

Manure Nutrient Management Plan Notebook

Department of Agricultural Engineering
University of Illinois
1304 West Pennsylvania Avenue, Room 332
Urbana, IL 61801

217.333.7964 voice
217.244.0323 fax

SECTION I. GENERAL INFORMATION
A. Owner/Operator/Facility Information

Owner information

Owner

Name: JK Pork
Address: 2041 N. County Rd. 1800
City: Carthage State: IL Zip: 62321
Phone: (217) 746-8691

Manager/Operator Information

Mgr./Oper.

Name: Dan Carlisle
Address: 2041 N. County Rd. 1800
Carthage
Phone: (217) 746-8691 State: IL Zip: 62321

Facility information

Facility

Address: Elvaston, IL
Plat location: North side of section 31, 32 Prairie Township
Directions from nearest post office: Elvaston, IL - one block east, 1/2 mile south, 1/2 mile east

Phone: (217) 845-3901

C. General Farm Map *"Use more pages as necessary to show all the fields where manure may be applied. Include map of facility and its surrounding area."*

Outline the property boundaries

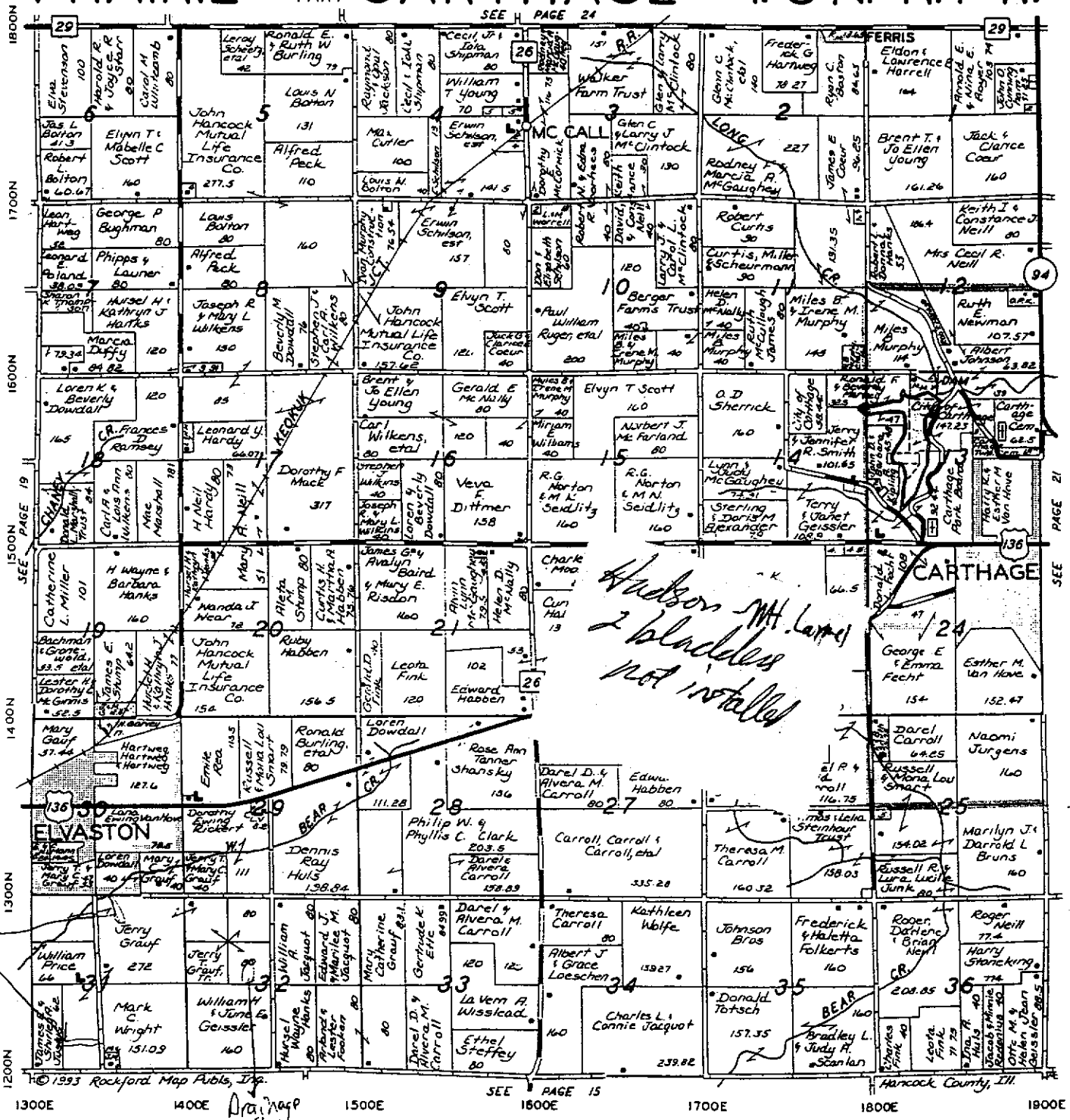
Include an indication of distance scale on the map. List crop acreages on fields that will receive manure.

Mark the following:

- | | | | |
|--------------------------|--|--------------------------|-------------------------------------|
| <input type="checkbox"/> | Facility | <input type="checkbox"/> | Waterways |
| <input type="checkbox"/> | Residences | <input type="checkbox"/> | Lakes, ponds |
| <input type="checkbox"/> | Streams | <input type="checkbox"/> | Rivers |
| <input type="checkbox"/> | Drainage ditches | <input type="checkbox"/> | Other water sources and conveyances |
| <input type="checkbox"/> | Water wells "private, municipal, injection, abandoned, etc." | | |
-

PRAIRIE WEST PART CARTHAGE T. 5 N.-R. 7 W.

SEE PAGE 24

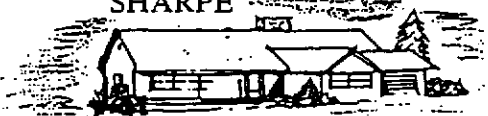


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SEE PAGE 15

Appraisals • Residential • Farmland • Commercial

SHARPE



REAL ESTATE

Randy Sharpe, Broker

Business: (217) 357-2145 • Residence: (217) 659-7880

59 South Adams - Carthage, Illinois 62321

ChemGro Inc.

ADRIAN, ILLINOIS
 Phone: (217) 746-3111
 (800) 543-2085
 ELVASTON, ILLINOIS

BOWEN, ILLINOIS
 Phone: (217) 842-5514
 BURNSIDE, ILLINOIS
 Phone: (217) 746-2641

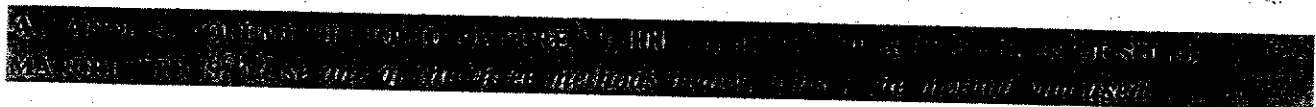
BUYERS OF: CORN — BEANS — WHEAT
 Complete Fertilizer and Chemical Business

SEE PAGE 21
PRAIRIE TWR → CARTHAGE TWR

SECTION II. MANURE STORAGE INFORMATION

Note: Use a separate page for each manure storage. May be different from the buildings pages.

A. Manure Storage Description three acre lagoon, one acre lagoon, 0.2 acre lagoon



Year: 1997

- (1) Estimated from tabulated values of per-animal manure production. "Show calculation. Ex: number of animals at size, time of storage, x per-day production."
- (2) Calculated from site-specific measurements. "Show measurements and calculation. Ex: rectangular storage, Length x Width x Depth. Show estimated annual percent fill, not necessarily 100 percent."
- (3) Calculated from manure application records. "Show calculation method. Ex: loads hauled per year x gallons per load."

Calculations:

MWPS table 701-1

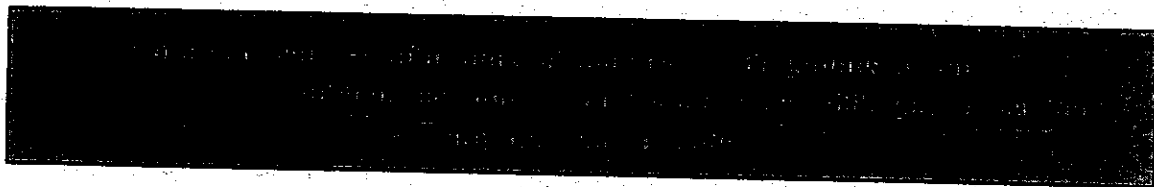
Gallons/year

525 sows in breeding/gestation	X 1.1 gal/day =	210,787
75 sows with litters	X 4.0 gal/day =	109,500
1750 nursery pigs	X 0.27 gal/day =	172,462
850 grower pigs (S.Grower)	X 0.48 gal/day =	148,920
850 Finisher pigs (S.Finisher)	X 1.13 gal/day =	350,582
425 Grower pigs (N.Grower)	X 0.48 gal/day =	74,460
425 Finisher pigs (N.Finisher)	X 1.13 gal/day =	175,291
	Total	1.24 million gallons per year

C. OPTIONAL PAGE: TOTAL NUTRIENTS AVAILABLE FROM MANURE IN THIS STORAGE.

Notes:

1. This page is not necessary if the total nutrients calculation is being done by computer and will show up on the printout.
2. Calculations on this page will **NOT** break out the field application losses of nutrients. That is, these calculations show:
 - a. the "as excreted" manure nutrient values times a storage loss factor, if manure storage total volume is figured from tabulated values of per-animal daily production x storage time, *or*
 - b. the "average nutrients for typical storages" values if the total volume is known but there are no laboratory analyses of manure, only table values.



Example: Total N = 23,000,000 gal. x 30 lb/1000 gal. = 690,000 pounds total

Total N	=	<u>1.24m</u>	x	<u>5</u>	x	<u>70%</u>	=	<u>4340</u>	pound total
				storage loss factor*					
Ammonium N plus nitrate N	=	<u>1.24m</u>	x	<u>4</u>	=	<u>04960</u>	pounds total		
P ₂ O ₅	=	<u>1.24m</u>	x	<u>3</u>	=	<u>3720</u>	pounds total		
K ₂ O	=	<u>1.24m</u>	x	<u>4</u>	=	<u>4960</u>	pounds total		

SECTION III. TABLES

Table 1. Typical total-nitrogen losses during handling and storage of manure.

