AUTHORIZATION TO OPERATE AND DISCHARGE

UNDER THE LAWS OF THE

STATE OF DELAWARE

PERMITTEE: Artesian Wastewater Management, Inc. (AWMI)
664 Churchmans Road
Newark, DE 19702

FACILITY: Sussex Regional Recharge Facility (SRRF)

DISCHARGE(S): Spray Irrigation

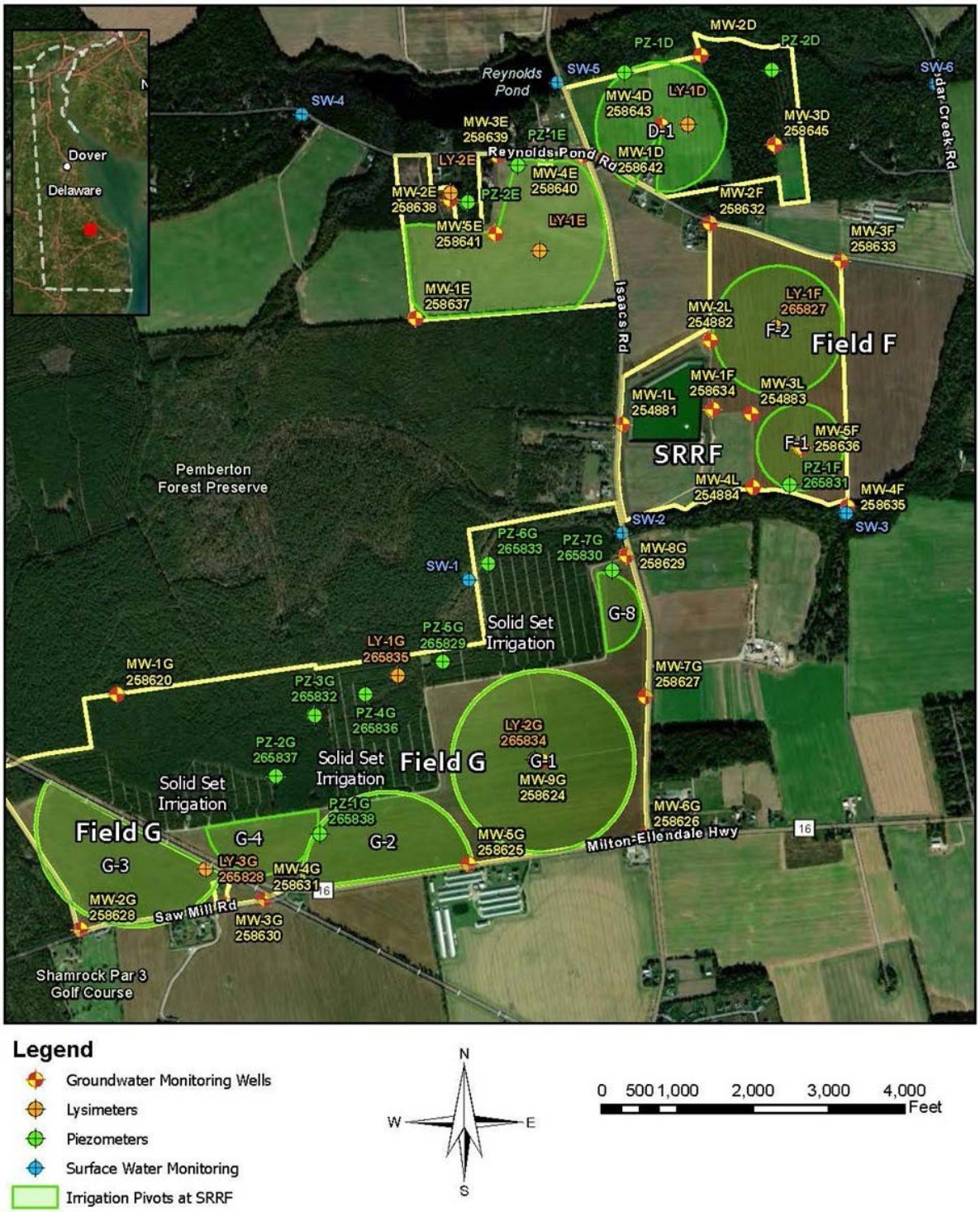
1. Pursuant to the provisions of *7 Del. C.* § 6003, the Permittee is herein authorized to operate the above referenced wastewater treatment system and to discharge treated wastewater via Spray Irrigation for final disposal.

