

**EFiled: Jun 13 2018 09:06AM EDT**  
**Transaction ID 62132474**  
**Case No. S18C-06-009 ESB**

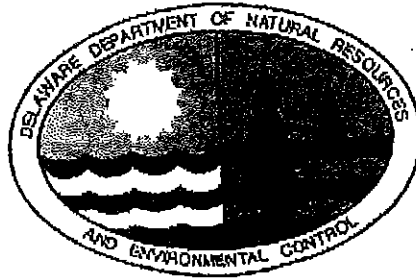


EXHIBIT G

**Spray Irrigation Operations Permit**

Issued by: Groundwater Discharges Section  
Division of Water  
Department of Natural Resources  
and Environmental Control  
89 Kings Highway  
Dover Delaware 19901  
302-739-9948

DEN Number: 359191-04  
Effective Date: July 31, 2017  
Expiration Date: July 30, 2022

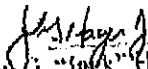


**AUTHORIZATION TO OPERATE AND MAINTAIN  
UNDER THE LAWS OF THE  
STATE OF DELAWARE**

**PERMITTEE:** Mountaire Farms of Delaware, Inc.  
P.O. Box 1320  
Millisboro, Delaware 19966

**FACILITY:** Mountaire Farms of Delaware, Inc.

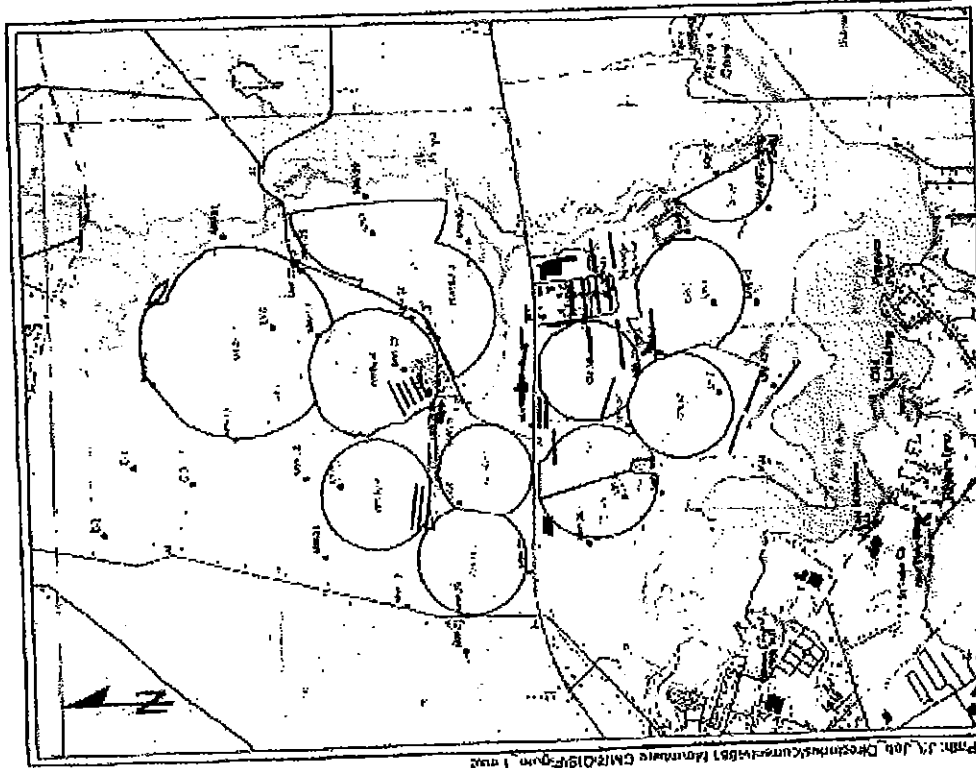
1. Pursuant to the provisions of 7 Del. C. §6003, Mountaire Farms of Delaware, Inc. is herein authorized to operate and maintain the facility known as Mountaire Farms of Delaware, Inc. located on Route #24, approximately 2.0 miles east of Millisboro, Sussex County, Delaware to spray irrigate treated poultry processing wastewater and treated sanitary waste to an area north of State Route #24 "WHBJ" consisting of 619 acres and to areas south of State Route #24 "Center Block System" consisting of 343 acres.
2. The effluent limitations, monitoring requirements and other permit conditions are set forth herein.

  
John G. "Jack" Hayes, Jr.  
Environmental Program Manager  
Groundwater Discharges Section  
Division of Water  
Delaware Department of Natural Resources  
and Environmental Control

7/31/17...  
Date Signed

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SAFE MAP - Leading of insects reproduced by the D-1025



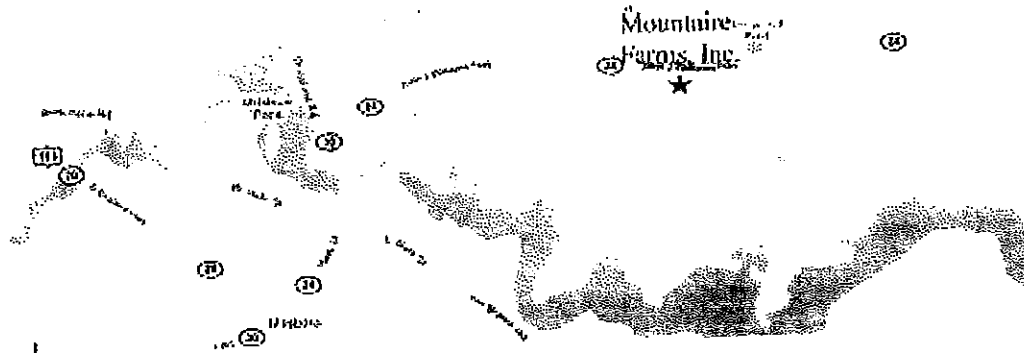
Note: Chukchee houses shown in study area were destroyed from 1954 and 1952 USGS 7.5 minute quadrangles for Malabar, Doolittle. All crooked houses shown have been abandoned.

	Insects Houses Abandoned Houses	
	0 1,000 2,000 3,000 4,000 Feet	

Figure 1: USGS 7.5 minute quadrangle map for Malabar, Doolittle showing the location and topography of the site and vector study areas (created 1956, Photorevised 1982)

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LOCATION MAP





**PART I**

**A. GENERAL DESCRIPTION OF OPERATION/DISCHARGES**

The treatment facility is designed to treat poultry processing wastewater and sanitary waste. The treatment process includes: primary and secondary screening, dissolved air flotation (DAF), anaerobic lagoon biological treatment/equalization (2 lagoons), activated sludge biological treatment with biological nutrient reduction capability – Modified Ludzack-Eitingor (MLE), secondary clarification (2 units), sludge digestion and thickening, disinfection (chlorination) and a post treatment spray irrigation storage lagoon.