Use these values for planning, or if a laboratory analysis of the manure take just prior to land application is not available.

System	Percent loss	
	lower limit: short term storage, cool conditions	higher limit: long term storage, warm conditions
Solid Manure		
daily scrape and haul	20	35
manure pack	20	40
open lot	40	55
deep pit (poultry)	25	50
litter (poultry)	25	50
Liquid Manure		
anaerobic pit	15	30
above ground storage	10	30
earth storage	20	40
lagoon	70	85

Source: MWPS-18, LIVESTOCK WASTE FACILITIES HANDBOOK, 1993 printing.

Table 3. Mineralized organic nitrogen.

Amount of organic nitrogen mineralized (made available to crops) during the first cropping season after manure application³.

Manure type	Manure handling	Mineralization factor
Swine	fresh	0.50
	anaerobic liquid ¹	0.35
	aerobic liquid ²	0.30
Beef	solid without bedding	0.35
	solid with bedding	0.25
	anaerobic liquid ¹	0.30
	aerobic liquid ²	0.25
Dairy	solid without bedding	0.35
	solid with bedding	0.25
	anaerobic liquid ¹	0.30
	aerobic liquid ²	0.25
Poultry	deep pit	0.60
	solid with litter	0.60
	solid without litter	0.60

¹pit, above-ground storage, or unaerated lagoon

²well-aerated lagoon or oxidation ditch

³Nitrogen credits for the mineralized organic nitrogen in livestock waste applied during the previous three years are calculated at the rate of 50%, 25%, and 12.5%, respectively, of that mineralized during the first year.

Source: MWPS-18, LIVESTOCK WASTE FACILITIES HANDBOOK, 1993 printing.

FSA Field Number MT 4223

Phosphorus needs as P_2O_5 .

Use table 4-7 to determine phosphorus needs based on crop yield goals. Note: if P_1 soil test is less than 50 lb/acre, you may use a buildup rate of phosphorus on this field. If P_1 soil test is greater than 50 lb/acre, use maintenance values for phosphorus. If P_1 soil test is greater than 150 lb/acre, do not apply manure to this field this year.

This year's crop 42 lb/acre

Second year's crop 64 lb/acre

Third year's crop 42 lb/acre

Potassium needs as (K_2O)

Use table 4-7 to determine potassium needs based on crop yield goals. Note: if K soil test is lower than 250-300 lb/acre, you may use a buildup rate of potassium on this field. If K soil test is higher, use a maintenance rate of potassium.

This year's crop 65 lb/acre

MANURE NUTRIENT MANAGEMENT PLAN NOTEBOOK

Page 2 of 2 per field.

Year _____

FSA Field Number _____

Phosphorus needs as P_2O_5 .

Use table 4-7 to determine phosphorus needs based on crop yield goals. Note: if P_1 soil test is less than 50 lb/acre, you may use a buildup rate of phosphorus on this field. If P_1 soil test is greater than 50 lb/acre, use maintenance values for phosphorus. If P_1 soil test is greater than 150 lb/acre, do not apply manure to this field this year.

This year's crop 73 lb/acre

Second year's crop 42 lb/acre

Third year's crop 73 lb/acre

Potassium needs as (K_2O)

Use table 4-7 to determine potassium needs based on crop yield goals. Note: if K soil test is lower than 250-300 lb/acre, you may use a buildup rate of potassium on this field. If K soil test is higher, use a maintenance rate of potassium.

This year's crop _____ lb/acre

MANURE NUTRIENT MANAGEMENT PLAN NOTEBOOK

Page 2 of 2 per field.

Year _____

FSA Field Number _____

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Second year's crop 42 lb/acre

Third year's crop 73 lb/acre

Potassium needs as (K_2O)

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This year's crop _____ lb/acre

MANURE NUTRIENT MANAGEMENT PLAN NOTEBOOK

Page 2 of 2 per field.

Year _____

FSA Field Number _____

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This year's crop _____ 73 _____ lb/acre

Second year's crop _____ 42 _____ lb/acre

Third year's crop _____ 73 _____ lb/acre

Potassium needs as (K_2O)

Use table 4-7 to determine potassium needs based on crop yield goals. Note: if K soil test is lower than 250-300 lb/acre, you may use a buildup rate of potassium on this field. If K soil test is higher, use a maintenance rate of potassium.

This year's crop _____ 48 _____ lb/acre

Show calculations here. Refer to Chapter 4, Table 4-19 for the appropriate method.

One load/half mile. Swath of 15 ft. = 8100 gallons/acre. Wagon holds 7300 gallons.

APPENDIX A.

SUBPART C: WASTE MANAGEMENT PLAN

Section 505.30. Purpose

Livestock waste management plans shall be prepared by livestock management facility owners or operators to provide for adequate land area for the proper application of livestock waste at agronomic crop nitrogen usage rates.

- Section 505.31. Requirements**
- A. The owner or operator of a livestock management facility with less than 1,000 animal units shall not be required to prepare and maintain a waste management plan.
 - B. The owner or operator of a livestock management facility with 1,000 or greater but less than 7,000 animal units shall comply with the following:
 - 1. For facilities in existence as of the effective date of this Part, the owner or operator shall prepare and maintain a waste management plan within 60 working days after the effective date of this Part;
 - 2. For facilities which commence operations after the effective date of this Part, the owner or operator shall prepare and maintain a waste management plan within 60 working days of commencing operations;
 - 3. For facilities that reach or exceed 1,000 animal units through expansion, the owner or operator shall prepare and maintain a waste management plan within 60 working days after reaching or exceeding 1,000 animal units;
 - 4. Prior to the end of the time period in subsections 505.302(b)(1) through (b)(3) above the owner or operator shall submit to the Department a form certifying that a livestock waste management plan has been prepared. The form shall also list the location of the plan; and
 - 5. The livestock waste management plan and records of waste disposal pursuant to Section 505.310 of this Part shall be kept on file at the facility for three years and shall be available for inspection by Department personnel during normal business hours.
 - C. The owner or operator of a livestock management facility with 7,000 or greater animal units shall comply with the following:
 - 1. For facilities in existence as of the effective date of this Part, the owner or operator shall submit to the Department a waste management plan

Section 505-303 Waste Management Plan Contents

The Livestock Waste Management Plan shall contain the following items:

- A. Name, address, and phone number of the owner(s) of the livestock facility;
- B. Name, address, and phone number of the manager or operator if different than the owner(s);
- C. Address, phone number, and plat location of the facility, and directions from the nearest post office;
- D. Type of waste storage for the facility;
- E. Species, general size, and number of animals at the facility;
- F. Aerial photos and maps outlining fields available and intended for livestock waste applications with available acreage listed and with residences, streams, wells, waterways, lakes, ponds, rivers, drainage ditches, and other water sources indicated;
- G. For application fields not owned or rented, copies of waste application agreements between the owner or operator of the livestock facility and the owner of the land where livestock waste will be applied;
- H. An estimate of the volume of livestock waste to be disposed of annually;
- I. Cropping schedule for each field for the past year, the current year, and the next two years after the current year;
- J. Optimum crop yields for each crop in each field, verified by yield history, if available;
- K. Nutrient content of the livestock waste;
- L. Livestock waste application methods;

MANURE NUTRIENT MANAGEMENT PLAN NOTEBOOK

Section 505.303 (m)(1) of this Part shall be obtained as follows:

- A. For lagoons, or other structures containing diluted livestock waste, the facility owner or operator shall determine the volume for disposal through site specific measurements. An explanation of the method used to determine the volume for disposal shall be provided by the owner or operator and included in the plan.
- B. For storage tanks or other holding structures containing undiluted livestock waste, site specific measurements of volume are preferred. In lieu of actual measurements, values from Table 2-1, MWPS-18, "Livestock Waste Facilities Handbook," p. 2.1 may be used.

Section 505.303 (m)(2) Nutrient Content of Livestock Waste

Values of nutrient content in livestock waste, as required in Section 505.303(m)(2) of this Part, may be obtained from Tables 2-1, 2-2, 10-6, or 10-7, MWPS-18, "Livestock Waste Facilities Handbook," pp.2.1, 2.2, 10.4, 10.5, or from the results of an analysis performed on samples of waste from the livestock facility. Laboratory analysis results shall be included in the waste management plan if the data is used for determining the nutrient content.

Section 505.303 (m)(3) Correction Factors for Storage Availability

- A. For Section 505.303(m)(3) of this Part, correction factors for nutrient loss from livestock waste due to type of handling and storage shall be obtained from Table 10-1, MWPS-18, Livestock Waste Facilities Handbook, p.10.2, if nutrient content data is obtained from Tables 2-1 or 2-2, MWPS-18, "Livestock Waste Facilities Handbook," pp. 2.1, 2.2.
- B. For Section 505.303(m)(3) of this part, correction factors for nitrogen loss from livestock waste due to method of application to the land shall be obtained from Table 10-2, MWPS-18, "Livestock Waste Facilities Handbook," p. 10.2.
- C. For Section 505.303(m)(4) of this Part, factors for calculating available nitrogen from organic nitrogen in livestock waste shall be obtained from Table 10-5, MWPS-18, "Livestock Waste Facilities Handbook," p. 10.4.

Section 505.300 Records of Waste Disposal

Records of the livestock waste disposal shall include the following items:

- A. Date of livestock waste application;
- B. Field identification;
- C. Method of application;
- D. Livestock waste application rate;
- E. Number of acres receiving waste; and
- F. Amount of livestock waste applied.

Section 505.303 Approval of Waste Management Plans

- A. Department approval of livestock waste management plans shall be based on the following criteria:
 - 1. Livestock waste application rates of nitrogen based on crop usage for optimum yields;
 - 2. Demonstration of adequate land area for waste application based on Section 505.303 of this Part; and
 - 3. Completeness and accuracy of plan contents as specified in Section 505.303 of this Part.
- B. The owner or operator of the livestock management facility shall be notified by the Department within 30 working days of receipt of the livestock waste management plan that the plan has been approved or that further information or changes are needed. The owner or operator shall provide the information or changes with 30 working days.

