APPENDIX D

√ **MANURE NUTRIENT MANAGEMENT CALCULATIONS**
√ **MANURE NUTIRENT BUDGET SUMMARY**
√ **MANURE ANALYTICAL RESULTS**

Manure Nutrient Management Calculations

Midwest Poultry Services, LP Hi-Grade Egg Producers Loda, Illinois

Date of Report: 24-Dec-08

Manure Nutrient Analyses

(results reported in lbs/dry tons)

	Layer Manure Barns 1-6	Layer Manure Barns 7-9	Layer Manure Barn 10	Layer Manure Average	
Date of samples:	12/23/2008	12/23/2008	12/23/2008	12/23/2008	
Number of samples:	1 Representative	1 Representative	1 Representative	3 Representative	
Moisture %	59.18%	56.09%	29.23%	29.47%	
Total Nitrogen	31.60	33.70	69.30	33.63	
Ammonia N (NH4-N)	9.10	14.20	6.50	5.20	
Organic N	22.40	19.60	62.80	28.40	
Available N	11.83	13.63	23.19	11.68	
Phosphorus as P2O5	31.40	36.80	43.80	25.07	
Potassium as K2O	27.50	29.70	37.30	21.60	
Estimated annual production	6,818	8,437	5,518	20,773	Total Tons

Total Nutrients Contained in Manure (annual production):

Total Nitrogen	215,453	284,325	382,372	882,150	total pounds
Ammonia Nitrogen	62,045	119,804	35,865	217,714	total pounds
Organic Nitrogen	152,726	165,364	346,507	664,597	total pounds
Available Nitrogen	80,682	114,987	127,979	323,648	total pounds
Phosphate as P2O5	214,090	310,479	241,672	766,241	total pounds
Potassium as K2O	187,499	250,577	205,808	643,883	total pounds

Available Nitrogen Calculations:	Layer Barns 1-6	Layer Barns 7-9	Layer Barn 10
Pounds of Ammonia N Lost During Storage and Handling: (25%, from Table 10-1, LWFH-MPS18)	2.28	3.55	1.63
Pounds of Ammonia N Remaining After Storage and Handling Losses:	6.83	10.65	4.88
Broadcast Application Losses: (30% of the Ammonia N left after S and H losses, table 10-2, LWFH-MPS 18)	2.05	3.20	1.46
Pounds of Ammonia Nitrogen Remaining After Storage and Broadcast Application Losses:	4.78	7.46	3.41
Pounds of Organic N Lost During Storage and Handling: (25%, from Table 10-1, LWFH-MPS18)	5.60	4.90	15.70
Pounds of Organic N Remaining After Storage and Handling Losses:	16.80	14.70	47.10
Broadcast Application Losses: (30% of the Organic N left after S and H losses, table 10-2, LWFH-MPS 18)	5.04	4.41	14.13
Pounds of Organic Nitrogen Remaining After Storage and Broadcast Application Losses: (ONRLA)	11.76	10.29	32.97
Total Lbs. of Organic Nitrogen Available First Year: (ONRLA * 60%)	7.06	6.17	19.78
Total Lbs. of Organic Nitrogen Available 2ndYear: (ONRLA * 60% * 50%)	3.53	3.09	9.89
Total Lbs. of Organic Nitrogen Available 3rd Year: (ONRLA * 60% * 25%)	1.76	1.54	4.95
Total Lbs. of Organic Nitrogen Available 4th Year: (ONRLA * 60% * 12.5%)	0.88	0.77	2.47
Total Pounds of Available Organic and Ammonia Nitrogen for Current Crop Year per Dry Ton:	11.83	13.63	23.19

MANURE NUTRIENT BUDGET SUMMARY

Crop Rotation & Nutrient Balance

Midwest Poultry Services, LP Hi-Grade Egg Producers Loda

Date of Report: 12/24/2008

	Layer Manure Barns 1-10 Average Manure Analysis & Total Manure Generation
Standard application rate/acre:	4 Tons
Total manure exported off farm (dry tons):	20,773
Total manure to apply/year (dry tons):	20,773
Total manure applied/year (dry tons):	0
Net (dry tons):	0