The treated effluent is spray irrigated onto approximately 928 acres. Seven center pivot spray irrigation systems are located north of State Route #24 and are designated as W1BJ Systems Nos. 1, 2, 3, 4, 5, 6, 7. And, six center pivot spray irrigation systems are located south of Route #24 and are designated as Center Block Systems Nos. 3, 3A, 3B, 3C, 3DE and 3DW.

The fields are maintained in corn, small grains (barley and wheat), and soybeans.

Approximately 542 acres are permitted for wet and cold weather use.

Spray Field Listing per 2017 Vegetative Management Plan (Update Attachment D):

**Spray Field Listing**

Spray Field	Irrigated Acres	Legal Acres by Farming Group	Tilled Acres by Farming Group	% Irrigated Allowed	Wet Weather Approved	Wet Weather Acres	2.5' Buck (gals)
CenterBlock 3 *	75.33	164.30	139.81	76.4%	Yes*	69.62	5,109,794
CenterBlock 3A	28.57						1,971,295
CenterBlock 3B	64.24	139.62	202.80	84.4%	Yes	64.24	4,353,699
CenterBlock 3C	64.27				Yes	64.27	4,549,725
CenterBlock 3D Field	41.53				Yes	41.53	2,816,521
CenterBlock 3D West	41.87	41.97	40.09	87.4%	Yes	39.20	2,824,487
W1BJ 1	54.39	119.62	159.81	79.7%	Yes	54.39	3,679,769
W1BJ 2	55.27				Yes	55.27	4,427,576
W1BJ 3 *	70.60	78.00	76.88	77.2%	Yes*	59.60	5,204,744
W1BJ 4 *	75.84	78.84	101.68	78.1%	Yes*	74.69	5,207,632
W1BJ 5	84.42	137.33	168.69	83.9%	-	-	4,944,493
W1BJ 6	12.21				-	-	8,361,200
W1BJ 7	156.54	193.14	231.09	86.4%	-	-	11,523,403
	<b>928.12</b>	<b>928.12</b>	<b>1131.09</b>	<b>81.6%</b>		<b>642.01</b>	<b>62,000,911</b>

\*Portions of fields not allowed during wet/cold weather. Area reduction estimated.

## B. DOCUMENTATION

The slow rate land treatment operation shall be conducted in accordance with the following documents:

1. The State of Delaware, Department of Natural Resources and Environmental Control's Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems (Regulations).
2. The Operations and Management Plan submitted by Townsends Inc., during 1988.
3. The letter to Ronald F. Cimcher from Metcalf and Eddy dated July 26, 1989 addressing the plan of action for the effluent disinfection system.
4. The letter to Gordon Serman from Bruce B. Bagley dated August 15, 1995 asking Townsends Inc. to address several outstanding issues.
5. The letter to Bruce B. Bagley from Robert A. Palezewski dated October 13, 1995 addressing the decreased buffer zone distance and monitoring plan.
6. A letter to Joseph Mulromney from Bruce Stephens dated August 5, 1997 identifying wet weather irrigation fields at the Townsends treatment facility.
7. A Detail Soil Investigation for Cordrey and Frame Farms dated February 1999 submitted by Bradley Cates.
8. A report submitted by Bruce Stephens from James E. Havey dated March 23, 1999 addressing the treatment capacity of the Townsend's wastewater treatment capability and future wastewater treatment needs.
9. Plans and Specifications dated June 2, 1999 submitted by Metcalf and Eddy detailing treatment plant upgrades to increase future treatment capacities.
10. A report submitted by Gordon Serman to Doris Hamilton on August 24, 1999 identifying the wet weather spray irrigation fields.
11. A letter dated April 7, 2000 from George C. White notifying DNR/RC of the sale of the Townsend Facility to Mountaire Corporation.
12. A letter to Bruce B. Bagley from Jeff Smith dated November 8, 2002 providing detailed calculations on the Stormwater Improvement Project and site plan of the facility.
13. A Vegetative Management Plan for Spray Irrigation of Treated Wastewater prepared by George, Miles and Buhr, L.L.C. dated January 31, 2003.
14. A Spray Irrigation Permit Application submitted by Mountaire Farms, Inc. on October 23, 2008.
15. The Design Development Report Addendum 2011 Wastewater Treatment Improvements submitted by CABE Associates, Inc. dated December 7, 2010.
16. Any other correspondence, documentation and/or reports related to the Mountaire Farms of Delaware, Inc. Wastewater Treatment Facility received and approved by the Groundwater Discharges Section and/or sent by the Groundwater Discharges Section.

### C. INFLUENT LIMITATIONS

1. The monthly average influent to the wastewater treatment facility shall not exceed 2.6 million gallons per day in any calendar month calculated as Total Monthly Volume divided by the number of days in the month.

The connection of additional units or waste streams other than those indicated in the approved design documents referenced in Part I.B is prohibited without prior written approval from the Groundwater Discharges Section.

Design Treatment Capacity: 2.6 MGD Monthly Average [calculated as Total Monthly Volume divided by the number of days in the month]

### D. SPRAYED EFFLUENT LIMITATIONS

During the period beginning on the effective date and lasting through the expiration date of this permit, the Permittee is authorized to discharge to the spray irrigation field(s) identified on page 1, in Part I.A, and depicted on page 2 of this permit the quantity and quality of effluent specified below and in accordance with the design documents listed in Part I.B of this permit:

1. The monthly average quantity of effluent discharged from the wastewater treatment facility to the spray fields shall not exceed 2.6 million gallons per day (MGD) calculated as Total Monthly Volume divided by the number of days in the month.
2. The average weekly quantity of effluent discharged to any portion of the spray irrigation field shall not exceed 2.5 inch per acre averaged over a 7 day rolling period.
3. The quantity of effluent discharged to any portion of the spray irrigation field shall not exceed 0.25 inch/acre/hour.
4. There shall be a minimum of a three hour rest period between applications of wastewater to the spray fields when the center pivot systems (WRIBJ 4, 5, 6, Center Block 3A, 3D east and west) contact any permanent end stop. On all other spray fields, there shall be a sufficient rest period between applications to prevent field saturation and runoff from occurring in any part of the field.
5. The pH of the effluent shall not be less than 5.5 standard units nor greater than 9.0 standard units at any time.
6. The total residual chlorine concentration shall not be less than 1.0 mg/l, nor more than 4.0 mg/l, at any time.
7. The Chloride concentration of the effluent shall not exceed 250 mg/l, on an average annual basis.
8. Design Effluent Nitrogen Concentration:

The facility has been designed for a monthly effluent Total Nitrogen concentration of 15.6 mg/l.<sup>1</sup>

If the effluent exceeds a Total Nitrogen concentration of 19.5 mg/l, [Design Value + 25%] in any calendar month, the permittee shall resample the wastewater and submit the additional analyses to the Groundwater Discharges Section. If the effluent exceeds 19.5 for over a three month period, the permittee must have the system evaluated to determine the cause and submit a revised Design Engineer Report to the Groundwater Discharges Section. If the effluent exceeds 29.7 [Design Value + 50%], the Department may invoke the provisions of Part V.A.1 of this permit. [Also reference Part II.B.1.]

<sup>1</sup> Design Effluent Nitrogen Concentration is in accordance with Page 2 and Attachment B Page 1 and 2 of the Design Development Report Addendum 2011 Wastewater Treatment Improvements submitted by CABI Associates, Inc. dated December 7, 2010.



9. The total amount of nitrogen that may be applied to each spray field acre shall not exceed the following amounts. These amounts include supplemental fertilizers, the nitrogen supplied from the effluent, and any other source.

Spray Field Crop Type	Nitrogen Loading Limit <sup>2</sup>
Corn and Small Grain	320 lbs/acre
Soybeans and Small Grain	120 lbs/acre

Adjustments and reductions for denitrification, ammonia volatilization, evapotranspiration and plant uptake are not to be factored into the annual reporting of Total Nitrogen Loading for demonstration of compliance with this limit.

If any crops are not removed from the spray irrigation fields, then the total nitrogen application rate for the field must be reduced by the amount of nitrogen that would be removed by harvesting the crop as detailed in the facility's Design Engineer Report.

The limitation of total nitrogen that can be applied to each acre may be adjusted by the Groundwater Discharges Section if it can be shown through subsequent analysis of the crop removed that the total nitrogen removed with the crop is equal to the amount applied from the effluent and additional fertilizer applications. Supplemental additions of commercial fertilizers shall be limited to amounts necessary to meet crop needs in accordance with the written recommendations of the University of Delaware Cooperative Extension Service, or a Delaware Certified Crop Advisor, for the specified crop and anticipated yield.

10. The discharge to the spray irrigation fields shall be free from material such as floating solids, sludge deposits, debris, sump, oil and grease.
11. The facility has been designed for limited public access. The treated wastewater utilized for limited public access sites must meet the following daily permissible average concentrations. The daily average concentration shall be determined by the summation of all the measured daily concentrations obtained from composite samples divided by the number of days during the calendar month when the measurements were made.
- The 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>) of the treated wastewater must not exceed 50 mg/L.
  - Disinfection of wastewaters containing domestic waste is required to yield a discharge not to exceed 200 col/100 ml Fecal Coliform.
  - The treated wastewater must not contain more than 50 mg/L of Total Suspended Solids.

Parameter	Daily Permissible Average Concentration
BOD <sub>5</sub>	50.0 mg/L
Fecal Coliform	200 colonies/100 ml
Total Suspended Solids	50 mg/L

#### E. FACILITY CLASSIFICATION

1. A classification was performed on the permitted facility in accordance with Regulations Licensing Operators of Wastewater Facilities. The wastewater treatment system is designated as a Class IV Facility. The facility must be under the direction of a Class IV Licensed Operator in Direct Responsible Charge for the facility who is available at all times. A licensed operator, operating under the direction of the licensed operator in Direct Responsible Charge for the facility, must be available when the spray irrigation system is in operation.

<sup>2</sup> Nitrogen Loading Limit in accordance with Attachment B, Page 3 of the Design Development Report Addendum 2011 Wastewater Treatment Improvements submitted by CABB Associates, Inc. dated December 7, 2010.

#### F. SCHEDULE OF COMPLIANCE

1. The Permittee shall submit the information necessary and/or complete the following requirements for proper compliant operation of the spray irrigation system:
  - a. Effluent Total Nitrogen concentration:
    - i. By October 31, 2017, the Permittee must return Mountain Farms of Delaware, Inc.'s effluent Total Nitrogen concentration to within 25% of the design value of 15.6 mg/l, in accordance with the Design Development Report Addendum 2011 Wastewater Treatment Improvements submitted by CABE Associates, Inc. dated December 7, 2010.
    - ii. By August 31, 2017, the Permittee must submit to the Groundwater Discharges Section a Plan of Corrective Action. The Plan must include proposed efforts to investigate the cause of the elevated Total Nitrogen concentration in the effluent, proposed modifications to the system, and a timeline for implementing proposed modifications.
2. The Permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance by specified date. In the event of noncompliance, the notice shall include the cause of noncompliance, any remedial action taken, and the probability of meeting the next scheduled requirement.

#### G. BUFFER REQUIREMENTS

Buffer zones must be maintained in accordance with Section 6.3.2.J.10 of the Regulations unless otherwise specified below.

1. A buffer zone of at least 50 feet shall be maintained between the edge of the wetted field area and all highways, individual lots and property lines.
2. A buffer zone of 50 feet shall be maintained between the wetted edge of the spray field and the edge of any wetlands or any perennial lake or stream provided that the buffer zone is maintained in perennial vegetation, otherwise a buffer zone of 100 feet shall be maintained.
3. Spray irrigation of wastewater in the reduced buffer areas along Route #24 and County Road 300 shall only occur during daylight hours.

#### II. SLUDGE HANDLING REQUIREMENTS

In accordance with AGH 1402-5-03 and AGH 1403-5-03 issued by DNREC's Surface Water Discharges Section (302) 739-9946.