2. The Delaware Department of Natural Resources and Environmental Control's (the Department or DNREC) purpose in issuing this Permit, and in imposing the requirements and conditions specified herein, is for the protection of public health and the environment as required by 7 DE Admin. C. 7101 *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* (the Regulations). The effluent limitations, monitoring requirements and other Permit conditions are set forth herein.

_____ _____

John J. Rebar, Jr. Date Signed
Environmental Program Manager II
Division of Water - CGSS
(302)739-9946

SITE MAP


Dover
Delaware
Reynolds Pond
SW-4
SW-5
SW-6
MW-2D
PZ-1D
PZ-2D
MW-4D 258643
LY-1D
D-1
MW-3D 258645
MW-3E 258639
PZ-1E
Reynolds Pond Rd
MW-1D 258642
LY-2E
MW-4E 258640
MW-2E 258638
PZ-2E
MW-5E 258641
LY-1E
MW-2F 258632
MW-3F 258633
MW-1E 258637
Isaacs Rd
LY-1F 265827
MW-2L 254882
F-2
Field F
MW-1F 258634
MW-3L 254883
MW-1L 254881
MW-5F 258636
F-1
SRRF
PZ-1F 265831
MW-4L 254884
MW-4F 258635
SW-3
SW-2
Pemberton Forest Preserve
PZ-6G 265833
PZ-7G 265830
MW-8G 258629
SW-1
G-8
Solid Set Irrigation
PZ-5G 265829
LY-1G 265835
MW-1G 258620
MW-7G 258627
PZ-3G 265832
PZ-4G 265836
LY-2G 265834
PZ-2G 265837
Solid Set Irrigation
Field G
G-1
MW-9G 258624
Solid Set Irrigation
PZ-1G 265838
Field G
G-4
G-2
MW-6G 258626
MW-5G 258625
Milton-Ellendale Hwy
16
G-3
LY-3G 265828
MW-4G 258631
16
MW-2G 258628
Saw Mill Rd
MW-3G 258630
Shamrock Par 3 Golf Course
Legend
Groundwater Monitoring Wells
Lysimeters
Piezometers
Surface Water Monitoring
Irrigation Pivots at SRRF
N
W
E
S
0 500 1,000 2,000 3,000 4,000
Feet

PART I

A. GENERAL DESCRIPTION

Pursuant to the provisions of 7 Del. C. §6003 and 7 Del. Admin. C. §7101 *Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems* (the Regulations), Artesian Wastewater Management, Inc. (the Permittee or AWMI) is authorized to operate and maintain the Sussex Regional Recharge Facility (SRRF) to serve as a regional on-site wastewater treatment and disposal system (OWTDS) meeting the existing and future wastewater treatment and disposal needs of AWMI's service territories in Sussex County, Delaware. Operations are divided into multiple Phases. AWMI is currently operating in Phase 2.

AWMI is currently authorized to receive treated poultry processing wastewater (treated effluent) from the Allen Harim Foods Harbeson Processing Facility's wastewater treatment system at SRRF. The poultry processing facility's wastewater treatment system is owned by Allen Harim Foods, LLC and operated in accordance with State Permit No. 597261-01 (and as amended). The average daily flow of treated effluent received at SRRF is 1.5 million gallons per day (MGD) with a peak flow of 2.0 MGD. Treated effluent is stored (at SRRF) in a synthetically lined lagoon prior to being discharged via spray irrigation to approximately 1,714 acres of agricultural fields located in Sussex County, Delaware.

Treated effluent is authorized to be discharged via spray irrigation to Fields F and G. Fields D and E will be permitted for use upon completion of the Schedule of Compliance requirements iterated in Part IV.A.2.d of this Permit and upon written approval from the Department.

AWMI is also authorized to receive and treat wastewater from within AWMI's service territories in Sussex County, Delaware at SRRF. The wastewater treatment system includes a 3.0 million gallon (MG) combined equalization and off-spec water diversion lagoon, a headworks system consisting of screening and grit removal, an influent lift station, a Hybrid Bardenpho treatment process, two cloth media filters, a UV system for disinfection, and an effluent lift station to pump treated effluent to the existing 90 MG storage lagoon. Treated wastewater from the SRRF treatment system is mixed with the treated effluent from Allen Harim's treatment system within the existing 90 MG storage lagoon and discharged via spray irrigation to agricultural fields (see Spray Fields on Page 4).

Upon completion of proposed advanced wastewater treatment system upgrades authorized by Construction Permit No. 359288-0*, and upon receiving written approval from the Department, SRRF will be authorized to receive and treat an increased capacity of wastewater from within AWMI's service territories in Sussex County, Delaware.

