NUTRIENT MANAGEMENT PLAN

General Information:

Owner's Address:
The Loda, Illinois facility is owned by:

Midwest Poultry Services, LP
PO Box 307
Mentone, Indiana 46539
Phone numbers: 800-551-1585, 219-353-7651, 219-269-2552
Fax number: 219-353-7223

Facility Address:
The mailing address for the facility is:

Hi-Grade Egg Producers, Loda Facility
360N US Route 45 North
Loda, Illinois 60948
Phone number: 217-386-2313
Fax number: 217-386-2686

Facility Manager:
Dave Garrelts is the manager of the facility, and can be reached at the above address and phone number.

Plan Prepared by:

Menke Consulting, Inc
6070 Routzong Road
Greenville, Ohio
Phone number: 937-447-4225
Fax number: 937-447-2225

Midwest Poultry Services, LP Hi-Grade Egg Producers, Loda Facility, to be referred to hereinafter as Hi-Grade, is a chicken laying hen egg production and egg processing operation located in Loda, Illinois in Iroquois County. 1,717,326 laying hens are currently housed under roof in ten barns generating ~20,770 as-is tons of manure annually. The manure generated is marketed/distributed off the farm to landowners/farmers/manure broker(s) who are in agreement with Hi-Grade to receive and land apply the manure utilizing best management practices. There are a little over 10,500 acres are available for manure application through landowners/farmers. However, manure that is distributed to a broker(s) can be applied to acres outside the list provided in Appendix C of this plan. The eggs that are produced at the farm are processed and packaged for shipping to retail markets for human consumption. Approximately 4,732 gallons of egg processing wastewater is generated per day, calculating to 1,727,130 gallons of wastewater generated annually. The egg processing wastewater is land applied to a 51-acre field owned by Hi-Grade located directly east of the wastewater lagoons (15 acres) and northeast of the poultry buildings (36 acres).

SECTION 1
Purpose and Conditions

Purpose of the Nutrient Management Plan The Nutrient Management Plan is a conservation system for your animal feeding operation. It is designed to address, at a minimum, site specific conservation practices that provide adequate erosion and runoff control to prevent discharge to waters of the state (appropriate buffers, setbacks, or equivalent practices); practices to ensure adequate storage of manure, litter, and process wastewater, including procedures to ensure proper operation and maintenance of the storage facilities; protocols for appropriate testing of manure, litter, process wastewater, and soil; the establishment of protocols for land application of manure, litter or process wastewater in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter or process wastewater; and the soil erosion and water quality concerns on your operation. Nutrient Management is managing the source, rate, form, timing, placement and utilization of manure, other organic by-products, bio-solids, and other nutrients in the soil and residues. The goal is to effectively and efficiently use the nutrient resources to adequately supply soils and plants to produce food, forage, fiber, and cover while minimizing the transport of nutrients to ground and surface water and environmental degradation.

Nitrogen and Phosphorus vs. Water Quality

Nitrogen and Phosphorus are two nutrients that have the potential to impair the quality of our groundwater and surface water. Nitrogen leaching out the root zone may enter a tile and be transported to surface water or it may leach to the groundwater. The EPA Drinking Water Maximum Contaminant Level (MCL) for Nitrate-nitrogen is 10 mg/L. Phosphorus leachate, or runoff entering the surface water may contribute to excessive algae growth, which may cause low oxygen levels in surface water. This in turn may impair aquatic life. This nutrient management plan will help to protect the groundwater and surface water.

SECTION 2
Wastewater Management Plan

WASTEWATER APPLICATION SITES

All wastewater will be land applied for crop utilization of the nutrients and as a water resource. Based on average analysis from the current egg processing lagoon system in operation at Hi-Grade, it is evident that the 1st limiting factor for land application of the wastewater will be soil infiltration rate. One primary irrigation field will be utilized, with a center pivot irrigation system installed to apply a portion of the wastewater. The fields for wastewater irrigation include a 15-acre field directly east of the wastewater lagoon system and a 36-acre field directly east of the poultry buildings. There are a total of approximately 51 acres available which have excellent isolation from prevailing wind direction residences. These fields are comprised mainly of Clarence silty clay loam soil with 2-6% slopes, and Rowe silty clay loam soil with 0-2% slopes. Maps of soil types and soil type information can be found in Appendix A of this plan.