#### I. FACILITY SPECIFIC CONDITIONS

1. Spray irrigation is prohibited when saturated or frozen soil conditions exist, except on fields identified by the Department as "wet weather irrigation fields." No runoff of wastewater from the spray fields may enter adjacent properties, tax ditches or other water bodies. Pivot #'s CBS# 3, 3B, 3C, 3D east, 3D west (except for a portion of CBS# 3 which is adjacent to Indian River) and WHBJ 1, 2, 3 and 4 (except for portions of the WHBJ 3 and 4 spray areas along the ditch that runs west to east along these systems) have been designated as "wet weather irrigation fields."
2. If down-gradient water supply wells (public or private) are contaminated by the wastewater spray irrigation process, the permittee shall provide a free, alternative potable water supply to the affected parties.
3. The permittee shall track the wind direction to ensure that no spray drift occurs to roadways during irrigation. If wind conditions are such that spray drift could occur over roadways, then all spray irrigation activities shall cease in these fields.

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Effective Date: July 11, 2017  
Expiration Date: July 10, 2022  
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4. The irrigation pump station shall be kept free from accumulated solids, debris or sludge deposits.
5. Use of the spray irrigation system for the application of pesticide products shall be conducted in accordance with approved standards for sprinkler chemigation.
6. Commercial phosphorus fertilizer applications should be limited to starter fertilizer for corn if soils tests show that it is necessary (per Jan 2015 CMR - Soils Recommendations page 9).

**PART II**

**A. MONITORING REQUIREMENTS**

During the period beginning on the effective date and lasting through the expiration date of this permit, the Permittee is authorized to discharge to spray irrigation fields identified on page 1, in Part I.A, and depleted on page 3 of this permit. Such discharge shall be monitored by the Permittee as specified herein.

Requests for monitoring modifications must be submitted to the Department's Groundwater Discharges Section in writing. Such requests must clearly state the reason for and nature of the proposed modification and, where applicable, must contain supporting scientific information, analysis, and justification. Requests will be addressed by the Department on a case by case basis.

Permittee shall initiate periodic reporting required under Part II.B.2 upon initiation of irrigation activities for all of the following monitoring requirements.

**1. INFLUENT MONITORING REQUIREMENTS**

Permittee shall sample combined flows resulting into the following two influent streams:

- a. From anaerobic lagoon #1 going to the oxidation ditch; and
- b. From anaerobic lagoon #2 going to the MLE.

Permittee shall submit spreadsheet summarizing combined flows resulting in the two influent streams with the Monthly DMR.

Parameter	Unit of Measurement	Monitoring Frequency	Sample Type
Flow	Gallons/Day	Continuous	Recorded
BOD <sub>5</sub>	mg/L	Monthly	Grab
TSS	mg/L	Monthly	Grab
Total Nitrogen	mg/L	Monthly	Grab
Ammonia Nitrogen	mg/L	Monthly	Grab
Nitrate/Nitrite as Nitrogen	mg/L	Monthly	Grab
pH	S.U.	Monthly	Grab
Total Phosphorus	mg/L	Monthly	Grab
Chloride	mg/L	Monthly	Grab

## 2. SPRAYED EFFLUENT MONITORING REQUIREMENTS

Samples taken in compliance with the monitoring requirements for Fecal Coliform, Oil and Grease, Total Dissolved Solids and Total Residual Chlorine shall be collected at the spray irrigation pivot. Samples taken in compliance with the monitoring requirements for pH and all composite sampling shall be at the effluent end of the clarifier.

Parameter	Unit Measurement	Monitoring Frequency	Sample Type
Ammonia Nitrogen	mg/L	Monthly	Composite
BOD <sub>5</sub>	mg/L	Twice per month	Composite
Cadmium	mg/L	Annually	Composite
Calcium	mg/L	Annually	Composite
Chloride	mg/L	Quarterly	Composite
Copper	mg/L	Annually	Composite
Effluent Flow	Gal/day	Continuous	Recorded
Fecal Coliform	Col/100 ml	Twice per month	Grab
Lead	mg/L	Annually	Composite
Magnesium	mg/L	Annually	Composite
Nickel	mg/L	Annually	Composite
Nitrate + Nitrite Nitrogen	mg/L	Monthly	Composite
Oil and Grease	mg/L	Monthly	Grab
Organic Nitrogen	mg/L	Monthly	Calculation
pH	S.U.	Daily	Grab
Potassium	mg/L	Quarterly	Composite
Sodium Adsorption Ratio	N/A	Quarterly	Calculation
Sodium	mg/L	Quarterly	Composite
Total Dissolved Solids	mg/L	Quarterly	Grab
Total Nitrogen	mg/L	Monthly	Composite
Total Nitrogen Loading	lbs/acre	Monthly	Calculation
Total Phosphorus	mg/L	Monthly	Composite
Total Phosphorus Loading	lbs/acre	Monthly	Calculation
Total Residual Chlorine	mg/L	Daily	Grab
Total Suspended Solids	mg/L	Twice per month	Composite
Zinc	mg/L	Annually	Composite

### 3. GROUNDWATER MONITORING REQUIREMENTS

Groundwater samples shall be taken from each monitoring well for the facility. Groundwater monitoring well locations are depicted on the Site Map found on Page 3 of this Permit.

Samples taken in compliance with the monitoring requirements specified shall be taken at each monitoring well in accordance with procedures approved by the Department and listed in the State of Delaware, Field Manual for Groundwater Sampling (Custer, 1988).

Groundwater monitoring results for each monitoring well shall be reported using the State of Delaware Well Identification Tag Number that is assigned on all wells in accordance with the Delaware Regulations Governing the Construction and Use of Wells, Section 10, A.

All field sampling logs and laboratory results for samples obtained from a well shall be identified by the DNREC ID affixed to the well.

Groundwater samples shall be tested from the following wells for the following parameters:

Local ID	DNREC ID	Field	Local ID	DNREC ID	Field
MW-13	243364	WHBJ-5	MW-31	70662	WHBJ-7
MW-14	243361	WHBJ-4	MW-32	70663	WHBJ-7
MW-15	243359	WHBJ-4/5	MW-33	70664	WHBJ-7
MW-16	243358	WHBJ-1	MW-34	70665	WHBJ-3
MW-17	243357	WHBJ-4/7	MW-35	70666	WHBJ-2
MW-18	243356	WHBJ-3	MW-36	70667	CB-3DW CB-
MW-19	243355	WHBJ-2	MW-37	70668	3B/C/D
MW-20	243354	WHBJ-2	MW-38	192056	CB-3DW
MW-21	243353	WHBJ-2	MW-40	70671	WHBJ-1 CB-
MW-22	243362	WHBJ-4	MW-41	70672	3/B/C
MW-23	243365	CB-3/B/C	MW-42	70673	CB-3C
MW-25	243351	Next to 15	MW-43	70674	CB-3
MW-26	243363	WHBJ-4	MW-44	70675	CB-3
MW-27	243352	WHBJ-7	MW-45	70676	CB-3/3A
MW-28	70659	WHBJ-6	MW-46	70677	CB-3A
MW-29	70660	WHBJ-6	MW-47	70678	CB-3A
MW-30	70661	WHBJ-6			