The upgrades increase treatment capacity to 1.875 MGD and include new treatment equipment using the same treatment technology as the existing treatment facilities. Upgrades include a mechanical influent screen, four additional hybrid Bardenpho treatment trains with integral clarifiers and aerated sludge holding, influent pumps (installed in existing wet well), cloth media filtration system, UV system, and effluent pumps (installed in existing wet well). Treated wastewater from the upgraded SRRF treatment system will be mixed with the treated effluent from Allen Harim's treatment system and with the Phase 2 treatment within the existing 90 MG storage lagoon and discharged (via spray irrigation) to the agricultural fields previously permitted under Phase 1 (see Spray Fields on Page 4).

Treatment System Location

SRRF is located on Sussex County Parcel Number: 2-35 6.00 28.09; on a 75-acre site south of Reynolds Pond Road, east of Route 30, north of Ingram Branch and Route 16, and west of Cedar Creek Road, Sussex County, Delaware.

Interconnections

AWMI is authorized to transfer flows to other AWMI owned and Sussex County owned wastewater treatment facilities for additional treatment and/or disposal as approved by Department issued Permits.

Discharges

Treated effluent is discharged via spray irrigation onto privately owned agricultural land, under a lease held in perpetuity by AWMI as the wastewater utility provider. The spray fields have been permanently placed in an Agricultural Preservation Easement by the Delaware Agricultural Lands Preservation Foundation.

This Permit, at the time of issuance, authorizes discharge only on Spray Fields F and G.

Upon completion of the Schedule of Compliance requirements delineated in Part IV.A.2.d of this Permit, the Permittee will be authorized to discharge on Spray Fields D and E.

Spray Fields discharge areas are listed below.

Field	Tax Map ID	Gross Area (acres)	Crop Spray Area (acres)	Woods Spray Area (acres)	Total Spray Area (acres)
D[2,3]	235-6.00-11.00 235-6.00-11.01 235-6.00-11.02 235-7.00-1.00 235-7.00-164.00	125.1	58.0	32.7	90.7
E[2,4]	235-6.00-21.00	119.0	90.5	0	90.5
F	235-7.00-7.00	126.5	110.5	0	110.5
G	235-13.00-6.05 235-13.00-6.06	590.5	276.1	200.5	476.5

Spray Fields [taken from 2019.07.17 Lagoon Pump and Disposal Record Drawings pdf page 15]

B. DOCUMENTATION

The On-Site Wastewater Treatment and Disposal System (OWTDS) must be operated in accordance with the Administrative Record[1] incorporated herein; 7 *Del. C*. Chapter 60, 7 DE Admin. Code 7101, Delaware's *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal System,* and this Permit.

Phase 1

1. March 12, 2013, Secretary's Order No. 2012-W-0052
2. May 5, 2017, Application Package for an amended Construction Permit for the Artesian Northern Sussex Regional Water Recharge Facility (ANSRWRF) Phase 1 submitted by AWMI
3. Application Package includes Application Form, Amended Design Development Report (DDR), Drawings and Specifications
4. August 18, 2017, Amended DDR Addendum 1 submitted by AWMI providing requested additional information
5. June 12, 2018, Amended DDR Addendum 2 submitted by AWMI providing a revised drawing of surface water monitoring locations
6. November 2, 2017, Secretary's Order No. 2017-W-0029
7. August 17, 2018, Application for a Construction Permit Extension
8. July 17, 2019, Spray Irrigation Permit Application
9. July 17, 2019, Operation and Maintenance Plan
10. December 9, 2021, AWMI Comment Letter

Phase 2

11. February 8, 2021, Application
12. February 4, 2021, (inadvertently dated 2020) AWMI letter providing resubmittal and addressing comments outlined in DNREC-GWDS's November 30, 2020 letter
13. February 4, 2021, Application Form for an Amended Operations Permit
14. February 3, 2021, Application Form for a Construction Permit
15. February 4, 2021, (inadvertently dated 2020) Artesian letter providing Applications
16. February 2021, Design Engineer Report - Sussex Regional Recharge Facility (SRRF) - Phase 2 prepared by Artesian Resources Corp. for Artesian Wastewater Management, Inc.
17. May 3, 2023, revised Nitrogen Balances for Sussex Regional Recharge Facility (SRRF) Phase 1 and Phase 2

[1]Administrative Record" means a compilation of all current, superseding and relevant (written and electronic) documents and information that were before the Department of Natural Resources and Environmental Control, Division of Water (the Department) at the time it made its final decision. An Administrative Record documents the Department's decision-making process and the basis for the decision.