WASTEWATER APPLICATION

At the current wastewater generation rate, an approximate total of 1,727,130 gallons of wastewater is generated annually, plus an additional annual net rainfall of ~282,592 gallons between both lagoons, which calculates to 2,009,722 total gallons of wastewater to be stored annually by the lagoon storage system. Based on average analysis of wastewater from Hi-Grade's wastewater lagoon system, nutrient management calculations have been performed, and are included in Appendix B, along with the analytical results.

This wastewater is appropriate for irrigation on growing crops (will not cause a burn or leave a solids residue), will not result in an offensive odor, and will not attract nor provide a breeding medium for pests. Based on those factors, various crop rotations can be planned to maximize the utilization of the water resource during those times of the year when evapo-transpiration is the highest (summer months), and crop needs for moisture are at highest demands. When soils are suitably dry during the early spring and late fall months, wastewater applications are also appropriate if managed carefully. The establishment of a perennial crop of grass that will be harvested for hay is suggested to maximize soil infiltration and windows of application opportunities, thus minimizing run-off potential. Other typical row crops, such as corn and soybeans are also acceptable.

I. LAND APPLICATION GUIDELINES: (The following guidelines WILL be followed for land application of wastewater)

1. All wastewater will be applied through a portable travelling gun irrigation system, pull type liquid tank spreader, mounted liquid tank spreader, or a center pivot irrigation system. The 36-acre field is the primary irrigation field where the center pivot system is installed. Due to the configuration and effective watering area of center pivot systems, it is estimated that approximately 15 acres will have wastewater applied through the center pivot. The other portions of the field not covered under center pivot will be applied to via the other above mentioned methods of application. Irrigation systems are preferred for use on growing crops in order to limit soil compaction of the field and to limit wastewater applications to low rates applied on a frequent basis.

2. All irrigation equipment, pumps, piping and any associated wastewater handling or application devices will be maintained in good working order and be operated as effectively as possible and in compliance with best management practices. See Appendix H for a Land Application Equipment record form.

3. Application rates should not exceed the infiltration capacity of the soils comprising the irrigation fields. **It is recommended that no more than 0.5"/day (13,600 gallons/acre/day) be applied to minimize run-off potential.** See Section 7 Nutrient Application Rate Planning Worksheet and Section 8 Nutrient Application Equipment Calibration to determine proper application rates. Also see Section 9 for an Available Water Capacity (AWC) table to determine volume applications not to exceed AWC.

4. A rain gauge will be installed at the irrigation field in a location that will not be disturbed by cropping activities and where irrigated wastewater will not influence the collected amount. The rain

gauge will be used to confirm application rates, and adjustments will be made as necessary per irrigation system manufacturer's recommendations. Records of rainfall will be maintained along with wastewater irrigation records.

5. Total cumulative maximum annual applications should never exceed the nitrogen needs of the subsequent crop as calculated from the available nitrogen content of the wastewater as determined through actual analyses, or the soil infiltration capacity, which ever is less. The cumulative maximum rates must also take into consideration any other applied crop nutrients from sources other than the wastewater, such as manure, compost or chemical fertilizers.

6. There are several appropriate crops that can be planted to utilize the egg processing wastewater nutrients. Guidelines to maximize Nitrogen and Phosphorus utilization and minimize losses will be followed per NRCS Standard 590, Appendix B, which is included in Appendix F of this plan.

7. Wastewater may not be applied in waterways, unless the following criteria are observed. A grass area serving as a waterway may receive wastewater through an irrigation system if:

a. There is no runoff
b. The distance from applied wastewater to surface water is greater than 200 feet
c. The distance from applied wastewater to potable water supply wells is greater than 150 feet.
d. The distance from applied wastewater to a non-potable well, an abandoned or plugged well, a drainage well, or an injection well is greater than 100 feet
e. Precipitation is not expected within 24 hours

8. Wastewater will not be land applied on frozen or snow-covered cropland unless prior approval is obtained from the Illinois EPA in emergency situations and a contigency plan is developed and approved by the Illinois EPA.

9. Application setbacks will be 35 ft. from grass waterways, ditches, and tile inlets; 200' from streams, ponds or lakes; and 150 ft. from potable wells and residences.

10. Field tile outlets shall be monitored prior to, during, and after land application to ensure no wastewater is leaving the site via subsurface drainage. Tile plugs shall be available for use if the need arises. Inspect tile lines for blowouts, backups, etc and repair broken tile prior to wastewater application.

11. Wastewater will not be applied when there are cracks in the field exceeding a depth of 8 inches unless a tillage operation is performed prior to application to seal such cracks.