GROUNDWATER MONITORING REQUIREMENTS (con't)

Parameter	Unit Measurement	Measurement Frequency	Sample Type
Ammonia as Nitrogen	mg/L	Quarterly	Grab
Arsenic	mg/l.	Quarterly	Grab
Chloride	mg/l.	Quarterly	Grab
Depth to Water	hundredths of a foot	Quarterly	Field Test
Dissolved Oxygen	mg/l.	Quarterly	Field Test
Focal Coliform	Col/100ml.	Quarterly	Grab
Nitrate + Nitrite as Nitrogen	mg/l.	Quarterly	Grab
pH	S.U.	Quarterly	Field Test
Sodium Specific	mg/l.	Quarterly	Grab
Conductance	µS/cm	Quarterly	Field Test
Temperature	°C	Quarterly	Field Test
Total Dissolved Solids	mg/L	Quarterly	Grab
Total Nitrogen	mg/L	Quarterly	Grab
Total Phosphorus	mg/L	Quarterly	Grab

4. GROUNDWATER TABLE ELEVATION MONITORING REQUIREMENTS

N/A

3. LYSIMETER MONITORING REQUIREMENTS

Samples shall be taken from each lysimeter for the facility. Lysimeter locations are depicted on the Site Map found on Page 3 of this Permit.

Samples must be tested from the following wells for the following parameters. The constituents are listed below in highest priority first. In the event that sufficient sample volume may not be obtained to test for all parameters listed, the sample shall be tested for as many constituents possible in the following order:

Local ID	DNRUC ID	Associated Pivotal	Notes
LY-1	257012	CB-3	Replaced well 233818 on 2/7/2017
LY-2	257636	CB-3C	Replaced well 233819 on 3/29/2017
LY-3	257616	CB-3DW	Replaced well 233820 on 2/7/2017
LY-4	233821	WHBJ-1	
LY-5	233822	WHBJ-3	
LY-6	233823	WHBJ-7	
LY-7	233824	WHBJ-6	

Parameter	Unit	Measurement	Sample Type
Total Nitrogen	mg/L	Quarterly	Grab
Total Phosphorus	mg/L	Quarterly	Grab
Nitrate + Nitrite as Nitrogen	mg/L	Quarterly	Grab
Ammonia as Nitrogen	mg/L	Quarterly	Grab
Chloride	mg/L	Quarterly	Grab
Sodium	mg/L	Quarterly	Grab
Total Dissolved Solids	mg/L	Quarterly	Grab
pH	S.U.	Quarterly	Field Test
Specific Conductance	µS/cm	Quarterly	Field Test
Temperature	°C	Quarterly	Field Test



## 6. SOIL MONITORING REQUIREMENTS

Composite soil samples representing each soil series within the wetted spray field shall be taken separately from both soil depths of 0-12 inches and 12-24 inches. A minimum of one composite sample for each of the both aforementioned depths is required for every 20 acres of each soil series. The composite soil sampling must represent the average conditions in the sampled body of material. The discrete samples that are to be composited must be collected from the same soil horizon and depth interval.

Soil sample locations shall be plotted on a sealed drawing and labeled consistent with the sample nomenclature. Each field must also be identified so that sample results may be tracked and properly assessed for field life limiting factors.

Soil chemical testing should be in accordance with Methods of Soil Analysis published by the American Society of Agronomy, Madison, Wisconsin.

If a Compliance Monitoring Report (CMR) is required for the facility, testing for Cadmium, Nickel, Lead, Zinc and Copper should be performed approximately one year prior to permit renewal so results may be utilized by the Permittee in the CMR. Reference Part IV.A.2 of the Permit and Section 6.5.4 of the Regulations regarding CMR requirements.

Parameter	Unit Measurement	Measurement Frequency	Sample Type
pH	S.U.	Annually	Soil Composite
Organic Matter	%	Annually	Soil Composite
Phosphorus (as P <sub>2</sub> O <sub>5</sub> )	mg/kg	Annually	Soil Composite
Potassium	mg/kg	Annually	Soil Composite
Sodium Adsorption Ratio	meq/100g	Annually	Soil Composite
Arsenic	mg/kg	Once per 5 years	Soil Composite
Cadmium	mg/kg	Once per 5 years	Soil Composite
Nickel	mg/kg	Once per 5 years	Soil Composite
Lead	mg/kg	Once per 5 years	Soil Composite
Zinc	mg/kg	Once per 5 years	Soil Composite
Copper	mg/kg	Once per 5 years	Soil Composite
Cation Exchange Capacity	meq/100g	*Only if soil pH changes significantly	Soil Composite
Phosphorus Adsorption (Mehlich 3 acceptable)	meq/100g	**Only if soil phosphorus levels become excessive for plant growth	Soil Composite
Percent Base Saturation	%	*Only if soil pH changes significantly	Soil Composite

\*A significant change in soil pH is defined as a change of one or more standard units from the original value established in the Design Development Report.

\*\* Excessive levels of soil phosphorus are defined by the Delaware Nutrient Management Commission. Soil phosphorus levels must be tested in accordance with the University of Delaware soil testing methods (Gantley, 2002). If the soil phosphorus levels become excessive, the Permittee must perform a Phosphorus Site Index (PSI) study. The results must be submitted to the Groundwater Discharges Section within 30 days of completion. Based on these, the Groundwater Discharges Section may require the Permittee to submit a plan for detailing steps to reduce the phosphorus loading rates at the site.

**7. VEGETATION MONITORING**

In the year prior to permit expiration, a minimum of one composite sample for each field is required upon each harvest. If a crop rotation is utilized either in alternate years or in the same year, the aforementioned requirement must be duplicated for each crop type. If a Compliance Monitoring Report (CMR) is required for the facility, testing should be performed approximately one year prior to permit renewal so results may be utilized by the Permittee in the CMR. Reference Part IV.A.2 of the Permit and Section 6.5.4 of the Regulations regarding CMR requirements.