Phase 3

18. May 16,2025, Application Form for a Construction Permit for Phase 3 treatment upgrades.
19. May 16, 2025, Design Engineer Report - Sussex Regional Recharge Facility (SRRF) - Phase 2 prepared by KCI Technologies, Inc. for Artesian Wastewater Management, Inc.
20. May 2025, Drawing Set for SRRF Phase 3 treatment upgrades.

Renewal Operations Permit

21. January 17, 2025, Application Form for renewal of Operations Permit 359288-02 with Compliance Monitoring Report
22. June 6, 2025, AWMI Letter requesting modification to renewal Ops Permit to authorize Phase 3 upon completion of construction and providing schedule to incorporate Fields D and E.

PART II

A. INFLUENT LIMITATIONS

Beginning on the effective date and lasting through the expiration date of this Permit, the Permittee is authorized to receive and treat the volume of wastewater specified below.

1. Phase 1

   a. Allen Harim

   The influent received by SRRF from Allen Harim Foods, LLC (Allen Harim) shall not exceed an average daily flow of 1.5 MGD nor a peak/max daily flow of 2.0 MGD in any calendar month.

   Design Capacity to be received from Allen Harim: 1.5 MGD average daily flow.
   [calculated as Total Monthly Volume divided by number of days in month]

   Peak/Max daily flow from Allen Harim not to exceed: 2.0 MGD.

   A minor modification may be requested from the Permittee for flow increases provided that no changes are proposed for increased disposal capacity and upon Department's approval of Allen Harim's Operations Permit No. 597261-01 (as amended).

2. Phase 2

   a. SRRF Treatment System

   The influent received by SRRF wastewater treatment system shall not exceed an average daily flow of 0.625 MGD nor a peak/max daily flow of 1.25 MGD in any calendar month.

   Design Treatment Capacity: 0.625 MGD.
   [calculated as Total Monthly Volume divided by number of days in month]

   Peak/Max Daily Treatment Capacity: 1.25 MGD.

   b. Combined capacity:

   The combined influent received by SRRF shall not exceed an average daily flow of 2.125 MGD nor a peak/max daily flow of 3.25 MGD in any calendar month.

   Combined Capacity Average Daily Flow: 2.125 MGD.
   [calculated as Total Monthly Volume divided by number of days in month]

   Combined Peak Daily Flow: 3.25 MGD.

Design Flows (MGD)			
	Allen Harim	Phase2 Treatment	Combined
Average Daily Flow	1.5	0.625	2.125
Peak/Max Daily Flow	2.0	1.25	3.25

3. Phase 3

   a. SRRF Treatment System

      The influent received by SRRF wastewater treatment system shall not exceed an average daily flow of 1.875 MGD nor a peak daily flow of 3.75 MGD in any calendar month.

      Design Treatment Capacity: 1.875 MGD.

      [calculated as Total Monthly Volume divided by number of days in month]

      Peak/Max Daily Treatment Capacity: 3.75 MGD.

   b. Combined capacity upon completion of Phase 3:

      The Phase 3 combined influent received by SRRF (influent from Allen Harim plus influent for treatment at SRRF) shall not exceed an average daily flow of 3.375 MGD nor a peak daily flow of 5.75 MGD in any calendar month.

      Combined Capacity Average Daily Flow: 3.375 MGD. [calculated as Total Monthly Volume divided by number of days in month]

      Combined Peak Daily Flow: 5.75 MGD.

Design Flows (MGD)			
	Allen Harim	Phase 3 Treatment	Combined
Average Daily Flow	1.5	1.875	3.375
Peak/Max Daily Flow	2.0	3.75	5.75

B. EFFLUENT LIMITATIONS

1. Fields

   Beginning on the effective date and lasting through the expiration date of this Permit, the Permittee is authorized to discharge treated wastewater from the SRRF to the spray irrigation Fields F and G as identified in Part I.A and depicted on the Site Map of this Permit in the quantity and quality of treated effluent specified below and in accordance with the design documents listed in Part I.B of this Permit.

   Upon completion of the Schedule of Compliance requirements delineated in Part IV.A.2.d and after obtaining written approval from the Department authorizing disposal on Fields D and E in accordance with Part I.F.1.d of this Permit, the Permittee will be authorized to discharge on Spray Fields D and E.