12. Using the attached soil moisture practical interpretation table (Section 9), soils will be evaluated prior to wastewater applications, and wastewater rates will not exceed those rates indicated as appropriate according to the available moisture capacity of the field.

II. MONITORING

WASTEWATER ANALYSES

An annual representative **wastewater sample** shall be collected from each wastewater lagoon. Grab samples are to be collected at such times and locations, and in such fashion, as to be representative of the facilities' performance. Sampling will occurr prior to application periods in order to be reflective of the wastewater to be land applied. The samples will be analyzed for the following parameters:

- Total Solids (mg/l)
- Ammonia Nitrogen (mg/l)
- Nitrite (mg/l)
- Nitrate (mg/l)
- Total Nitrogen (mg/l)
- Phosphorus, Total P (mg/l)
- Potassium, Total K (mg/l)
- Sodium, Total Na (mg/l)
- Calcium, Total Ca (mg/l)

- Magnesium, Total Mg (mg/l)

SOILS ANALYSES

Representative **soil samples** for each application site used will be collected at least once every 3 years using standard soil sampling methods and techniques and sent to a laboratory performing standardized acceptable soil testing methods and procedures for analysis. Soil tests should include, at a minimum:

- total exchange capacity
- % organic matter
- available phosphorus (as ppm P and/or lb/a P_2O_5)
- exchangeable potassium (as ppm K and/or lb/a K_2O)
- exchangeable calcium (ppm and lb/a)
- exchangeable magnesium (ppm and lb/a)
- exchangeable sodium (ppm and lb/a)
- residual available soil nitrogen
- Soil pH
- Buffer pH

Wastewater application rate adjustments should be made based on the analyses of the wastewater. Soil samples for the fields where wastewater is applied to shall be collected at a time of the year when the information from the results can be used to maximize the utilization of the wastewater nutrients.

SAMPLING PROCEDURES

All sampling methods, preservation of samples, holding times and laboratory analyses for wastewaters shall conform to regulation 40 CFR 136, "Test Procedures for the Analysis of Pollutants". All soil testing shall be performed by laboratories in conformance with the North Central Region 13 (NCR 13) method of testing. See Sections 5 & 6 for more detailed instructions for sampling procedures.

MONITORING, REPORTING & RECORD KEEPING

Monitoring, reporting, and inspection record keeping forms are included in Appendix H. These represent the type of form and content of information to be recorded and document for all livestock and livestock waste facilities, and application activates. Records shall be kept at the facility for a minimum of five years. See Section 11 for more detailed information on monitoring, reporting and record keeping.

SECTION 3
Manure Management Plan

MANURE APPLICATION SITES

All manure will be land applied for crop utilization of the nutrients, soil fertility management, and soil health and tilth enhancement. The two most limiting factors for land application of the manure will be nitrogen and phosphorus application. Hi-Grade has access to over 10,500 acres of cropland for land application through **Manure Land Application Agreements** between farm operators and Hi-Grade. These land application agreements were submitted along with Hi-Grade's Livestock Waste Management Plan that was approved by the Illinois Department of Agriculture in 1999. (See Appendix C for a list of available acres based from the land application agreements). With the vast number of acres available for land application, the limiting factor for land application will be dependent on the soil phosphorus level (Bray PI or Mehlich III) of each application site.

All manure is sold or gifted to neighboring farmers. Hi-Grade does not apply or manage any manure on land controlled, owned or managed by the facility. Hi-Grade removes the manure from the storage facilities and transports the manure to others via manure spreaders or semi-trailers, depending on distance of application site from facility. Currently, for a contractual period of two years, all manure from the facility is sold to a manure broker who then in turn sells the manure to various farmers. Many of the farmers the broker sells to have manure land application agreements with Hi-Grade. Hi-Grade loads the manure broker's semi-trailers and the broker transports and distributes the manure to his customers.

MANURE APPLICATION

At the current laying hen numbers, approximate manure generation (based on operating records average from past four years) is at 20,770 as-is tons of manure annually. The manure is an excellent source of nutrients that can be utilized for crop production, soil fertility, and soil health and tilth and they include, but not limited to: nitrogen, phosphorus, potassium, calcium, trace elements and organic matter. All manure generated is exported off the farm and distributed/marketed to neighboring farm operators. When the manure is sold, Hi-Grade shall provide all manure recipients with a copy of the most recent laboratory manure analysis, representative of the manure received, and shall inform the buyer that they must handle and land apply the manure according to a Nutrient Management Plan for their farm utilizing poultry manure as a complement to their chemical fertilizer program. The buyer and seller (Hi-Grade) will signify their mutual understanding of the management responsibilities incurred by signing a Manure Distribution Agreement for the manure. An example Manure Distribution Agreement is included in Appendix H.