Parameter	Unit Measurement	Measurement Frequency	Sample Type
Yield	Bushels/acre and lbs/acre	Per harvest	Vegetation Composite
Nitrogen	% and lbs/acre	Per harvest	Vegetation Composite
Phosphorus	% and lbs/acre	Per harvest	Vegetation Composite
% Moisture	%	Per harvest	Vegetation Composite

**8. OPERATIONS MONITORING REQUIREMENTS**

**a. Spray Field Applications**

Parameter	Unit Measurement	Monitoring Frequency	Sample Type
Fertilizer	lbs/acre per field/zone/pivot	Monthly	Reported
Nitrogen Fertilizer	lbs/acre per field/zone/pivot	Monthly	Reported
Phosphorus	lbs/acre per field/zone/pivot	Monthly	Reported

**b. Treatment System**

Parameter	Sample Location	Unit Measurement	Monitoring Frequency	Sample Type
Lagoon Levels	Lagoons	Feet of depth of lagoon	Weekly	Field Test

**9. SURFACE WATER MONITORING REQUIREMENTS**

N/A

## B. MONITORING SPECIFICATIONS AND REPORTING REQUIREMENTS

### 1. Representative Sampling

Samples and measurements taken as required in the operation permit shall be representative of the volume and nature of the monitored discharge. If there has been significant increase (> 25%) in the characterization of any one parameter of the effluent wastewater as established in the Design Engineer Report, the permittee shall resample the wastewater and submit the additional analyses to the Department. The permittee shall re-characterize the wastewater to determine if a change in treatment is required and/or if the land limiting constituent has changed. If a change in treatment is required and/or if the land limiting constituent has changed, a revised Design Engineer Report shall be submitted to the Department. After a review of these results, the Department may invoke the provisions of Part V.A.1 of this permit.

### 2. Reporting

Monitoring results obtained during the previous one month/quarter shall be summarized and reported on an approved monitoring report form(s) postmarked no later than the 28th day of the month following the compliance reporting period. Laboratory analytical results and sampling logs must be submitted with the corresponding month's monitoring report. Signed reports/forms, laboratory analytical results, laboratory sampling logs and field data sheets shall be submitted in one complete package to the Department at the following address:

Groundwater Discharges Section  
Division of Water  
Department of Natural Resources and Environmental Control  
89 King Hwy  
Dover DE 19901  
(302) 739-9948 Office  
(302) 542-9735 Cell

3. Monitoring results reported as less than the detectable limit should be reported with the less than symbol "<" before the detection limit. The full detection limit value must be utilized in any necessary calculations. The less than symbol must be carried through the calculation. The resulting value must include any appropriate less than or greater than symbol resulting from the calculation.

### 4. Additional Monitoring by Permittee

If the permittee monitors any parameter at the location(s) designated herein more frequently than required, using approved analytical methods, the results shall be reported to the Department on an approved monitoring report form. Such increased frequency shall also be indicated.

### 5. Annual Report

The Permittee shall submit to the Department's Groundwater Discharges an Annual Report summarizing the operations, management, administration and maintenance of the facility for the calendar year. The Annual Report must be submitted to the Department's Groundwater Discharges on or before February 28th of each year. The Annual Report must include all applicable items found in Section 6.8.2.4.1 and Section 6.9 of the Regulations.

### 6. Test Procedures

Test procedures for analysis of pollutants shall conform to the applicable test procedures identified in 40 CFR, Part 136 or the most recently adopted copy of Standard Methods unless otherwise specified in this permit.

**7. Recording of Results**

For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information:

- a. The exact place, date and time of sampling and/or measurement;
- b. The person(s) who performed the sampling and/or measurement;
- c. The date(s) the analyses were performed and the time the analyses were begun;
- d. The person(s) who performed the analyses; and
- e. The results of each analysis.

**8. Records Retention**

All records and information resulting from the monitoring activities required by this permit or the Regulations including all records of performed analyses, calibration and maintenance of instrumentation and recording from continuous monitoring instrumentation shall be retained for five years. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the permittee or as requested by the Department.

**9. Availability of Reports**

All reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department of Natural Resources and Environmental Control. Monitoring data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in 7 Del. C., §6013.

**10. Operator Log**

An operator log must be kept on site at all times. Each spray system section shall be numbered and referred to by number in the operator log. All records and reports shall also be kept in a bound log book on site at all times and must be made available upon request for review by the Department. This log shall, at a minimum, include the applicable items listed in Section 6.7.3 of the Regulations.

**11. Quality Assurance Practices**

The Permittee is required to show the validity of all monitoring data by requiring its laboratory to adhere to quality assurance practices in accordance with Section 6.8.2.4 of the Regulations.

## PART III

### A. OPERATIONAL REQUIREMENTS

#### 1. Groundwater Requirements

Operation of the wastewater treatment facility and spray irrigation system shall not cause the quality of Delaware's groundwater resources to be in violation of applicable Federal or State Drinking Water Standards on an average annual basis.

#### 2. Facilities Operation

The Permittee must properly maintain and operate all structures, pipelines, systems and equipment for collection, treatment control and monitoring which are used by the permittee to achieve compliance with the terms and conditions of the permit. Proper operation and maintenance includes, but is not limited to, effective performance based on designed facility removals, adequate funding, effective management, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures.

#### 3. The spray irrigation fields shall be managed to assure at a minimum that:

- a. Spray irrigation of wastewater shall only occur on fields being prepared for planting or already planted with a crop and shall not occur on fields with crops not actively growing or on voluntary vegetation.
  - b. The spray fields shall be maintained in such a manner as to prevent wastewater pooling and/or discharge of wastewater to any surface waters. Should pooled areas become evident, spraying on those areas shall be prohibited until saturated conditions no longer exist.
  - c. Aerosols or nuisance odors shall not extend beyond the boundary of the spray irrigation site when treated wastewater is being applied. If odors are produced that are considered to be a public nuisance, the Permittee shall take the necessary steps to eliminate such odors. All action taken shall be reported to the Department in accordance with Part IV.A.4 of this permit.
  - d. Erosion controls must be employed to prevent wastewater runoff from the spray irrigation fields. The Permittee must notify the Department immediately if any wastewater runoff occurs.
  - e. The spray irrigation field's crops must be maintained in optimal condition, including any necessary weed management, reseeding, or other vegetative management practices.
  - f. Effective vegetative management shall be provided such that crops harvested on the spray irrigation sites are removed from the sites.
  - g. Forage crops must be harvested and removed from the irrigation field(s) at least twice a year. Crops harvested must be removed from the irrigation site within six (6) months of harvest.
  - h. The wastewater must be applied in a manner such that the application is even and uniform over the irrigation area.
4. Spray irrigation is prohibited when saturated or frozen soil conditions exist except on fields identified in Part I.I.I.
5. The groundwater mound created by the added infiltration shall at no time reach within two feet of the ground surface in any section of the spray irrigation fields. Should the groundwater mound exceed this limit, the Permittee shall cease all irrigation of wastewater to the affected fields until the groundwater mound recedes to acceptable levels.
6. Connections or additions to the spray irrigation system other than those indicated on the approved plans are prohibited without prior approval from the Department's Groundwater Discharges Section.

