoff from the site. The CAFO owner or operator daily must monitor each ice covered or snow covered field where land application has been conducted when the ambient temperature is 32 degrees F or greater following winter land application until all the ice or snow melts from the land application area.

7) If the surface land application of livestock waste is on ice covered or snow covered land and a runoff from the land application area occurs, the CAFO owner or operator shall report any discharge of livestock waste within 24 hours after the discovery of the discharge as follows:

A) The report shall be made to the Agency through the Illinois Emergency Management Agency by calling 1-800-782-7860 or 1-217-782-7860;

B) Within 5 days after this telephone report, the CAFO owner or operator shall file a written report with the Agency that includes the name and telephone number of the person filing the report, location of the discharge, an estimate of the quantity of the discharge, time and duration of the discharge, actions taken in response to the discharge, and observations of the condition of the discharge with regards to turbidity, color, foaming, floatable solids and other deleterious conditions of the runoff for each day of each runoff event until the ice or snow melts off the site.

Availability of Individual Fields for Winter Application

If livestock waste is to be surface applied on frozen ground, ice covered land or snow covered land, the land application may only be conducted on land that meets the following requirements:

1)Adequate erosion and runoff control practices exist, including, but not limited to, vegetative fence rows around the site, contour farming, terracing, catchment basins and buffer areas that intercept surface runoff from the site;

2)A crop stubble, crop residue or vegetative buffer of 200 feet exists between the land application area and surface waters, waterways, open tile line intake structures, sinkholes, agricultural wellheads, or other conduits to surface water and the vegetative buffer zone is down gradient of the livestock waste application area;

3)Application on land with slopes greater than 5% is prohibited;

4)Application may only occur on sites that have field specific soil erosion loss calculated using Revised Universal Soil Loss Equation less than Erosion Factor T, and have a median Bray P1 or Mehlich 3 soil level of phosphorus equal to or less than 300 pounds per acre;

5)Surface application may only occur if the setbacks equal three times the otherwise applicable setbacks as shown on the setback maps in Section 4. This setback requirement does not include the quarter mile distance from residences; and

6) For fields with slopes of less than 2 percent, the surface application may only occur if the setbacks equal two times the otherwise applicable setbacks shown in Section 4. This setback requirement does not include the quarter mile distance from residences.

F.5. Manure Application on Steep Fields

Steep Fields
Wastes are not to be applied to cropland over 15% slopes or to pastures/hayland over 20% slopes unless one of the following precautions is taken:
Immediate incorporation or injection with operations done on the contour, UNLESS the field has 80% ground cover (residue and/or canopy).

1. Applications are timed during periods of lower runoff and/or rainfall (Late May to Mid-October).
2. Apply low rates through split applications (separated by rainfall events). Apply no more than 10 wet tons/acre for solid manure/wastes; or 5000 gallons/acre for liquid manure/wastes.
3. The field is established and managed in contour strips with alternate strips in grass or legume.

F.6. Manure Application on Fields Subject to Flooding

Fields Subject to Flooding
Manure is not to be land-applied on soils that are frequently flooded unless incorporated immediately on the day of application.

F.7. General Liquid Manure Applications

LIQUID MANURE APPLICATIONS - For liquid wastes, the application rate is to be adjusted to the most limiting factor to avoid ponding, surface runoff, subsurface drainage (tile) discharge, the nutrient needs of the field, or the nitrogen or phosphorus risks for the field. The total application is not to exceed the field capacity of the upper 8 inches of soil. See **G.1. (Available Water Capacity (AWC) Practical Soil Moisture Interpretations for Various Soils Textures and Conditions to Determine Liquid Waste Volume Applications not to exceed AWC)** to determine AWC and the amount (volume) that can be applied to reach the AWC. The actual application rate shall be adjusted during application to avoid ponding or runoff. Bare/Crusted soils may require some tillage to improve infiltration.

F.8. Liquid Manure Application – Tile Drained Fields

Fields or areas of fields that are subsurface (TILE) drained require additional precautions. When liquid wastes are applied to fields with subsurface (TILE) drains, the liquid can follow soil macropores directly to the tile drains creating a surface water pollution hazard from direct tile discharge. A field is considered subsurface (tile) drained if 1/3 or more of the field is subsurface (tiled) drained; however, even a field with one subsurface drainage line may present a risk of manure/wastewater movement to subsurface drains and cause a direct discharge.
Do not apply application rates (volume) that would exceed the lesser of the AWC in the upper 8 inches or 13,000 gallons/acre per application.

Prior to manure application, use a tool (AERWAY tool or similar tool) that can disrupt/close (using horizontal fracturing) the preferential flow paths (worm holes, cracks, root channels) in the soil, or till the surface of the soil 3-5 inches deep to a condition that will absorb the liquid wastes. The purpose is to have the surface soil act as a sponge to soak up the liquid manure and keep it out of preferential flow channels. This is especially important if shallow tile are present (< 2 feet deep). Any pre-application tillage should leave as much residue as possible on the soil surface. The adsorption of liquid manure by the soil in the root zone will minimize nitrogen loss and the manure/nutrient runoff potential. For perennial crops (hay or pasture), or continuous no till fields where tillage is not an option, all tile outlets from the application area are to be plugged prior to application.

If injection is used, inject only deep enough to cover the manure with soil. Till the soil at least 3 inches below the depth of injection prior to application, or all tile outlets from the application area are to be plugged prior to application.

In addition to tillage prior to surface liquid waste application or injection, install in-line tile flow control structures or inflatable tile plugs that can mechanically stop or regulate tile flow either prior to application, or have on site if needed to stop tile flow. Use caution not to back tile water where it may impair the functioning of an offsite subsurface drainage system.