Crop Rotation:	Corn Grain	Soybeans	Wheat
Rotation Number of Years:	2	2	1
Acres of crop/year:	5,000	5,000	500
Yield, tons or bushels/acre:	150	45	70
Manure application rate prior to crop (T/A/Year)	4	0	0
Manure acres covered/year	5,193	0	0
Total manure Avail N lbs/a applied per year:	62	0	0
Annual total manure Avail N applied:	323,648	0	0
Total manure P2O5 lbs/a applied per year:	148	0	0
Annual total manure P2O5 applied:	766,241	0	0
Nitrogen lbs/acre removed/year:	135	171	89
Annual total lbs. Nitrogen removed:	675,000	855,000	44,450
P2O5 lbs/acre removed/year:	56	36	45
Annual total lbs. P2O5 removed:	277,500	180,000	22,400
Annual +/- Nitrogen	(351,352)	(855,000)	(44,450)
Annual +/- P2O5	488,741	(180,000)	(22,400)

Total Rotation years =	5
Lbs. Avail N Applied:	1,618,240
Lbs. P2O5 Applied:	3,831,204
Lbs. Nitrogen Removed:	(3,060,000)
Lbs. P2O5 Removed:	(937,400)
Net Nitrogen lbs/acre after full rotation =	(137)
Net P2O5 lbs/acre after full rotation =	276
Net soil test ppm P after full rotation:	15

REPORT
F08354-6001
ACCOUNT NUMBER
59000

A & L GREAT LAKES LABORATORIES, INC.

3505 Conestoga Drive • Fort Wayne, IN 46808 • Phone 260-483-4759 • Fax 260-483-5274
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QUALITY ANALYSES FOR INFORMED DECISIONS

REPORT PRINTED 12/24/2008

!46962000003!

TO: MIDWEST POULTRY SERVICE LP
2378 W 1300 N
N MANCHESTER, IN 46962-0000

FOR: HI GRADE LODA, ILL

ATTN: KEVIN BECHTOLD

LAB NUMBER: 44023
MANURE TYPE: POULTRY, SOLID W/O LITTER
SAMPLE ID: LODA 1-6

MANURE ANALYSIS REPORT

DATE SAMPLED: 12/18/2008
DATE RECEIVED: 12/19/2008
DATE REPORTED: 12/23/2008 PAGE: 2

PARAMETER	UNIT	ANALYSIS RESULT	TOTAL POUNDS PER TON	FIRST YEAR AVAILABILITY @ POUNDS PER TON
Moisture	%	59.18	1183.6	
Solids	%	40.82	816.4	
Nitrogen, Total (TKN)	%	1.579	31.6	22.5 *
Nitrogen, Ammonium (NH4-N)	%	0.457	9.1	9.1 *
Nitrogen, Organic (N)	%	1.122	22.4	13.4 *
Phosphorus (P)	%	0.686	31.4 (as P2O5)	31.4 (as P2O5) *
Potassium (K)	%	1.147	27.5 (as K2O)	27.5 (as K2O) *
Sulfur (S)	%	0.21	4.2	2.3 #
Magnesium (Mg)	%	0.25	5.1	2.8 #
Calcium (Ca)	%	4.67	93.5	51.4 #
Sodium (Na)	%	0.15	3.0	
Aluminum (Al)	ppm	119	0.2	
Copper (Cu)	ppm	38	0.1	<0.1 #
Iron (Fe)	ppm	344	0.7	0.4 #
Manganese (Mn)	ppm	178	0.4	0.2 #
Zinc (Zn)	ppm	209	0.4	0.3 #

A&L

@ Estimate of first-year availability does not account for incorporation losses. Consult MWPS-18, "Livestock Waste Facilities Handbook" for additional information.
* Source: MWPS-18, Livestock Waste Facilities Handbook, 1993
# Source: A3411, "Manure Nutrient Credit Worksheet", University of Wisconsin

REPORT
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QUALITY ANALYSES FOR INFORMED DECISIONS

REPORT PRINTED 12/24/2008

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TO: MIDWEST POULTRY SERVICE LP
2378 W 1300 N
N MANCHESTER, IN 46962-0000