Section 505.304 Penalties

- A. Any person who is required to prepare and maintain a waste management plan and who fails to do so shall be issued a warning letter by the Department for the first violation and shall be given 30 working days to prepare a waste management plan. For failure to prepare and maintain a waste management plan, the person shall be fined an administrative penalty of up to \$500 by the Department and shall be required to enter into an agreement of compliance to prepare and maintain a waste management plan within 30 working days. For failure to prepare and maintain a waste management plan after the second 30 day period or for failure to enter into a compliance agreement, the Department may issue an operational cease and desist order until compliance is attained.

Copy to: Chuck Gunnarson
return to DLH Vdome

RECEIVED

October 7, 1998

Illinois Environmental Protection Agency
C/o Dan Heacock
2200 Churchill Road MC 15
P. O. Box 19276
Springfield IL 62794-9276

OCT 08 1998

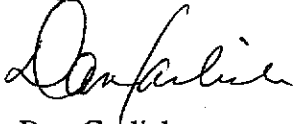
ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY
BOW/WPC/PERMIT SECTION

Re: JK Pork, Inc - NPDES Permit No. IL0072648

Dear Mr. Heacock,

This letter is in response to the letter I received September 16, 1998, concerning NPDES Permit No. IL 0072648. The letter stated the application was incomplete. Due to the volume of information needed to review and complete the application, I would like to submit the renewed application by December 31, 1998. I would prefer to take our time and go through the procedure correctly so we don't have to go through this again. To facilitate this process, I will be using consultants whose time is in very high demand this time of year. I would like to involve them when their time is not at such a premium. If you have any questions, please contact me at anytime. Thank you for your consideration in regards to this matter.

Regards,



Dan Carlisle
President
JK Pork, Inc.

217782-0610

JK Pork, Inc.
2041 N. County Road 1800
Carthage, IL 62321

Re: JK Pork, Inc. - NPDES Permit No. 0072648 -Review Letter

Dear Mr. Carlisle

The Agency has reviewed the NPDES permit application received October 30, 1997 and the waste management plan of October 29, 1997. The Agency offers the following items for your consideration and appropriate action:

1. Please indicate if there are any projected changes to the size of the operation pursuant to Section 502.201 of Subtitle E.
2. Please provide a plat map or USGS map indicated the location and acreage of each land application area proposed in the waste mangement plan.
3. Please provide a description of the equipment and methods for the land application of the livestock waste.
4. Please provide soil survey maps and soil descriptions from a soil survey for each land application site.
5. Please indicate the slope of each land application site.
6. Please indicate the depth to seasonal high or mean annual water table for each land application site.
7. Please depict on the maps of the land application sites the location of waterways, streams, lakes and other surface waters.
8. Please provide a sketch or plot plan of the site that depicts the flow of surface water by topography or other means for the livestock management facility site and associated livestock waste handling facilities. Include all areas tributary to the livestock waste handling facilities.
9. Please indicate the location of any uncontaminated stormwater diversions from the

livestock waste handling facilities.

10. Please provide on drawings of the facility the dimensions of the all the manure storage pits, lagoons and other livestock waste handling facilities at the site. Adequate detail must be provided to determine the volume of each livestock waste handling structure.
11. The Agency has reviewed the proposed waste management plan and offers the following comments concerning the agronomic calculations:
 - A. The plan estimates 1.24 million gallons of waste produced per year by the facility apparently using values from table 2-1 of MWPS-18. Please be advised that the heading of this table indicates that for swine farrowing and gestation twice as much and for swine nurseries 3-4 times as much wastewater may be generated as shown in the table. Please revise your estimates of the wastewater to be produced by the facility.
 - B. The calculation on page 8 uses a storage loss factor. Please be advised that the 5 lbs/1000 gallons TKN for properly sized and operated lagoons accounts for storage losses in the lagoons according to table 10-7 of MWPS-18, 1993 version. Please revise the calculations accordingly.
 - C. The 5 year yield average is indicated to be 120 bu/acre for corn and 40 bu/acre for soybeans for each land application site. The calculations use 170 bu/acre yield goal for corn and 50 bu/acre for soybeans. Section 560.201 of Subtitle E recommends the use of a reasonably anticipated crop yield. The 120 bu/acre corn yield and 50 bu/acre for soybeans are the yield goals that meet the requirements of these regulations. Please revise the calculations accordingly.
 - D. The calculations indicate for the 170 bu/acre corn yield an available nitrogen demand of 136 lbs/acre. Please provide supporting calculations and references supporting this value of available N and how it will be used to determine the agronomic nitrogen application rate for the crop grown.
 - E. The waste management plan and does not provide calculations indicating the land application rate of the livestock waste. Please revise the calculations indicating the application rate to be used.
 - F. Please indicate the points of withdrawal of the livestock waste from the livestock waste handling facilities (i.e., surface of lagoons, manure pits, etc.).

Please review the above items and provide a written response so that the Agency may complete

its review of the subject permit application.

If you have any questions or comments concerning the content of this letter, please contact Dan Heacock of my staff at the telephone number and address shown above.

Very Truly Yours,

Thomas G. McSwiggin, P. E.
Manager, Permit Section
Division of Water Pollution Control

TGM/DLH/jkpork.doc

cc: DWPC/FOS Region 3
Chuck Gunnarson/DLC
Records Unit

217/782-0610

JK Pork, Inc.
2041 N. County Road 1800
Carthage, IL 62321

Re: JK Pork, Inc. - NPDES Permit No. 0072648 -Review Letter

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Page 3

JK Pork, Inc. - NPDES Permit No. IL0072648

Reveiw Letter

its review of the subject permit application.

If you have any questions or comments concerning the content of this letter, please contact Dan Heacock of my staff at the telephone number and address shown above.

Very Truly Yours,

Thomas G. McSwiggin, P. E.

Manager, Permit Section

Division of Water Pollution Control

TGM/DLH/jkpork.doc

cc: DWPC/FOS Region 3

Chuck Gunnarson/DLC

Records Unit

Summary of Livestock Waste Land Application - JK Pork

Table 1 Page 17 of Subtitle E

Swine produce 0.045 lb/day N per 100 lbs body weight

Table 2 Page 17 of Subtitle E Anaerobic Lagoon

10-15 lbs N per 1000 gallons

Using table 1 data from Subtitle E for anaerobic lagoons

Total swine poundage = 507875 lbs
 83418.47 lbs N/year produced

1.3 lbs/acre/year

They have 120 bu corn

@ 120 bu/acre corn then application rate for N is 156 lbs PAN/Acre

534.7338 acres needed for land application

Table 10-4 of MWPS-18 (1993) land application of manure

For injection from lagoons 61.2 acres/100 sows to get 100 lbs N/acre/year using 48 *1.275 due to injection
 For injection from anaerobic pit 155 acres/100 sows to get 100 lbs N/acre/year

Table 10-7 of MWPS-18

	Anaerobic lagoon	Liquid pit
lbs of NH4-N/1000 gallons	4	24
lbs of TKN-N/1000 gallons	5	36

MWPS-18 TABLE 10-4 These values include storage and application losses

Assuming 156 lbs N/acre

600 sows

596 acres needed for land application from pits
235 acres needed for land application from lagoon

MWPS-18, 1993

TABLE 2-1

	weight(lbs)	lb/day N	gal/day
Swine			
Nursery pig	35	0.02	0.3
Growing pig	65	0.03	0.5
Finishing pig	150	0.07	1.2
	200	0.09	1.6
Gestating Sow	275	0.07	1.1
Sow and Litter	375	0.1	2.7
Boar	350	0.09	1.4
Gilt*	200	0.09	1.6

*Gilt is assumed to be the same as finishing pig

These ratios of pigs obtained from page 6 of the October 29, 1997 waste management plan

			Total N (lbs/day)	RAW Volume(gal/day)	RAW + WASH
Farrowing Sows	75	28125	7.5	202.5	405
Gestating Sows	525	144375	36.75	577.5	1155
Nursery Pigs	1750	61250	35	525	1837.5
Growing pigs	1275	82875	38.25	637.5	637.5
Finishing pigs	1275	191250	89.25	1530	1530
Total		507875	206.75	3472.5	5565

Total N per year 75463.75 Total Volume per year = 2031225 gallons raw + wash

Using Subtitle E Data

Nitrogen 83418.47 Lbs N/yr produced by animals

Volume 1853744 gallons per year produced by animals

MWPS-18, 1993
table 10-8

volume

Breeding 1453 gal/yr/1000 lbs body weight 737942.4

Total 737942.4 gallons per year raw feces and urine

ASSUME from TABLE 10-1 and 10-2 of MWPS-18 80 Percent loss in lagoon system and 1 percent loss injection
TABLE 10-1 70-80 percent loss in lagoons and TABLE 10-2, 1 percent loss for injection

14941.82 PAN/YR

95.78091 acres needed to provide the acreage needed for an agronomic nitrogen application rate(co

IF we use the more conservative estimates

22639.13 PAN/YR

145.1226 acres needed to provide the acreage needed for an agronomic nitrogen application rate

These values do not include any additional swine that might be present (i.e.,gilts and boars)

Application Rate using Tables 2-1, 10-1 and 10-2 of MWPS-18 and 80 percent lagoon loss =

21206.99 gallons per acre

Summary of Livestock Waste Land Application - JK Pork

Table 1 Page 17 of Subtitle E

Swine produce 0.045 lb/day N per 100 lbs body weight

Table 2 Page 17 of Subtitle E Anaerobic Lagoon

10-15 lbs N per 1000 gallons

Table 10-4 of MWPS-18 (1993) land application of manure

For ~~irrigation~~ ^{injection} from lagoons 61.2 acres/100 sows to get 100 lbs N/acre/year using 48 *1.275 due to injection
 For ~~irrigation~~ ^{injection} from anaerobic pit 155 acres/100 sows to get 100 lbs N/acre/year