2. Design Disposal Capacity

   Fields F and G

   Design Disposal Capacity: 2.91 MGD

   [Calculated as the average of the two annual design disposal capacities for the two-year crop rotation cycle]

   Fields D, E, F, and G

   Design Disposal Capacity: 3.73 MGD

   [Calculated as the average of the two annual design disposal capacities for the two-year crop rotation cycle]

3. Effluent Discharge Limitations

   a. The quantity of effluent discharged from SRRF to the spray fields and wooded areas shall not exceed the monthly, annual and per acre application rates calculated by the Permittee as provided in the revised Nitrogen Balances for Sussex Regional Recharge Facility (SRRF) Phase 2 dated May 3, 2023 to not cause the groundwater to exceed the drinking water standard for Nitrate (as Nitrogen) within the percolate. All significant figures of the values in the Nitrogen Balance shall be considered for compliance.
   b. Effluent flows shall not exceed the allocated volume per zone/pivot calculated as gal/acre multiplied by the number of acres per zone/field.
   c. Effluent flows shall not exceed the inches/acre-week limitations during any 7 day rolling period.
   d. Effluent flows shall not exceed the discharge limitations in the following table ‘Effluent Volume Limits’:

Table – Effluent Volume Limits

Effluent Volume Limits														
Crop Rotation (Cover-Corn-Wheat)														
Field	**Units**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**SUM**
Field G	MG/month	24.5	23.8	25.9	21.2	54.7	53	54.7	54.7	9.8	16.3	24.7	28.4	391.7
	gal/acre-month	89,092	86,304	93,912	77,031	198,420	192,019	198,420	198,420	35,730	59,100	89,754	102,985	1,421,187
	in/acre-week	0.74	0.79	0.78	0.66	1.65	1.65	1.65	1.65	0.30	0.49	0.77	0.85	-
Field F	MG/month	9.8	9.6	10.3	8.4	21.9	21.2	21.9	21.9	3.8	6.5	9.9	11.2	156.4
	gal/acre-month	88,988	86,893	93,798	76,807	198,420	192,019	198,420	198,420	34,912	58,924	89,609	102,216	1,419,426
	in/acre-week	0.74	0.80	0.78	0.66	1.65	1.65	1.65	1.65	0.30	0.49	0.77	0.85	-
Field D	MG/month	4.8	4.6	5.0	4.1	10.7	10.3	10.7	10.7	1.8	3.1	4.8	5.5	76.1
	gal/acre-month	88,988	86,893	93,798	76,807	198,420	192,019	198,420	198,420	34,912	58,924	89,609	102,216	1,419,426
	in/acre-week	0.74	0.80	0.78	0.66	1.65	1.65	1.65	1.65	0.30	0.49	0.77	0.85	-
Field E	MG/month	8.0	7.8	8.4	6.9	17.9	17.3	17.9	17.9	3.1	5.3	8.1	9.2	127.8
	gal/acre-month	88,988	86,893	93,798	76,807	198,420	192,019	198,420	198,420	34,912	58,924	89,609	102,216	1,419,426
	in/acre-week	0.74	0.80	0.78	0.66	1.65	1.65	1.65	1.65	0.3	0.49	0.77	0.85	-

Effluent Volume Limits

Crop Rotation (Wheat-Soybean-Cover)

Field	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM
Field G	MG/month	25.7	30.8	54.7	53	54.7	4.8	54.7	54.7	53	54.7	16.6	26	483.4
	gal/acre-month	93,314	111,633	198,420	192,019	198,420	17,456	198,420	198,420	192,019	198,420	60,203	94,542	1,753,286
	in/acre-week	0.77	1.02	1.65	1.65	1.65	0.15	1.65	1.65	1.65	1.65	0.51	0.78	-
Field F	MG/month	10.3	12.0	21.9	21.1	21.9	3.6	21.9	21.9	21.2	21.9	6.6	10.4	194.7
	gal/acre-month	93,798	108,617	198,420	191,497	198,420	32,585	198,420	198,420	192,019	198,420	60,515	95,001	1,766,132
	in/acre-week	0.78	1.00	1.65	1.64	1.65	0.28	1.65	1.65	1.65	1.65	0.52	0.79	-
Field D	MG/month	5.0	5.8	10.7	10.3	10.7	1.7	10.7	10.7	10.3	10.7	3.2	5.0	94.8
	gal/acre-month	93,798	108,617	198,420	191,497	198,420	32,585	198,420	198,420	192,019	198,420	60,515	93,798	1,764,929
	in/acre-week	0.78	1.00	1.65	1.64	1.65	0.28	1.65	1.65	1.65	1.65	0.52	0.78	-
Field E	MG/month	8.3	9.8	17.9	17.3	17.9	2.9	17.9	17.9	17.3	17.9	5.4	8.4	158.9
	gal/acre-month	92,596	108,617	198,420	191,497	198,420	32,585	198,420	198,420	192,019	198,420	60,515	93,798	1,763,727
	in/acre-week	0.77	1.00	1.65	1.64	1.65	0.28	1.65	1.65	1.65	1.65	0.52	0.78	-