FOR: HI GRADE LODA, ILL

ATTN: KEVIN BECHTOLD

LAB NUMBER: 44024
MANURE TYPE: POULTRY, SOLID W/O LITTER
SAMPLE ID: LODA 7-9

MANURE ANALYSIS REPORT

DATE SAMPLED: 12/18/2008
DATE RECEIVED: 12/19/2008
DATE REPORTED: 12/23/2008 PAGE: 3

PARAMETER	UNIT	ANALYSIS RESULT	TOTAL POUNDS PER TON	FIRST YEAR AVAILABILITY @ POUNDS PER TON
Moisture	%	56.09	1121.8	
Solids	%	43.91	878.2	
Nitrogen, Total (TKN)	%	1.687	33.7	26.0 *
Nitrogen, Ammonium (NH4-N)	%	0.708	14.2	14.2 *
Nitrogen, Organic (N)	%	0.979	19.6	11.8 *
Phosphorus (P)	%	0.804	36.8 (as P2O5)	36.8 (as P2O5) *
Potassium (K)	%	1.238	29.7 (as K2O)	29.7 (as K2O) *
Sulfur (S)	%	0.25	4.9	2.8 #
Magnesium (Mg)	%	0.33	6.7	3.6 #
Calcium (Ca)	%	7.09	141.7	78.0 #
Sodium (Na)	%	0.21	4.1	
Aluminum (Al)	ppm	168	0.3	
Copper (Cu)	ppm	67	0.1	0.1 #
Iron (Fe)	ppm	449	0.9	0.6 #
Manganese (Mn)	ppm	290	0.6	0.4 #
Zinc (Zn)	ppm	241	0.5	0.3 #

A&L

@ Estimate of first-year availability does not account for incorporation losses. Consult MWPS-18, "Livestock Waste Facilities Handbook" for additional information.
* Source: MWPS-18, Livestock Waste Facilities Handbook, 1993
# Source: A3411, "Manure Nutrient Credit Worksheet", University of Wisconsin

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TO: MIDWEST POULTRY SERVICE LP
2378 W 1300 N
N MANCHESTER, IN 46962-0000

FOR: HI GRADE LODA, ILL

ATTN: KEVIN BECHTOLD

LAB NUMBER: 44022
MANURE TYPE: POULTRY, SOLID W/O LITTER
SAMPLE ID: LODA 10

MANURE ANALYSIS REPORT

DATE SAMPLED: 12/18/2008
DATE RECEIVED: 12/19/2008
DATE REPORTED: 12/23/2008

PARAMETER	UNIT	ANALYSIS RESULT	TOTAL POUNDS PER TON	FIRST YEAR AVAILABILITY @ POUNDS PER TON
Moisture	%	29.23	584.6	
Solids	%	70.77	1415.4	
Nitrogen, Total (TKN)	%	3.465	69.3	44.2 *
Nitrogen, Ammonium (NH4-N)	%	0.323	6.5	6.5 *
Nitrogen, Organic (N)	%	3.142	62.8	37.7 *
Phosphorus (P)	%	0.955	43.8 (as P2O5)	43.8 (as P2O5) *
Potassium (K)	%	1.553	37.3 (as K2O)	37.3 (as K2O) *
Sulfur (S)	%	0.39	7.8	4.3 #
Magnesium (Mg)	%	0.41	8.2	4.5 #
Calcium (Ca)	%	6.83	136.6	75.1 #
Sodium (Na)	%	0.23	4.5	
Aluminum (Al)	ppm	218	0.4	
Copper (Cu)	ppm	41	0.1	0.1 #
Iron (Fe)	ppm	389	0.8	0.5 #
Manganese (Mn)	ppm	223	0.4	0.3 #
Zinc (Zn)	ppm	285	0.6	0.4 #

A&L

@ Estimate of first-year availability does not account for incorporation losses. Consult MWPS-18, "Livestock Waste Facilities Handbook" for additional information.
* Source: MWPS-18, Livestock Waste Facilities Handbook, 1993
# Source: A3411, "Manure Nutrient Credit Worksheet", University of Wisconsin

APPENDIX E

√ **NRCS STANDARD 633, APPENDIX A**
ILLINOIS PHOSPHORUS ASSESSMENT PROCEDURES

APPENDIX A

ILLINOIS PHOSPHORUS ASSESSMENT PROCEDURE

Use and Interpretation of the Illinois Phosphorus Assessment Procedure

Background:

Phosphorus (P) loading to surface water can accelerate eutrophicaction. The availability of other nutrients and light penetration into the water column will also influence the response of waterbodies to phosphorus. Land managers who desire to minimize transport of phosphorus need a practical assessment procedure to assist them in making decisions concerning the applications of phosphorus-containing materials.

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 to "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 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.

Solution Runoff Class Matrix

Hydrologic Soil Group			
A	B	C	D
Low	Medium	High	High

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

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.

Phosphorus Risk Potential	
Risk Factor	**Site value**
Soil Erosion	
Proximity to water	
Solution Runoff Potential	
Soil Test Phosphorus	
Phosphorus Inputs	

References:

- Sharpely, A.N., Determining An Environmentally Sound Soil Phosphorus Value, Journal Of Soil and Water Conservation, 1996.
- Sharpley, A.N., T. Daniel, T. Sims, J. Lemunyon, R. Stevens, and R. Parry. 1999. Agricultural Phosphorus and Eutrophication. U.S. Department of Agriculture, Agricultural Research Service, ARS-149, 42 pp.