There is approximately 323,648 pounds of plant available nitrogen being generated annually by the layer manure. It is estimated that the little over 10,500 acres available for manure application will utilize well over 1.57 million pounds of available nitrogen each crop year. After taking into consideration assumptions of the residual nitrogen from previous manure applications and previous legume crops, the crops grown on these acres annually will require over 1.20 million pounds of available nitrogen. 323,648 pounds of plant available nitrogen / 1.20 million pounds of utilized nitrogen by the crops = 27.77% utilization rate. Therefore, there are an adequate number of acres available for manure application. (See Appendix D for a manure nutrient budget summary). Nitrogen application rates from the manure and from supplemental fertilizers are determined by the farmers who receive the manure and control all farm cropping aspects of the land receiving manure.

There is approximately 766,241 pounds of Phosphate (P2O5) being generated annually by the layer manure. The little over 10,500 acres available for manure application will utilize approximately 479,900 pounds of phosphate each year. 766,241 pounds of phosphate / 479,900 pounds of utilized phosphate by the crops = 160% utilization rate. The utilization rate is only calculated for the phosphorus removal of only the following year's crop, not multi-year phosphorus crop removal. Therefore, it will be necessary for the recipients of the manure to review each site for soil phosphorus levels prior to land application and take into consideration multi-year phosphorus applications, soil test levels and build-up

levels of phosphorus desired and/or necessary for optimum agronomic returns. (See Appendix D for a manure nutrient budget summary).

Based on average analysis of the manure from Hi-Grade, nutrient management calculations and a manure nitrient budget summary have been performed, and are included in Appendix D, along with copies of the analytical results.

I. LAND APPLICATION GUIDELINES: (The following guidelines WILL be supplied to each manure recipient as BMP's for land application of layer manure)

1. All manure shall be applied at times when the manure can be incorporated within 24 to 72 hours of application. The tillage practice used for incorporation should be a part of a planned system that adequately controls soil erosion, controls odor, and minimizes nutrient loss.

2. When tillage can be performed, surface applications of manure that is subject to volatilization on the soil surface shall be incorporated into the soil within 24 hours after application. {NRCS Practice Standard 590}

3. To minimize emissions and to reduce odors the following methods shall be utilized during application periods and they include, but are not limited to, incorporation of surface applications of solid forms of manure into the soil within 24 hours, consideration of wind direction and velocity, humidity, day of week, and distance to neighboring residences and populated areas. {NRCS Practice Standard 633}

4. All land application equipment and equipment used for manure transport will be maintained in good working order and be operated as effectively as possible and in compliance with best management practices. See Appendix H for a Land Application Equipment Record form.

5. Application rates should not exceed crop nutrient requirements for available nitrogen and/or phosphorus. Manure shall not be surface applied at rates providing more than 75 lbs/acre of available P2O5, unless incorporated within 72 hours. Manure may be applied based on nitrogen removed by harvested crops, until Bray PI or Mehlich III levels exceed 300 lbs P per acre (150 ppm P). For fields with P levels exceeding 300 lbs P per acre, manure shall only be applied based on phoshporus removal of the subsequent years harvested crops or other application sites with lower soil P levels should be used. Manure may be applied at rates not to exceed the agronomic phosphorus demand for crops grown in multiple years. If manure is applied as a multi-year phosphorus application, additional phosphorus shall not be subsequently land applied to that land until either the applied phosphorus amount has been removed from that land via harvest or crop removal, or phosphorus is needed to meet the agronomic phosphorus demand fro the next crop grown. If multi-year phosphorus applications are utilized, the application rate shall not exceed the next year's crop nutrient requirement for available nitrogen. See Section 9 Nutrient Application Rate Planning Worksheet and Section 11 Nutrient Application Equipment Calibration to determine proper application rates and nutrient loadings.

6. Manure shall not be applied to frozen or snow covered soil over 5% slopes unless provisions are made to control runoff and pollution. Such provisions include terraces, contour buffer strips, contour stripcropping, grass or grass-legume cover, heavy residue cover or contour chisel plow.

7. There are several appropriate crops that can be planted to utilize the manure nutrients. Guidelines to maximize Nitrogen and Phosphorus utilization and minimize losses will be followed per NRCS Standard 590, Appendix B, which is included in Appendix F of this plan.