Table 10-7 of MWPS-18

	Anaerobic lagoon	Liquid pit
lbs of NH4-N/1000 gallons	4	24
lbs of TKN-N/1000 gallons	5	36

Using table 1 ^{Subtitle E} data for anaerobic lagoons

Total swine poundage = 507875 lbs
 83418.47 lbs N/year produced

Agronomic Nitrogen Demand 156 lbs PAN/Acre Based on corn at 120 bu/acre

534.7338 acres needed for land application

MWPS-18 TABLE 10-4 These values include storage and application losses

Assuming 156 lbs N/acre

600 sows

596 acres needed for land application from pits
235 acres needed for land application from lagoon

CROP	ACREAGE	Total N Uptake(lbs)
Alfalfa	14.4	2246.4
Tall Fescue	28.8	0
Orchard Grass	28.8	0
	72 Total	2246.4
Corn	13	2028
Soybeans	74	11544
Alfalfa	40	6240
Fescue	15	0
Orchard grass	12	0
	154 Total	19812

MWPS-18, 1993

TABLE 2-1

	weight(lbs)	lb/day N	gal/day
Swine			
Nursery pig	35	0.02	0.3
Growing pig	65	0.03	0.5
Finishing pig	150	0.07	1.2
	200	0.09	1.6
Gestating Sow	275	0.07	1.1
Sow and Litter	375	0.1	2.7
Boar	350	0.09	1.4
Gilt*	200	0.09	1.6

*Gilt is assumed to be the same as finishing pig

These ratios of pigs obtained from page 6 of the October 29, 1997 waste management plan			RAW	RAW + W
No.	lb/day ^{lb/day}	Total N (lbs/day)	Volume(gal/day)	Volume(gal/day)
Farrowing Sows	75	28125	7.5	202.5
Gestating Sows	525	144375	36.75	577.5
Nursery Pigs	1750	61250	35	525
Growing pigs	1275	82875	38.25	637.5
Finishing pigs	1275	191250	89.25	1530
Total		507875	206.75	3472.5

Total N per year 75463.75 Total Volume per year = 2031225 gallons raw + wash

Using Subtitle E Data

Nitrogen 83418.47 Lbs N/yr produced by animals
 Volume 1853744 gallons per year produced by animals

**MWPS-18, 1993
table 10-8**

	1453 gal/yr/1000 lbs body weight	volume
Breeding		737942.4
Total		737942.4 gallons per year raw feces and urine

ASSUME from TABLE 10-1 and 10-2 of MWPS-18 80 Percent loss in lagoon system and 1 percent loss injection to get TABLE 10-1 70-80 percent loss in lagoons and TABLE 10-2, 1 percent loss for ~~spray irrigation~~ ^{injection}

14941.82 PAN/YR

95.78091 acres needed to provide the acreage needed for an agronomic nitrogen application rate(corn @ 1

IF we use the more conservative estimates

22639.13 PAN/YR

145.1226 acres needed to provide the acreage needed for an agronomic nitrogen application rate

These values do not include any additional swine that might be present (i.e., gilts and boars)

Early Sep
Optional if

1.3 lbs/acre/year		
They have 120 bu corn		50
@ 120 bu/acre corn then application rate for N is	156 lbs N/acre	50
		50

	Total*
ember	0
fall growth desired	0
	0
	156
	0

Summary of Livestock Waste Land Application - JK Pork

Table 1 Page 17 of Subtitle E

Swine produce 0.045 lb/day N per 100 lbs body weight

Table 2 Page 17 of Subtitle E Anaerobic Lagoon

10-15 lbs N per 1000 gallons

Table 10-4 of MWPS-18 (1993) land application of manure

For ~~irrigation~~ ^{injection} from lagoons 61.2 acres/100 sows to get 100 lbs N/acre/year using 48 *1.275 due to injection
 For ~~irrigation~~ ^{injection} from anaerobic pit 155 acres/100 sows to get 100 lbs N/acre/year

Table 10-7 of MWPS-18

	Anaerobic lagoon	Liquid pit
lbs of NH4-N/1000 gallons	4	24
lbs of TKN-N/1000 gallons	5	36

Using table 1 data for anaerobic lagoons

Total swine poundage = 535500 lbs
 87955.88 lbs N/year produced

Agronomic Nitrogen Demand 156 lbs PAN/Acre Based on corn at 120 bu/acre

563.8197 acres needed for land application

MWPS-18 TABLE 10-4 These values include storage and application losses

Assuming 156 lbs N/acre

600 sows

596 acres needed for land application from pits
235 acres needed for land application from lagoon

CROP	ACREAGE	Total N Uptake(lbs)
Alfalfa	14.4	2246.4
Tall Fescue	28.8	0
Orchard Grass	28.8	0
	72 Total	2246.4
Corn	13	2028
Soybeans	74	11544
Alfalfa	40	6240
Fescue	15	0
Orchard grass	12	0
	154 Total	19812

MWPS-18, 1993

TABLE 2-1

	weight(lbs)	lb/day N	gal/day
Swine			
Nursery pig	35	0.02	0.3
Growing pig	65	0.03	0.5
Finishing pig	150	0.07	1.2
	200	0.09	1.6
Gestating Sow	275	0.07	1.1
Sow and Litter	375	0.1	2.7
Boar	350	0.09	1.4
Gilt*	200	0.09	1.6

*Gilt is assumed to be the same as finishing pig

These ratios of pigs obtained from page 6 of the October 29, 1997 waste management plan

			Total N (lbs/day)	Volume(g)
Farrowing Sows	75	28125 ^{2.1}	7.5	202.5
Gestating Sows	525	144375 ^{1.2}	36.75	577.5
Nursery Pigs	1750	61250 ³	35	
Growing pigs	1700	110500 ⁵	51	
Finishing pigs	1275	191250 ^(1.1)	89.25	
Total		535500	219.5	780
Total N per year	80117.5	Total Volume per year =	284700 gallons	

Using Subtitle E Data

Nitrogen 87955.88 Lbs N/yr produced by animals
 Volume 1954575 gallons per year produced by animals

**MWPS-18, 1993
table 10-8**

Breeding 1453 gal/yr/1000 lbs body weight volume 250642.5

Total 250642.5 gallons per year raw feces and urine

ASSUME from TABLE 10-1 and 10-2 of MWPS-18 80 Percent loss in lagoon system and 1 percent loss injection to get TABLE 10-1 70-80 percent loss in lagoons and TABLE 10-2 ~~15-35~~ ^{10%} loss for spray irrigation

*b2W 15863.27 PAN/YR

101.6876 acres needed to provide the acreage needed for an agronomic nitrogen application rate(corn @ 1

IF we use the more conservative estimates

24035.25 PAN/YR

154.0721 acres needed to provide the acreage needed for an agronomic nitrogen application rate

These values do not include any additional swine that might be present (i.e., gilts and boars)

1.3 lbs/acre/year		
They have 120 bu corn		
@ 120 bu/acre corn then application rate for N is	156 lbs N/acre	50
		50
		50

ember	Total*
fall growth desired	0
	0
	0
	156
	0

From: Dan Heacock
To: REGDO1.PEOP01.EPA1113
Date: 7/16/98 3:09pm
Subject: JK Pork draft letter

I have reviewed the partial plan prepared by NRCS dated September 5, 1997. It differs from the plan submitted by Carlisle in October, 1997. I did not do a complete review of the Sept. plan since they may not use it.

As far as the problems from your visit in May, these should be handled in a VN or NCA, whatever. If they get resolved before the permit is issued ok. If not we will handle that at that time, possibly by permit condition. I will know more on this when I see your memo on the visit.

Did the facility proceed with any of their expansion plans at this site since your previous visits or October 30, 1997? In my e-mail of 2/6/98 I asked about the clean water diversion plan required by the August 6, 1997 court order. What is this status on this plan?

Please advise if you have any comments on this letter.

Dan

CC: EPA1177

Summary of Livestock Waste Land Application - JK Pork

Table 1 Page 17 of Subtitle E

Swine produce 0.045 lb/day N per 100 lbs body weight

Table 2 Page 17 of Subtitle E Anaerobic Lagoon

10-15 lbs N per 1000 gallons

Table 10-4 of MWPS-18 (1993) land application of manure

For irrigation from lagoons 61.2 acres/100 sows to get 100 lbs N/acre/year using 48 *1.275 due to injection
 For irrigation from anaerobic pit 155 acres/100 sows to get 100 lbs N/acre/year

Table 10-7 of MWPS-18

	Anaerobic lagoon	Liquid pit
lbs of NH4-N/1000 gallons	4	24
lbs of TKN-N/1000 gallons	5	36

Using table 1 data for anaerobic lagoons

Total swine poundage = 659625 lbs
 108343.4 lbs N/year produced

Agronomic Nitrogen Demand 156 lbs PAN/Acre Based on corn at 120 bu/acre

694.509 acres needed for land application

MWPS-18 TABLE 10-4 These values include storage and application losses

Assuming 156 lbs N/acre

600 sows

596 acres needed for land application from pits
235 acres needed for land application from lagoon

CROP	ACREAGE	Total N Uptake(lbs)
Alfalfa	14.4	2246.4
Tall Fescue	28.8	0
Orchard Grass	28.8	0
	72 Total	2246.4
Corn	13	2028
Soybeans	74	11544
Alfalfa	40	6240
Fescue	15	0
Orchard grass	12	0
	154 Total	19812

MWPS-18, 1993

TABLE 2-1

	weight(lbs)	lb/day N	gal/day
Swine			
Nursery pig	35	0.02	0.3
Growing pig	65	0.03	0.5
Finishing pig	150	0.07	1.2
	200	0.09	1.6
Gestating Sow	275	0.07	1.1
Sow and Litter	375	0.1	2.7
Boar	350	0.09	1.4
Gilt*	200	0.09	1.6

*Gilt is assumed to be the same as finishing pig

These ratios of pigs obtained from page 6 of the October 29, 1997 waste management plan