7. Roof downspouts, foundation drains, area drains, storm sewers, combined sewers or appurtenances thereto or any sewer or device carrying storm water shall not be connected to the spray irrigation system.
8. The Permittee shall take appropriate measures to protect the spray irrigation system from damage due to sub-freezing conditions.
9. Any leaks shall be reported to the Department and repaired immediately.
10. Signs
  - a. Limited Public Access: Signs must be posted on all limited public access spray fields utilized to irrigate treated wastewater to prohibit public contact. The signs must indicate that the water being irrigated is treated wastewater. The signs must be legible. Limited public access sites must have signs posted on the perimeter every 1,000 feet, at a minimum, and at all entry points. Unlimited public access sites must have signs posted at all entry points.
  - b. Unlimited Public Access: Unlimited public access sites must have advisory signs posted at all entry points that indicate the site is spray irrigated with treated wastewater. Verbiage should include the following wording: "RECYCLED WASTEWATER DO NOT DRINK". Alternate verbiage may be used if approved in writing by the Department.
11. Potable ground or surface water may be used for distribution system testing and irrigation to establish vegetation when sufficient treated effluent is not available.
12. Phased Systems
  - a. Once an operation permit has been issued and the wastewater flow reaches 80% of the permitted treatment capacity for the constructed phase based on a period of seven (7) consecutive days, the Permittee must submit written notification to the Department. The written notification must include a work plan for construction of the next permitted phase. The Permittee must submit a construction permit application, plans and specifications and Design Engineer Report with applicable fees if the next phase has not yet been permitted or if there are changes to the previously permitted design.
  - b. Any flow above the permitted flow for a phase shall not be allowed to be discharged to the system until construction is completed on the following phase and an operating permit has been issued or amended by the Department for the next phase.
  - c. Required documents for connecting subdivisions may be found in Section 6.5.10.1.1 of the Regulations.
13. In the event that the permittee installs new monitoring wells or replaces any existing monitoring wells, the Permittee shall submit to the Department's Groundwater Discharges Section new elevation details relative to the common benchmark previously established. Additionally, the permittee shall conduct a groundwater quality sampling program prior to initiation of wastewater disposal activities on the area incorporating the well. The sampling program shall be sufficient to establish representative groundwater quality at each well prior to initiation of the wastewater disposal activities. A minimum of three samples shall be collected at least one month apart and analyzed. A summary report detailing all analyses shall be submitted to the Department's Groundwater Discharges Section prior to initiation of wastewater disposal activities. Analyses shall include the parameters listed in Section 6.8.1 of the Regulations.
14. The Permittee shall calibrate all flow meters in accordance with the Manufacturer's recommendations. Calibration shall include, but not be limited to influent, effluent, continuous online turbidity and chlorine residual monitors. The calibration documentation must be submitted with the Annual Report in accordance with Part 11.B.5.
15. The Permittee shall operate and maintain the land treatment system in accordance with the approved Operation and Maintenance Plan (O&M). A copy of the O&M must be on site at all times. The Permittee must maintain the O&M's accuracy and applicability in accordance with both their Permit and the Regulations. In the event of a discrepancy between the O&M and the Permit or Regulations, the requirements of the Permit and the Regulations would govern.

16. At least two feet of freeboard, measured vertically from the lowest point of the berm, is required for all ponds. The lowest point of the berm must be determined and marked.

The Permittee must notify the Department's Groundwater Discharges Section in writing prior to utilizing the freeboard in any lagoon or immediately upon unexpected encroachment into freeboard. In the event of encroachment into freeboard, Permittee shall contact the Groundwater Discharges Section to coordinate relief measures. In the event of an emergency, Permittee may contact the Department at the telephone numbers cited in Part H.B.2 of this permit; however, written notification must subsequently be provided within 5 days of encroachment.

17. If the facility does not treat sewage and has a storage tank that requires cleanout, and if the permittee intends to land apply material collected from the cleanout onto the spray irrigation field, the Permittee must analyze the material for nutrients and any other applicable parameters of concern as determined by the Groundwater Discharges Section. Prior to tank cleanout being performed, Permittee must submit to the Groundwater Discharges Section a report including the results, the frequency and estimated volume of material to be applied, and how and where it will be applied. The report must include a mathematical analysis determining any nitrogen loading from the tank cleaning combined with nitrogen loading from wastewater application will not exceed the allowable nitrogen load.
18. Fencing is required at treatment facilities, pump stations and storage/treatment ponds. Fencing of spray fields is not required.
19. The collection and channelization of irrigated wastewater for purposes other than retreatment is prohibited.
20. Direct application of treated wastewater to drainage ditches, any water bodies, and wetlands is prohibited.
21. Emergency Repairs

Emergency repairs or the replacement of critical "like kind" components of the wastewater treatment facility necessary for the continued operation of the facility may be performed without first obtaining a construction permit from the Department.

A report must be submitted to the Department within five (5) days of completion of the emergency repairs. The report must summarize the nature of the emergency and the repairs performed. All violations must also be reported in accordance with Section 6.5.9.

22. Adverse Impact

The Permittee shall take all steps to minimize any adverse impact to the Waters of the State resulting from operation under this permit. Such steps shall include, but not be limited to, accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge or mitigation of such impacts.

23. Bypassing

The diversion of flow from any portion of the treatment facility's process flow (including, but not limited to, pretreatment, storage, distribution and final application) necessary to maintain compliance with the terms and conditions of this permit is prohibited unless:

- a. The bypass is unavoidable to prevent personal injury, loss of life, severe property damage, or materially adversely affect public health and/or the environment; or
- b. There are no alternatives readily available

The Groundwater Discharges Section must be orally notified within 24 hours after such bypass; and, a written submission regarding the bypass must be submitted within five days of the Permittee's becoming aware of the bypass. Where the need for a bypass is known (or should have been known) in advance, this notification must be submitted to the Groundwater Discharges Section for approval at least ten days prior, or as soon as possible, before the date of bypass.