8. Application to cropland requires that cropland meet soil loss tolerances. Manure shall not be applied to cropland with slopes greater than 15%. However, manure can be surface applied to pastureland, hayland, or meadow crops without incorporation or injection on slopes up to 20% if the land meets soil loss tolerances and applications are made when runoff is unlikely.

9. Field tile outlets shall be monitored prior to, during, and after land application to ensure no manure is leaving the site via subsurface drainage. Tile plugs shall be available for use if the need arises. Inspect tile lines for blowouts, backups, etc and repair broken tile prior to manure application.

10. Manure shall not be applied to frequently flooded soils during periods when flooding is normally expected. Manure shall not be applied to soils where ponding of water exists. Manure shall not be applied to soils that have been saturated within the 24-hour period prior to the time of application.

Manure shall not be applied during precipitation when the land is saturated or precipitation will produce runoff of the manure.

11. The following are land application setback requirements:
    a. Livestock waste should not be applied within 200 feet of surface water unless the water is upgrade or there is adequate diking. There should be a vegetative strip between the application area and any surface water. Waste should not be applied within 150 feet of any water well. {IEPA Section 560.203}
    b. Livestock waste should not be applied in a 10 year flood plain unless the injection or incorporation method of application is used. {IEPA Section 560.204}
    c. Livestock waste should not be applied in waterways. {IEPA Section 560.205}
    d. Waste application on frozen or snow-covered land should be avoided. If wastes are spread on frozen or snow-covered land, such application should be limited to land areas on which: a) Land slopes are 5 percent or less, or b) Adequate erosion control practices exist. {IEPA Section 560.206}
    e. Livestock waste shall not be applied within 100 feet of downgradient 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. {Illinois NPDES General Permit SC 5c.vi.}

II. MONITORING

MANURE ANALYSES

Representative **manure samples** shall be collected annually from the facility. A represemtative sample shall be collected for the two storage barns that store the manure form layer barns 1 through 6 ,a representative sample shall be collected for the three layer barns 7 through 9 with deep pit storage, and for layer barn 10 with the separate manure storage area. The samples will be analyzed for the following parameters:

- Total Kjeldahl Nitrogen (mg/kg, dry weight basis and/or mg/l, wet weight basis)
- Ammonia Nitrogen (mg/kg, dry weight basis and/or mg/l, wet weight basis)
- Nitrate Nitrogen (mg/kg, dry weight basis and/or mg/l, wet weight basis)
- Total Phosphorus (mg/kg, dry weight basis and/or mg/l, wet weight basis)
- Percent Solids (mg/kg, dry weight basis and/or mg/l, wet weight basis)

Based on average analysis of manure from Hi-Grade, sample nutrient management calculations have been performed, and are included in Appendix D, along with copies of the manure analytical results

SOILS ANALYSES

It is recommended to the manure recipient that representative **soil samples** for each application site used be collected at least once every 3 years using standard soil sampling methods and techniques and sent to a laboratory performing standardized acceptable soil testing methods and procedures for analysis. Soil tests should include, at a minimum:

- total exchange capacity
- % organic matter
- available phosphorus (as ppm P and/or lb/a P_2O_5)
- exchangeable potassium (as ppm K and/or lb/a K_2O)
- exchangeable calcium (ppm and lb/a)
- exchangeable magnesium (ppm and lb/a)
- exchangeable sodium (ppm and lb/a)
- residual available soil nitrogen
- Soil pH
- Buffer pH

Manure application rate adjustments should be made based on the analyses of the manure. Soil samples for the apllication sites to be used shall be collected at a time of the year when the information from the results can be used to maximize the utilization of the manure nutrients.

SAMPLING PROCEDURES

All sampling methods, preservation of samples, holding times and laboratory analyses for manure shall conform to regulation 40 CFR 136, "Test Procedures for the Analysis of Pollutants". All soil testing shall be performed by laboratories in conformance with the North Central Region 13 (NCR 13) method of testing. See Sections 5 & 6 for more detailed instructions for sampling procedures.

MONITORING, REPORTING & RECORD KEEPING

Monitoring, reporting, and inspection record keeping forms are included in Appendix H. These represent the type of form and content of information to be recorded and document for all livestock and livestock waste facilities, and application activities. Records of manure distribution shall be kept at the facility for a minimum of five years. See Section 11 for more detailed information on monitoring, reporting and record keeping. All other records are at the discretion of the recipient.