		Total N (lbs/day)	Volume(g)
Farrowing Sows	75	28125	7.5
Gestating Sows	525	144375	36.75
Nursery Pigs	750	26250	15
Growing pigs	1275	82875	38.25
Gilts	150	30000	13.5
Finishing pigs	2320	348000	162.4
Total		659625	273.4

Total N per year 99791 Total Volume per year = 1703273 gallons

Using Subtitle E Data

Nitrogen 108343.4 Lbs N/yr produced by animals
 Volume 2407631 gallons per year produced by animals

**MWPS-18, 1993
 table 10-8**

		volume
Breeding	1453 gal/yr/1000 lbs body weight	250642.5
Total		250642.5 gallons per year raw feces and urine

ASSUME from TABLE 10-1 and 10-2 of MWPS-18 80 Percent loss in lagoon system and 1 percent loss injection to get TABLE 10-1 70-80 percent loss in lagoons and TABLE 10-2 15-35 loss for spray irrigation

19758.62 PAN/YR

126.6578 acres needed to provide the acreage needed for an agronomic nitrogen application rate @ 1

IF we use the more conservative estimates

29937.3 PAN/YR

191.9058 acres needed to provide the acreage needed for an agronomic nitrogen application rate

These values do not include any additional swine that might be present (i.e., gilts and boars)

1.3 lbs/acre/year		
They have 120 bu corn		
@ 120 bu/acre corn then application rate for N is	156 lbs N/acre	50
		50
		50

	Total*
ember	0
fall growth desired	0
	0
	156
	0

Summary of Livestock Waste Land Application - JK Pork

Table 1 Page 17 of Subtitle E

Swine produce 0.045 lb/day N per 100 lbs body weight

Table 2 Page 17 of Subtitle E Anaerobic Lagoon

10-15 lbs N per 1000 gallons

Table 10-4 of MWPS-18 (1993) land application of manure

For ~~irrigation~~ ^{injection} from lagoons 61.2 acres/100 sows to get 100 lbs N/acre/year using 48 *1.275 due to injection
 For ~~irrigation~~ ^{injection} from anaerobic pit 155 acres/100 sows to get 100 lbs N/acre/year

Table 10-7 of MWPS-18

	Anaerobic lagoon	Liquid pit
lbs of NH4-N/1000 gallons	4	24
lbs of TKN-N/1000 gallons	5	36

Using table 1 data for anaerobic lagoons

Total swine poundage = 507875 lbs
 83418.47 lbs N/year produced

Agronomic Nitrogen Demand 156 lbs PAN/Acre Based on corn at 120 bu/acre

534.7338 acres needed for land application

MWPS-18 TABLE 10-4 These values include storage and application losses

Assuming 156 lbs N/acre

600 sows

596 acres needed for land application from pits
235 acres needed for land application from lagoon

CROP	ACREAGE	Total N Uptake(lbs)
Alfalfa	14.4	2246.4
Tall Fescue	28.8	0
Orchard Grass	28.8	0
	72 Total	2246.4
Corn	13	2028
Soybeans	74	11544
Alfalfa	40	6240
Fescue	15	0
Orchard grass	12	0
	154 Total	19812

MWPS-18, 1993

TABLE 2-1

	weight(lbs)	lb/day N	gal/day
Swine			
Nursery pig	35	0.02	0.3
Growing pig	65	0.03	0.5
Finishing pig	150	0.07	1.2
	200	0.09	1.6
Gestating Sow	275	0.07	1.1
Sow and Litter	375	0.1	2.7
Boar	350	0.09	1.4
Gilt*	200	0.09	1.6

MCS
600 Sows
150 Gilts
720 + 1600 Crowns
750 Nursery

*Gilt is assumed to be the same as finishing pig

These ratios of pigs obtained from page 6 of the October 29, 1997 waste management plan

			Total N (lbs/day)	Volume(g)
Farrowing Sows	<i>600 Sows</i> 75	28125 <i>1.1</i>	7.5	202.5
Gestating Sows	<i>150 Gilts</i> 525	144375 <i>1.2</i>	36.75	577.5
Nursery Pigs	<i>750</i> 1750	61250 <i>3</i>	35	
Growing pigs	<i>720</i> 1275	82875 <i>5</i>	38.25	
Finishing pigs	1275	191250 <i>1.1</i>	89.25	

Total 507875 206.75 780

Total N per year 75463.75 Total Volume per year = 284700 gallons

Using Subtitle E Data

Nitrogen 83418.47 Lbs N/yr produced by animals
 Volume 1853744 gallons per year produced by animals

**MWPS-18, 1993
 table 10-8**

		volume
Breeding	1453 gal/yr/1000 lbs body weight	250642.5
Total		<u>250642.5</u> gallons per year raw feces and urine

ASSUME from TABLE 10-1 and 10-2 of MWPS-18 80 Percent loss in lagoon system and 1 percent loss injection to get TABLE 10-1 70-80 percent loss in lagoons and TABLE 10-2 15-35 loss for spray irrigation

14941.82 PAN/YR

95.78091 acres needed to provide the acreage needed for an agronomic nitrogen application rate(corn @ 1

IF we use the more conservative estimates

22639.13 PAN/YR

145.1226 acres needed to provide the acreage needed for an agronomic nitrogen application rate

These values do not include any additional swine that might be present (i.e., gilts and boars)

1.3 lbs/acre/year		
They have 120 bu corn		50
@ 120 bu/acre corn then application rate for N is	156 lbs N/acre	50
		50

	Total*
ember	0
fall growth desired	0
	0
	156
	0

HANCOCK COUNTY
 JERRY GRAUF SWINE FARM

E09

UNITED STATES
 DEPARTMENT OF
 AGRICULTURE

NATURAL RESOURCES
 CONSERVATION
 SERVICE

Prairie Hills
 RCD Office
 E. Jackson St.
 Macomb, IL
 61455

September 5, 1997

Jerry Grauf
 Box 77
 Elvaston, IL 62334

~~Mr. Carlisle~~
 2041 N. county Road 1800
 Carthage, IL 62321

Dear Mr. Grauf and Mr. Carlisle,

I am writing to you concerning your animal waste system located in Hancock County - Illinois just southeast of the town of Elvaston. On August 28, 1997 Jim Evans - NRCS, State Agricultural Engineer, Champaign; Steve Hobson - NRCS, Zone Engineer, Macomb; and landowner and operator Jerry Grauf and Dan Carlisle all met at the animal waste site to discuss future operations and maintenance plans.

The swine operation consists of:

North side of gravel Road - 2 concrete lot approx. 220' x 230' with roof area of 25% and an approximately 3 acre surface area manure holding pit (Pit#1) and 1 acre of grassed area leading to the pit.

South side of gravel road - 2-Cargill Units 150' x 73', 1-Cargill Unit 150' x 50' and a nursery and sow building in confinement. 2 manure holding pits (Pits #2 #3) with surface area of both totaling approximately 2 acres.

Future expansion of several confinement buildings on the south side of gravel road is planned.

Animal Numbers and Manure Production

Contributing to North holding pit (Pit #3)	1,000 lb. Animal Units	Animal Units per LMF Aor
720 Growers 80#-260#(N Lot)	122.4	288
150 Gilts 80#-260# (N Lot)	25.5	60
600 Sows 400# (Sow Bldg.)	240	240
750 Nursery Pigs 10-80#(Nursery)	33.75	22.5
	421.65	610.5

Manure Volume / 365 days = 158,649 cu.ft. (1,190,000 gal.)

Waste water

(assume 0.5 gal/150 lb pig) = 68,575 cu. ft. (513,000 gal.)

Runoff = 106,810 cu. ft. (800,000 gal.)

Page 2
 September 5, 1997
 Jerry Grauf and Dan Carlisle
 Animal Waste System

Total Yearly Volume to Pit #1 = 334,034 cu. ft. (2,500,000 gal.)

25 Year Rainfall (6")
 (43,560 + 50,600 + 130,680) sq. ft. = 112,420 cu. ft. (841,000 gal.)

For Pit #3, the minimum draw down depth from the lowest point of the top of dam is 7.8 feet to be the level emptied down to by late fall (October 31). The minimum draw down depth is designed to accommodate 365 days of manure production, waste water of 0.5 gallons/ 150 lb of pig, runoff of 12 inches from soil and 15 inches from concrete lot area draining to Pit #3, 2-25 year (6") storms and 6" of net accumulation of precip-evap. The start pump elevation shall be at the depth of 2.75 feet from top of dam, where draw down must be started immediately and should be reflected in a landowner Emergency Action Plan. The Emergency Plan should specify methods to remove material from Pit #3 in a very short time frame (suggest 2 days) and location areas for application.

Contributing to both South holding pits (Pits #1 #2)

	<u>1,000 lb</u> <u>Animal Units</u>	<u>Animal Units</u> <u>per LME Act</u>
500 Growers (Cargill) 120#-260#	95	200
500 Growers (Cargill) 120#-260#	95	200
600 Growers (Cargill) 90#-120#	63	240
	<u>253</u>	<u>640</u>
Manure Volume/365 days	= 92,348 cu. ft. (691,000 gal.)	
Wastewater		
Assume 0.5 gal/150 lb pig)	= 41,148 cu. ft. (308,000 gal.)	
Runoff	= <u>71,250 cu. ft. (533,000 gal.)</u>	

Total Yearly Volume to Pit #2 #3 = 204,746 cu. ft. (1,532,000 gal.)

25 Year Rainfall (6")
 (15,000+45,000+87,120) sq. ft. = 73,560 cu.ft. (550,000 gal.)

For Pit #1 #2, the minimum late fall draw down depth is 7.5 feet below top of dam. Start pump level and start Emergency Action Plan level is 2.75 feet below top of dam. It is recommended that depth gauges on Pit #3 and Pit #2 be installed to at least 7.8 and 7.5 feet respectively. Existing is a staff gauge on Pit #3 that measures 3 feet of depth.

The effects of guttering on all the buildings in the North lot leading to Pit #3 (3 ac.) is that using 15" of runoff and 2-25 year storms totalling 27" would equate to a potential reduction of 28,500 cu. ft. (213,000 gal.) of runoff or 0.3 feet of depth over the 3 acre surface of Pit #3.