The treatment facility must be repaired and restored to the permitted design operations process flow.

24. Removed Substances

Solids, sludges, filter backwash or other pollutants removed in the collection, conveyance, or treatment of wastewater shall be disposed of in a manner such as to prevent any pollutant from entering the surface water or groundwater and to comply with applicable federal or state laws and regulations

25. Power Failures

An alternative power source, which is sufficient to operate the wastewater treatment and disposal facilities, shall be available. If such alternative power source is not available, the Permittee shall halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater facilities.



## PART IV

### A. MANAGEMENT REQUIREMENTS AND RESPONSIBILITIES

#### 1. Initiation of Facility Operations Notification

If this permit is for initial operations following construction, the Permittee shall notify the Department in writing within 24 hours of the initiation of operations.

#### 2. Operation Permit Re-issuance

At least 180 days before the expiration date of this permit, the Permittee must submit an application for renewal or notify the Department of the intent to cease discharging by the expiration date. The application package for systems with a design flow  $\geq$  100,000 gpd, must include a five (5) year Compliance Monitoring Report (CMR). The CMR must be in accordance with Section 6.5.4.3 of Regulations. In the event that a timely and complete application has been submitted as determined by the Department, and the Department is unable, through no fault of the Permittee, to issue a new permit before the expiration date of this permit, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable until a decision is made on the new application.

#### 3. Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

Any anticipated facility expansions, production increases, or process modifications that will result in new, different, or increased discharges of pollutants must be reported in writing to the Department's Groundwater Discharges Section for approval. A new permit may be required.

Any other activity which would constitute cause for modification or revocation and reissuance of this permit as described in Part V.A.1 of this permit shall be reported to the Groundwater Discharges Section. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

#### 4. Non-compliance Notification

The Permittee shall report to the Department's Enforcement Section at (800) 662-8802 any unpermitted release or discharge of any contaminant into the air, or a pollutant, including petroleum substances, into surface waters, groundwater, or onto land as soon as the Permittee has knowledge of, or should have had knowledge of, the release or discharge.

The Permittee shall report to the Groundwater Discharges Section orally within 24 hours from the time the Permittee became aware of any non-compliance that may endanger the public health or the environment by contacting the Groundwater Discharges Section at the telephone numbers cited in Part II.B.2 of this permit.

If for any reason the Permittee does not comply with, or will be unable to comply with, any effluent limitations or other conditions specified in this permit, the Permittee shall provide the Department with the following information in writing, within five days of becoming aware of any actual or potential non-compliance:

- a. A description and cause of the non-compliance with any limitation or condition;
- b. The period of non-compliance including exact dates and times; or, if not yet corrected, the anticipated time the non-compliance is expected to continue; and

- c. The steps being taken or planned to reduce, eliminate and/or prevent recurrence of the non-compliant condition.

#### 5. Facility and Construction Changes

The Permittee shall submit a written report to the Department for review and approval, of any changes to the facility or construction of the system within the following time periods:

- a. Thirty days before any planned activity, physical alteration to the permitted facility or addition to the permitted facility if that activity, alteration or addition would result in a change in information that was previously submitted to the Department;
- b. Thirty days before any anticipated change which would result in noncompliance with any permit condition or the regulations; or
- b. Immediately after the Permittee becomes aware of relevant facts omitted from, or incorrect information submitted in, a permit application or report to the Department.

#### 6. Right of Entry

The permittee shall allow the Department entry and access, consistent with 7 Del.C. Ch. 60, to:

- a. Enter the permitted facility.
- b. Inspect any records that must be kept under the conditions of the permit.
- c. Inspect any facility, equipment, practice, or operation permitted or required by the permit.
- d. Sample or monitor for the purpose of ensuring permit compliance of any substance or any parameter at the facility.

#### 7. Permit Transferability

Permits may be transferred to a new owner or operator. The permittee must notify the Department by requesting a change of ownership of the permit before the date of transfer. The transfer must be consistent with any notarized legal documents and/or CLIN required by the Regulations. The legal documentation must be provided with the application. The application must be received 30 days before the transfer.

- a. No person shall transfer a permit from one (1) person to another unless 30 days written notice is given to the Department, indicating the transfer is agreeable to both persons, and approval of such transfer is obtained in writing from the Department, and any conditions of the approval of such transfer is obtained in writing from the Department, and any conditions of the transfer approved by the Department are complied with by the transferor and the transferee.
- b. The notice to the Department shall contain a written agreement between the transferor and the transferee, indicating the specific date of proposed transfer of permit coverage and acknowledging responsibilities of current and new permittees for compliance with and liability for the terms and conditions of this permit. The notice shall be signed by both the transferor and the transferee.

## PART V

### A. PROVISIONS

#### 1. Permit Revocation

The Department may revoke a permit if, among other things, the permittee violates any permit condition, these regulations, fails to pay applicable Departmental fees, obtains the permit by misrepresentation or fails to fully disclose all relevant facts.

Except in cases of emergency, the Department shall issue a written notice of intent to revoke to the permittee prior to final revocation. Revocation shall become final within 20 days of receipt of the notice by the permittee, unless within that time the permittee requests an administrative hearing in writing.

The Department shall notify the permittee in writing of any revocation hearing at least 20 days prior to the date set for such hearing.

If the Department finds the public health, safety or welfare requires emergency action, the Department shall incorporate findings in support of such action in a written notice of emergency revocation issued to the permittee. Emergency revocation shall be effective upon receipt by the permittee. Thereafter, if requested by the permittee in writing, the Department shall provide the permittee a revocation hearing.

#### 2. Permit Modifications/Amendments

In consultation with the permittee, the Department may modify or amend an existing permit provided that the modifications would not result in an increased impact or risk to the environment or to public health.

#### 3. State Laws

This permit shall not be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation.

#### 4. Property Rights

The issuance of this permit does not convey any property rights of either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

#### 5. Severability

The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit, to any circumstances is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

#### 6. This permit does not relieve the Permittee of complying with any applicable Federal, State or local regulations.

#### 7. In the event that the Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems or applicable federal regulations are revised, this permit may be opened and modified accordingly after notice and opportunity for a public hearing.

#### 8. This permit supersedes all previous spray irrigation operation permits issued to the Permittee.