F.9. Manure Application on Fields with "Systematic Surface Drainage"

Criteria for Systematic Surface Drained Fields:

Fields or areas of fields that have systematic "surface drainage" systems (e.g. shallow surface drains spaced 100 – 200 feet apart). These "internal" surface drains are considered concentrated flow areas. However, if special precautions are taken, manure can be applied in the surface drains with minimal risk of surface runoff. THIS DOES NOT APPLY TO THE COLLECTOR SURFACE DRAINS (mains) OR DRAINS BORDERING THE FIELDS. The following special manure application techniques shall be used:

Till the surface at least 3 to 5 inches deep prior to liquid manure surface application. For SOLID manure till either prior to application or incorporate within 24 hours. This can be done with a heavy disk, chisel plow, plow, field cultivator, AERWAY tool, or similar tool that can provide "full-width" soil disturbance to a depth of 3 to 5 inches.

Surface apply the liquid manure uniformly over the entire soil surface on the freshly tilled soil. The purpose of the surface application on the freshly tilled soil is to allow the liquid manure to be soaked/absorbed into the entire 3 to 5 inches of loose soil surface.

For fields that have no subsurface drainage, the liquid manure can be injected directly with no prior tillage.

Limit LIQUID application rates to 13,000 gallons per acre or less per application.

F.10. Minimum Ground Cover for Manure Applications

Medium Phosphorus Risk Fields

- The fields shall have at least 30% ground cover at the time of application or the manure or other organic by-products shall be incorporated within one week.

High Phosphorus Risk Field

- The field shall have at least 50% ground cover at the time of application unless the manure is incorporated within 24 hours on areas with < 50% cover.

Generalized Interpretation of the Nitrogen Leaching Risk Analysis:

a. Fields with a rating of "LOW" or " MEDIUM" have a low/medium potential to leach nitrates below the root zone. These fields have more flexibility for timing of nitrogen application; however, care must be taken to limit loss of applied nitrogen through denitrification.
b. Fields with a rating of HIGH" have a high potential to leach nitrates below the root zone. Fields with systematic subsurface drains (tile) are rated "HIGH" potential to leach nitrates out of the root zone. These fields require management that applies the nitrogen closer to the time the crop can utilize the applied nitrogen.

Criteria for Nitrogen via Commercial Fertilizer Sources:

On fields with a "High Nitrogen Leaching Potential" apply the recommended nitrogen for spring planted crops prior to planting spring crops or split applications between pre-plant and a sidedress application. For perennial crops split the recommended application between two or three periods including early spring, early summer, or late summer. For fall planted crops apply 20-30 Lbs/Ac of the recommended amount in the fall and the remainder in the spring. Nitrogen may be fall applied for spring planted crops following the guidance in Table 1 of this standard.

Criteria for Nitrogen Application via Manure (during Summer and Fall Periods):

On fields with a "High Nitrogen Leaching Potential" and with no growing crop, manure and other organic by-products application is to be limited to 50 Lbs/ac of Nitrogen (Ammonium N + 1/3 of the Organic N) calculated at the time of application from June to October 1st to limit nitrogen leaching. When a grass or legume cover crop is growing or established immediately after waste application, manure or other organic by-products can be applied prior to October 1st at the recommended Nitrogen rate for the next non-legume crop or the nitrogen removal rate for the next legume (maximum 150 Lbs/ac) crop.

Appendix G. Available Water Capacity (AWC)

G.1. Available Water Capacity (AWC) Practical Soil Moisture Interpretations for Various Soils Textures and Conditions to Determine Liquid Waste Volume Applications Not to Exceed AWC

This table shall be used to determine the AWC at the time of application and the liquid volume in gallons that can be applied not to exceed the AWC. To determine the AWC in the upper 8 inches use a soil probe or similar device to evaluate the soil to a depth of 8 inches.

Available Moisture in the Soil	Sands and Loamy Sands	Sandy Loam and Fine Sandy Loam	Very Fine Sandy Loam, Loam, Silt Loam, Silty Clay Loam, Clay Loam, Sandy Clay Loam	Sandy Clay, Silty Clay, Clay
< 25% Soil Moisture	Dry, loose and single-grained; flows through fingers.	Dry and loose; flows through fingers.	Powdery dry; in some places slightly crusted but breaks down easily into powder.	Hard, baked and cracked; has loose crumbs on surface in some places.
Amount to Reach AWC	20,000 gallons/ac	27,000 gallons/ac	40,000 gallons/ac	27,000 gallons/ac
25-50% or Less Soil Moisture	Appears to be dry; does not form a ball under pressure.	Appears to be dry; does not form a ball under pressure.	Somewhat crumbly but holds together under pressure.	Somewhat pliable; balls under pressure.
Amount to Reach AWC	15,000 gallons/ac	20,000 gallons/ac	30,000 gallons/ac	20,000 gallons/ac
50 - 75 % Soil Moisture	Appears to be dry; does not form a ball under pressure.	Balls under pressure but seldom holds together.	Forms a ball under pressure; somewhat plastic; slicks slightly under pressure.	Forms a ball; ribbons out between thumb and forefinger.
Amount to Reach AWC	10,000 gallons/ac	13,000 gallons/ac	20,000 gallons/ac	13,000 gallons/ac
75% to Field Capacity	Sticks together slightly; may form a weak ball under pressure.	Forms a weak ball that breaks easily, does not stick.	Forms ball; very pliable; slicks readily if relatively high in clay.	Ribbons out between fingers easily; has a slick feeling.
Amount to Reach AWC	5,000 gallons/ac	7,000 gallons/ac	11,000 gallons/ac	7,000 gallons/ac
100% Field Capacity	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.
Above Field Capacity	Free water appears when soil is bounced in hand.	Free water is released with kneading.	Free water can be squeezed out.	Puddles: free water forms on surface