Page 3
 September 5, 1997
 Jerry Grauf and Dan Carlisle
 Animal Waste System

Waste Utilization Plan

I will provide calculations and recommendations for the following:

1. Acres needed to utilize nutrients in tests from Pit #3 on 7/8/97 for P205.
 2. Acres needed to balance to NRCS specifications for P205 for all animals currently on site.
 3. Sludge Removal/Agitation of Pits.
 given a crop rotation of corn-corn-soybeans,
 corn yield = 150 bu/acre soybeans = 45 bu/acre
 Maintenance needs for 150 bu/acres corn -(P205-64#), (K20-42#)
 Maintenance needs for 45 bu/acre soybeans (P205-38#), (K20-58.5#)
 Based on University of Illinois, Illinois Agronomy Handbook
1. Tests taken as of 7/8/97 on supernatant of Pit #3:
 2.6 lbs. N / 1,000 gallon
 1.0 lbs. P / 1,000 gallon = 2.288 lbs P205/1000 gal.
 5.3 lbs. K / 1,000 gallon = 6.39 lbs. K20/1000 gal.

To balance crop maintenance of P205 requires 24,000 gallons per acre application rate. This rate equates to about 27 acres for 1.0 foot of liquid from the 3 acres Pit #3.

2. Using the total number of animals currently on site, to balance P205 produced by animals with the crop maintenance needs of the rotations specified would require 1,300 acres assuming a 20% loss of P205, which is also what the Minnesota Cooperative Extension Service computer program (MAP - Manure Application Planner) also assumes that is used widely in Illinois.
3. Nutrient tests on the existing sludge should be completed, since it will be much more concentrated than the supernatant off the top of the pit, and needs to be included in a complete waste management plan.

The current number of cropland acres for utilizing manure was stated to be about 420. More cropland base is needed to balance manure produced P205 with crop maintenance requirements. Proposed expansion of new confinement facilities would require additional crop acreage to meet NRCS Waste Utilization Standards.

Future plans for the North lot was to remove hogs from those facilities. While animals are still located on the North lot, a proposed berm and pipe was discussed to be located near the Northeast corner of the lot along with a fresh water diversion located to the North that would divert water to the cropland to the East.

I have provided to you the book values for waste produced and crop needs, but these numbers will vary from actual soil tests and manure tests.

Page 4
September 5, 1997
Jerry Grauf and Dan Carlisle
Animal Waste System

We are willing to assist you in providing a complete Manure Waste Utilization Plan for current operations, if sludge and soil tests can be completed.

If you have any questions, please contact Lori Bollin, District Conservationist at the Carthage Field Office at (217) 357-2180.

Sincerely,



Steven L. Hobson, P.E.
Zone Engineer

cc: Jim Evans, State Agricultural Engineer, Champaign
Lori Bollin, District Conservationist, Carthage

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To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

Page 5
Jerry Grauf and Dan Carlisle
September 5, 1997
Animal Waste System

RECOMMENDED ACTIONS

....Drawdown pit levels to be down by end of Fall (October 31) to depths specified.

....1 year storage volume by achieving fall draw down levels.

Depth gauges installed on 2 pits (Pit# 3, Pit #2) to specified depths.

....Guttering of buildings in North lot.

....Waste Utilization Plan using existing tests of supernatant.

....Plan prior to hogs being removed from lot on North side of gravel road.

(Pipe to Pit #3 from NE of North lot and fresh water diversion to cornfield).

(Rock lined road ditch from concrete lot after hogs removed from North lot.

....Emergency Action Plan.

....Complete Waste utilization for all animals as manure produced for balancing P205 to crop maintenance requirements.

Sludge removal/agitation of pits and testing of Nutrient content.

cc: - Chuck Gunnarson

- Tom Davis

- Dan Heacock, Permits

10-3-97

HANCOCK COUNTY
JERRY GRAUF SWINE FARM

EDF

UNITED STATES
DEPARTMENT OF
AGRICULTURE

NATURAL RESOURCES
CONSERVATION
SERVICE

Prairie Hills
RCD Office

E. Jackson St.
Macomb, IL
61455

September 5, 1997

Jerry Grauf
Box 77
Elvaston, IL 62334

~~Dan Carlisle~~
2041 N. county Road 1800
Carthage, IL 62321

Dear Mr. Grauf and Mr. Carlisle,

I am writing to you concerning your animal waste system located in Hancock County - Illinois just southeast of the town of Elvaston. On August 28, 1997 Jim Evans - NRCS, State Agricultural Engineer, Champaign; Steve Hobson - NRCS, Zone Engineer, Macomb; and landowner and operator Jerry Grauf and Dan Carlisle all met at the animal waste site to discuss future operations and maintenance plans.

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South side of gravel road - 2-Cargill Units 150' x 73', 1-Cargill Unit 150' x 50' and a nursery and sow building in confinement. 2 manure holding pits (Pits #2 #3) with surface area of both totaling approximately 2 acres.

Future expansion of several confinement buildings on the south side of gravel road is planned.

Animal Numbers and Manure Production

Contributing to North holding pit (Pit #3)	1,000 lb. Animal Units	Animal Units per LME Aot
720 Growers 80#-260#(N Lot)	122.4	288
150 Gilts 80#-260# (N Lot)	25.5	60
600 Sows 400# (Sow Bldg.)	240	240
750 Nursery Pigs 10-80#(Nursery)	<u>33.75</u>	<u>22.5</u>
	421.65	610.5

Manure Volume / 365 days = 158,649 cu.ft. (1,190,000 gal.)

Waste water

(assume 0.5 gal/150 lb pig) = 68,575 cu. ft. (513,000 gal.)

Runoff = 106,810 cu. ft. (800,000 gal.)

Waste Utilization Plan

I will provide calculations and recommendations for the following:

1. Acres needed to utilize nutrients in tests from Pit #3 on 7/8/97 for P205.
 2. Acres needed to balance to NRCS specifications for P205 for all animals currently on site.
 3. Sludge Removal/Agitation of Pits.
given a crop rotation of corn-corn-soybeans,
corn yield = 150 bu/acre soybeans = 45 bu/acre
Maintenance needs for 150 bu./acres corn -(P205-64#), (K20-42#)
Maintenance needs for 45 bu/acre soybeans (P205-38#), (K20-58.5#)
Based on University of Illinois, Illinois Agronomy Handbook
1. Tests taken as of 7/8/97 on supernatant of Pit #3:
2.6 lbs. N / 1,000 gallon
1.0 lbs. P / 1,000 gallon = 2.288 lbs P205/1000 gal.
5.3 lbs. K / 1,000 gallon = 6.39 lbs. K20/1000 gal.

To balance crop maintenance of P205 requires 24,000 gallons per acre application rate. This rate equates to about 27 acres for 1.0 foot of liquid from the 3 acres Pit #3.

2. Using the total number of animals currently on site, to balance P205 produced by animals with the crop maintenance needs of the rotations specified would require 1,300 acres assuming a 20% loss of P205, which is also what the Minnesota Cooperative Extension Service computer program (MAP - Manure Application Planner) also assumes that is used widely in Illinois.
3. Nutrient tests on the existing sludge should be completed, since it will be much more concentrated than the supernatant off the top of the pit, and needs to be included in a complete waste management plan.

The current number of cropland acres for utilizing manure was stated to be about 420. More cropland base is needed to balance manure produced P205 with crop maintenance requirements. Proposed expansion of new confinement facilities would require additional crop acreage to meet NRCS Waste Utilization Standards.

Future plans for the North lot was to remove hogs from those facilities. While animals are still located on the North lot, a proposed berm and pipe was discussed to be located near the Northeast corner of the lot along with a fresh water diversion located to the North that would divert water to the cropfield to the East.

I have provided to you the book values for waste produced and crop needs, but these numbers will vary from actual soil tests and manure tests.

Page 5
Jerry Grauf and Dan Carlisle
September 5, 1997
Animal Waste System

RECOMMENDED ACTIONS

....Drawdown pit levels to be down by end of Fall (October 31) to depths specified.

....1 year storage volume by achieving fall draw down levels.

Depth gauges installed on 2 pits (Pit# 3, Pit #2) to specified depths.

....Guttering of buildings in North lot.

....Waste Utilization Plan using existing tests of supernatant.

....Plan prior to hogs being removed from lot on North side of gravel road.

(Pipe to Pit #3 from NE of North lot and fresh water diversion to cornfield).

(Rock lined road ditch from concrete lot after hogs removed from North lot.

....Emergency Action Plan.

....Complete Waste utilization for all animals as manure produced for balancing P205 to crop maintenance requirements.

Sludge removal/agitation of pits and testing of Nutrient content.

CC: - Chuck Gunnarson

10-3-97

- Tom Davis

- Dan Heacock, Permits

**JK PORK INC
2041 N COUNTY ROAD 1800
CARTHAGE IL 62321
217-746-8691**

RECEIVED
MAR 18 1999
Watershed Management Section
BUREAU OF WATER

March 17, 1999

IEPA
1021 North Grand Avenue East
P O Box 19276
Springfield IL 62794-9276
Attn: Dan Heacock, Permit Section, and Division of Water Pollution Control

RE: JK Pork Inc - NPDES Permit No IL 0072648
2041 N County Road 1800
Carthage IL 62321
Phone: 217-746-8691/Fax 217-74605471

Dear Mr. Heacock,

I have enclosed the additional information that you have requested in regard to our NPDES permit.

1. The feeding floor north of the gravel road, adjacent to lagoon #1 is no longer in use. The capacity of this floor was 720 head. The gilt developer on the East Side of this floor is still in use. It contains 150 head. We will discontinue using this gilt developer during the summer of 1999. The concrete Cargill floors east of the lagoon #2 and #3 will also be closed during the summer of 1999.
2. Aerial maps are enclosed with the location and acreage of each land application area.
3. Land applications will be made with an umbilical system. The manure will be injected into the soil. Applications may also be made with a manure tank equipped with an injection system.
4. Soil survey maps have been enclosed along with soil descriptions.
5. The slope of application sites is included with soil descriptions.
6. Water table information is included with the soil descriptions list.
7. Waterways and streams are included on the maps that indicate application sites and acreage.
8. A map is included on the map of the facilities and lagoon.
9. Storm water diversions are included on the map of the lagoons and facilities.
10. Dimensions and elevations of the facilities and lagoons are included on the map of facilities and lagoons. The volumes are also included with this map.
11. A work sheet has been included showing the values and calculations used to determine application rates. An actual test of the manure is also included. Withdrawal sites are included on the map of the facilities and lagoons. Five-year yield data is also included.
12. Plans dated September 5, 1997 were used.

If you have, any questions feel free to contact me at the address or telephone number listed above.

Sincerely,



Dan Carlisle
President

Application Guidelines

In lea of calculating the manure value for the lagoons, we have used the actual test for justification of the gallons to apply

Using USDA figures we have a total of 4,032,000 gallons of waste per year (see following pages)

Tests show

	.83 N	+ .83 P ₂ O ₅	+ 4.15 K ₂ O North #1
	3.32 N	+ .83 P ₂ O ₅	+ 4.98 K ₂ O South # 2 & #3
Total N	4.15	1.66	9.13
Average N	2.01	.83 P ₂ O ₅	+ 4.56 K ₂ O

ñ lbs. per 1000 gallon

removal for 150 bu corn 180-64-42

removal for 50 bu corn 45-42-65

ñ assuming SB produces 80% of there own N

Manure application on Corn 9,210 gallon using K₂O as limiting factor

Manure application on SB 14,250 gallon using K₂O as limiting factor

4,032,000 divide 9,210 = 438 acres needed of corn or

4,032,000 divide 14,250 = 283 acres needed of SB

Acres target Jerry has 300 acres

Have 61 acres

Mark Wright 142 acres

503 acres total

Corn yield

Year	Acres	Bushels
1994	944	170
1995	952	104.5
1996	700	127.9
1997	1267	158.3
1998	631	140



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Referee Chemist, American Oil Chemists' Society
Approved Chemist, American Oil Chemists' Society

MANURE MANAGEMENT REPORT

Dealer Name:



Producer:

NORTH LAGOON

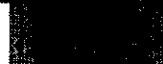


Lab. Number:



Date Received

Date Reported:



Account No.:

ANALYSIS RESULTS

	% Moisture	% NITROGEN	% P2O5	%K2O
AS RECEIVED BASIS:				
100% DRY MATTER BASIS:	0	10.00	10.00	50.00
POUNDS PER 1000 GALLONS:		0.83	0.83	4.15
1st year availability*	LBS./1000 GAL.	0.42	0.58	2.91

APPLICATION GUIDE

NUTRIENTS NEEDS	(Based on ITL soil test)		
	(Requireme for 150 Bu. Corn Crop)		
	180	90	185
Gallons required for each nutrient need (8.3lbs./Gallon)	433,700	154,900	63,700
Maximum Rate(Gallons)	433,700		
Minimum Rate(Gallons)	63,700		
Value per 1000 gallons of each Nutrient**	N-Price**	P-Price**	K-Price**
	\$0.18	\$0.25	\$0.12
	\$0.07	\$0.15	\$0.35

If the manure is to be used as a complete fertilizer select the highest of the three values as the application rate. For maximum use and efficiency, select the lowest of the values and supplement with commercial fertilizer.

First Year Value**	
Value/1000 Gallons	\$0.57
Cost of Application	Unknown
Net Value/ 1000 gallons	\$0.57
Net Value/ Acre Max. Rate	\$246.58
Net Value/ Acre Min. Rate	\$36.22
	180
	252
	1260
	26
	37
	185
	150
	50
	0

NUTRIENTS APPLIED AT MAXIMUM RATE
 NUTRIENTS APPLIED AT MINIMUM RATE
 SUPPLEMENTED NUTRIENTS NEEDED***

* The availability of nutrients will depend on how often and application methods. For information only, the above 1st year availability is using the following: N=50%; P2O5 =70% and K2O = 70%. When filling out your MANURE MANAGEMENT PLAN, use the percentages for your specific application as stated in the PLAN. Because of various uncontrolled factors in manure handling, application, and other conditions, Iowa Testing Laboratories, Inc. does not assume the liability for crop yield. However, Iowa Testing Laboratories, Inc. does recommend the Iowa State University Late Spring Nitrate Soil Test for nitrogen availability on all manure applied ground.

** Value would change with the price of commercial fertilizer materials.

*** At minimum application rate only.

Bruce Duesterhaus Home 217-432-5625
 mobile 217-257-8099



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American Feed Industry Association
National Hay Association
The Agribusiness Association of Iowa

Referee Chemist, American Oil Chemists' Society
Approved Chemist, American Oil Chemists' Society

MANURE MANAGEMENT REPORT

South LA GOON

Dealer Name: [REDACTED]

Producer: [REDACTED]

Lab. Number: [REDACTED]
Account No.: [REDACTED]

Date Received: [REDACTED]
Date Reported: [REDACTED]

ANALYSIS RESULTS

	% Moisture	% NITROGEN	% P2O5	%K2O
AS RECEIVED BASIS:	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
100% DRY MATTER BASIS:	0	20.00	5.00	30.00
POUNDS PER 1000 GALLONS:		3.32	0.83	4.98
1st year availability*	LBS./1000 GAL.	1.66	0.58	3.49

APPLICATION GUIDE

NUTRIENTS NEEDS (Based on ITL soil test) (Requireme for 150 Bu. Corn Crop)	[REDACTED]		
	180	90	185
Gallons required for each nutrient need (8.3lbs./Gallon)	108,400	154,900	53,100
Maximum Rate(Gallons)	154,900		
Minimum Rate(Gallons)	53,100		
Value per 1000 gallons of each Nutrient**			
	N-Price**	P-Price**	K-Price**
	\$0.18	\$0.25	\$0.12
	\$0.30	\$0.15	\$0.42

If the manure is to be used as a complete fertilizer select the highest of the three values as the application rate. For maximum use and efficiency, select the lowest of the values and supplement with commercial fertilizer.

First Year Value**	
Value/1000 Gallons	\$0.86
Cost of Application	Unknown
Net Value/ 1000 gallons	\$0.86
Net Value/ Acre Max. Rate	\$133.58
Net Value/ Acre Min. Rate	\$45.79
	257
	90
	540
	88
	31
	185
	90
	60
	0

NUTRIENTS APPLIED AT MAXIMUM RATE
NUTRIENTS APPLIED AT MINIMUM RATE
SUPPLEMENTED NUTRIENTS NEEDED***

* The availability of nutrients will depend on how often and application methods. For information only, the above 1st year availability is using the following: N=50%; P2O5 =70% and K2O = 70%. When filling out your MANURE MANAGEMENT PLAN, use the percentages for your specific application as stated in the PLAN. Because of various uncontrolled factors in manure handling, application, and other conditions, Iowa Testing Laboratories, Inc. does not assume the liability for crop yield. However, Iowa Testing Laboratories, Inc. does recommend the Iowa State University Late Spring Nitrate Soil Test for nitrogen availability on all manure applied ground.

** Value would change with the price of commercial fertilizer materials.

*** At minimum application rate only.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1983 - 1986 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

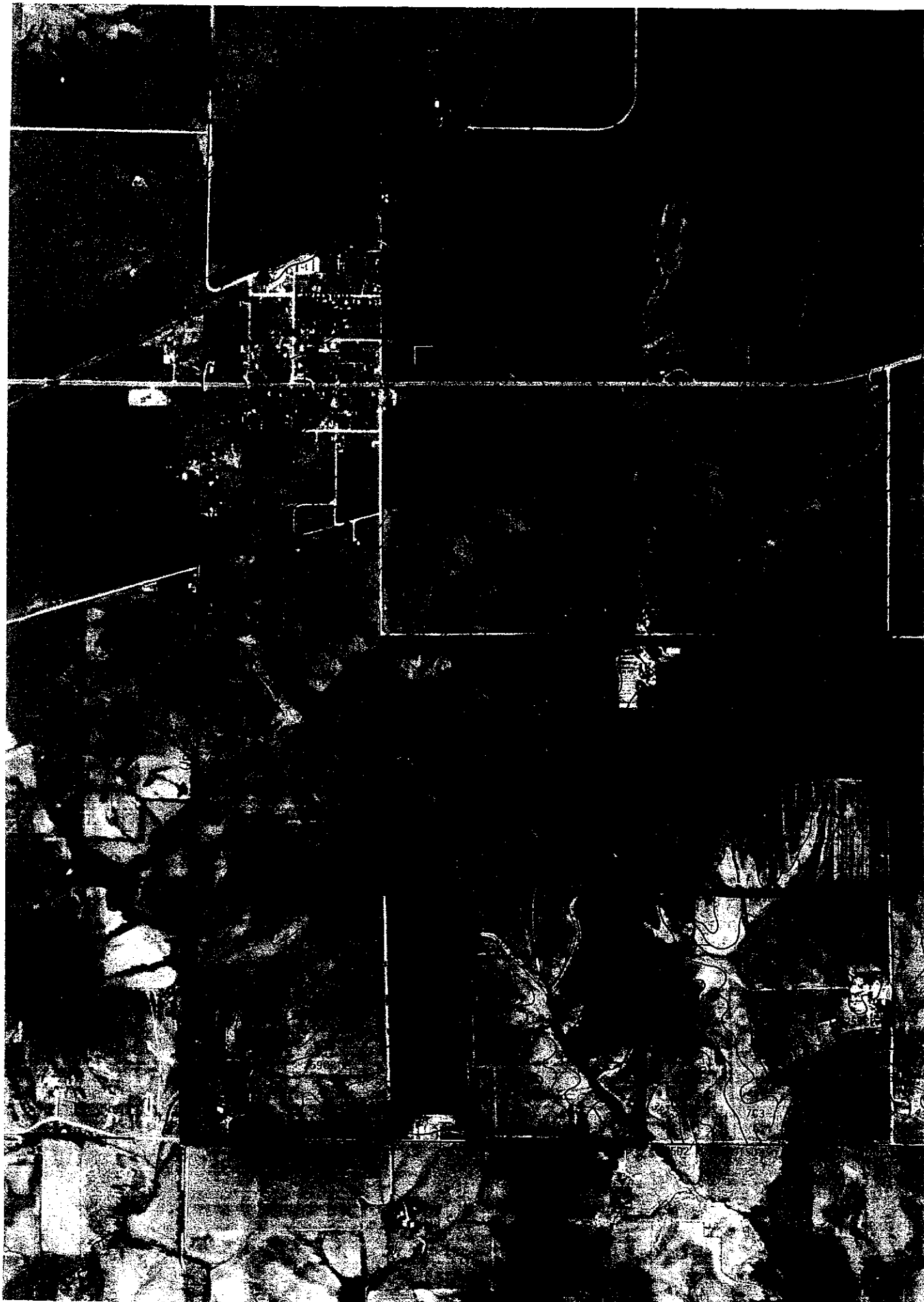


TABLE A.--AGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Depth to Water table	Acres	Percent
6C2	Fishhook silt loam, 5 to 10 percent slopes, eroded	1-3' perched	15,780	3.0
7C3	Atlas silty clay loam, 5 to 10 percent slopes, severely eroded	1-2' perched	3,920	0.8
8D2	Hickory loam, 10 to 18 percent slopes, eroded		5,340	1.0
8F	Hickory loam, 18 to 30 percent slopes		28,710	5.5
8G	Hickory loam, 30 to 60 percent slopes		4,010	0.8
17A	Keomah silt loam, 0 to 2 percent slopes		7,870	1.5
17B	Keomah silt loam, 2 to 5 percent slopes		1,400	0.3
17B2	Keomah silt loam, 2 to 5 percent slopes, eroded		10,050	1.9
36B	Tama silt loam, 2 to 5 percent slopes		3,200	0.6
36B2	Tama silt loam, 2 to 5 percent slopes, eroded		3,690	0.7
37A	Worthen silt loam, 0 to 2 percent slopes		590	0.1
37B	Worthen silt loam, 2 to 5 percent slopes		610	0.1
41A	Muscataine silt loam, 0 to 2 percent slopes		20,140	3.9
41B2	Muscataine silt loam, 2 to 5 percent slopes, eroded		7,520	1.4
43A	Ipava silt loam, 0 to 2 percent slopes	1-2' apparent	47,130	9.0
43B	Ipava silt loam, 2 to 5 percent slopes	1-3' apparent	670	0.1
43B2	Ipava silt loam, 2 to 5 percent slopes, eroded	1-3' apparent	24,380	4.7
46A	Herrick silt loam, 0 to 2 percent slopes	1-3' apparent	22,800	4.4
50	Virden silty clay loam	5-8' apparent	38,940	7.5
61A	Atterberry silt loam, 0 to 2 percent slopes		4,290	0.8
61B2	Atterberry silt loam, 2 to 5 percent slopes, eroded		4,730	0.9
68	Sable silty clay loam		10,280	2.0
88B	Sparta loamy fine sand, 1 to 5 percent slopes		1,150	0.2
112	Cowden silt loam	5-8' apparent	7,830	1.5
119C2	Elco silt loam, 5 to 10 percent slopes, eroded		3,980	0.8
134B	Camden silt loam, 2 to 5 percent slopes		1,310	0.3
134C2	Camden silt loam, 5 to 10 percent slopes, eroded		430	0.1
138	Shiloh silty clay		1,020	0.2
250D2	Velma loam, 10 to 15 percent slopes, eroded		880	0.2
257A	Clarksdale silt loam, 0 to 2 percent slopes	1-3'	18,990	3.6
257B	Clarksdale silt loam, 2 to 5 percent slopes		570	0.1
257B2	Clarksdale silt loam, 2 to 5 percent slopes, eroded	1-3'	22,530	4.3
259C2	Assumption silt loam, 5 to 10 percent slopes, eroded	2.5-4.5' perched	5,110	1.0
268B	Mt. Carroll silt loam, 2 to 5 percent slopes		270	0.1
274A	Seaton silt loam, 0 to 2 percent slopes		340	0.1
274B	Seaton silt, 2 to 5 percent slopes		2,980	0.6
274C2	Seaton silt loam, 5 to 10 percent slopes, eroded		2,430	0.5
274D3	Seaton silt loam, 10 to 18 percent slopes, severely eroded		970	0.2
278A	Stronghurst silt loam, 0 to 2 percent slopes		830	0.2
279B	Rozetta silt loam, 2 to 5 percent slopes		28,390	5.4
279C2	Rozetta silt loam, 5 to 10 percent slopes, eroded		19,820	3.8
280D2	Fayette silt loam, 10 to 18 percent slopes, eroded		2,740	0.5
379B	Dakota loam, 1 to 5 percent slopes		240	"
386B	Downs silt loam, 2 to 5 percent slopes	7-8'?	9,130	1.8
417G	Derinda silt loam, 30 to 60 percent slopes		1,160	0.2
440B	Jasper loam, 1 to 5 percent slopes		470	0.1
440C2	Jasper fine sandy loam, 5 to 10 percent slopes, eroded		300	0.1
470C2	Keller silt loam, 5 to 12 percent slopes, eroded		12,990	2.5
516	Faxon silty clay loam		50	"
605E3	Ursa clay loam, 15 to 22 percent slopes, severely eroded		4,160	0.8
647A	Lawler clay loam, bedrock substratum, 3 to 2 percent slopes		250	"
660C3	Coatsburg silty clay loam, 5 to 10 percent slopes, severely eroded		1,710	0.3
785C	Lacrescent silt loam, 5 to 10 percent slopes		140	"
785G	Lacrescent cobbly silt loam, 30 to 60 percent slopes		1,610	0.3
802B	Orthents, loamy, gently sloping		280	0.1
802F	Orthents, loamy, steep		210	"
864	Pits, quarries		180	"
874F	Dickinson-Hamburg complex, 10 to 60 percent slopes		330	0.1
915D2	Elco-Ursa complex, 10 to 15 percent slopes, eroded	2.5-4.5' perched	9,250	1.8
936F	Fayette-Hickory complex, 15 to 30 percent slopes		5,180	1.0
936G	Fayette-Hickory complex, 30 to 60 percent slopes		1,760	0.3
937F	Seaton-Hickory complex, 15 to 30 percent slopes		1,540	0.3
937G	Seaton-Hickory complex, 30 to 60 percent slopes		1,690	0.3

See footnote at end of table.

Taken from
Soil
Interpretation
records at
NRCS

From: Dan Heacock
To: REGDO1.PEOP01.EPA1113
Date: 2/6/98 3:21pm
Subject: JK Pork Review Letter

Attached is a review letter regarding the JK Pork facility. After you have reviewed the letter let me know if you have any comments or suggested changes. After your review I will advise Chuck Gunnarson of the letter before it is sent out and/or contact JK Pork. The questions 11(B....) regarding application rate calculations are more pertinent to the waste management plan submittal and may be waived for the permit review. I don't see any record of problems with waste application, except maybe more should waste should have been land applied to prevent discharge. These comments (application rate calculations) could be handled through enforcement. Also did we receive the clean water diversion plan (item 3 of the August 6 court order)and is this resolved.

Dan



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 Mary A. Gade, Director

217/782-0610

September 8, 1998

JK Pork, Inc.
c/o Dan Carlisle
2041 N. County Road 1800
Carthage, IL 62321

Re: JK Pork, Inc. - NPDES Permit No. IL0072648
Notice of Incomplete Submission

Dear Mr. Carlisle

The Application for Permit received October 30, 1997 and the waste management plan of October 29, 1997 for the above listed project have been reviewed and have been determined to be an incomplete submission for purposes of review towards the issuance of a NPDES Permit.

The following specific additional information must be submitted within 30 days in order that we may continue our review:

1. Please indicate any projected changes to the size of the operation pursuant to Section 502.201 of Subtitle E. If any changes are anticipated, provide an estimated schedule for those changes. Please provide details of any changes to the facility size or operations that are not covered by the submittal received by the Agency on October 30, 1997.
2. Please submit a plat map or USGS map indicating the location and acreage of each land application area proposed in the waste management plan.
3. Please provide a description of the equipment and methods for the land application of the livestock waste.
4. Please submit soil survey maps and soil descriptions from a soil survey for each land application site.
5. Provide the slope of each land application site.
6. Please indicate the depth to seasonal high or mean annual water table for each land application site.
7. Please depict on the maps of the land application sites the location of waterways, streams, lakes and other surface waters.

Page 3

J. Pork, Inc. - NPDES Permit No. IL0072648

Notice of Incomplete Submission

application rate (e.g., gallons/acre) of the livestock waste. Please revise the calculations indicating the application rate to be used.

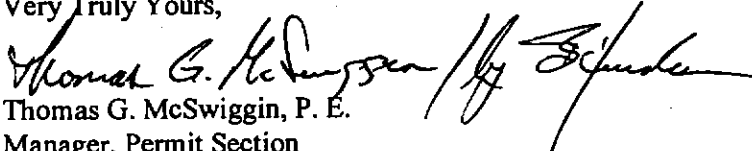
- F. Please indicate the points of withdrawal of the livestock waste from the livestock waste handling facilities (i.e., surface of lagoons, manure pits, etc.).

The Agency also has received a plan that was prepared by NRCS dated September 5, 1997. Please indicate if this plan will be used by your facility. If so, indicate the specific components that will be used so that the Agency can complete its review. Some components of the September, 1997 plan differ from the plan dated October 29, 1997. These differences would need to be resolved if both plans will be used.

If for any reason you cannot supply the above requested information within the time period allowed, please explain the reasons in writing and state when the information will be submitted. Failure to respond within the specified time period could be cause for Denial of your NPDES Permit. Include on all correspondence the above proposed NPDES Permit No.

If you have any questions or comments concerning the content of this letter, please contact Dan Heacock of my staff at the telephone number and address shown above.

Very Truly Yours,



Thomas G. McSwiggin, P. E.
Manager, Permit Section
Division of Water Pollution Control

TGM/DLH/jkporc2.doc

cc: DWPC/FOS Region 3
Chuck Gunnarson/DLC
Records Unit