Effluent Volume Limits

Field G Woods

Field	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM
Field G	MG/month	36.8	27.9	35.5	36.2	39.2	38.4	39.7	39.7	38.4	39.7	38.4	39.7	449.6
	gal/acre-month	183,904	139,399	177,347	180,898	195,830	192,019	198,420	198,420	192,019	198,420	192,019	198,420	2,247,115
	in/acre-week	1.52	1.28	1.47	1.55	1.62	1.65	1.65	1.65	1.65	1.65	1.65	1.65	-

Field D Woods

Field	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM
Field D	MG/month	5.9	4.5	5.8	5.8	6.3	6.2	6.4	6.4	6.2	6.4	6.2	6.4	72.5
	gal/acre-month	182,787	140,116	177,976	180,382	194,812	192,019	198,275	198,420	192,019	198,420	192,019	198,420	2,245,665
	in/acre-week	1.52	1.29	1.48	1.55	1.62	1.65	1.64	1.65	1.65	1.65	1.65	1.65	-

4. The monthly quantity of effluent discharged may not exceed hydraulic loading assimilative capabilities of the fields.
5. The weekly quantity of effluent discharged to any portion of the spray irrigation field shall not exceed 1.65 inches per acre during any 7-day rolling period. This value is a design limitation based on site investigative hydrogeologic work performed.
6. The quantity of effluent discharged to any portion of the spray irrigation field shall not exceed 0.25 inch/acre/hour.
7. There shall be sufficient rest periods between applications to prevent field saturation and runoff from occurring in any part of the field.
8. If the system has a partial circle center pivot, there shall be a minimum one-hour rest period when the center pivot reaches any in-field end stops if the instantaneous application rate exceeds a rate of 0.125 inch/acre in any one hour.

Effluent Concentration Limitations

9. Point of Compliance for Effluent Concentration Limitations
    a. The effluent shall meet all concentration limitations at the at the wastewater treatment system sampling port located immediately after filtration and disinfection.
    b. In addition to meeting the effluent concentration limitation at the at the wastewater treatment system sampling port located immediately after filtration and disinfection, the effluent shall also meet the Total Nitrogen, Total Phosphorus, Fecal Coliform bacteria, pH, Sodium and Chloride and Fats, Oil and Grease effluent limitations at the discharge side of SRRF's irrigation pumps.

Effluent to all discharge points shall at no time exceed the following effluent concentration limitations:

10. Total Nitrogen
    a. Effluent Nitrogen Concentration Limitations

    Allen Harim waste stream

    SRRF is designed to receive an effluent Total Nitrogen concentration of 27.7 mg/L from Allen Harim's wastewater treatment system. [May 5, 2017, Amended Design Development Report ANSRWRF Phase 1].

    SRRF wastewater treatment system

    Treated effluent discharged from the SRRF wastewater treatment system shall not exceed a daily average Total Nitrogen concentration of 10.0 mg/L. 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. [February 2021, Design Engineer Report SRRF Phase 2].

    Combined blended effluent

    The SRRF operation is designed to combine and blend the 0.625 MGD of SRRF treated wastewater with 1.5 MGD of the Allen Harim treated wastewater within the storage lagoon. The SRRF combined effluent shall not exceed a daily average Total Nitrogen concentration

of 22.5 mg/L. The daily average concentration Total Nitrogen 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.

Phase 3

Phase 3 SRRF wastewater treatment system

Treated effluent discharged from the Phase 3 SRRF wastewater treatment system shall not exceed a daily average Total Nitrogen concentration of 10.0 mg/L. 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. [February 2021, Design Engineer Report SRRF Phase 2 and May 2025 Design Engineer Report SRRF Phase 3].

Phase 3 combined blended effluent

The Phase 3 operation is designed to combine and blend 1.875 MGD of SRRF treated wastewater with 1.5 MGD of the Allen Harim treated wastewater within the storage lagoon. The Phase 3 combined effluent shall not exceed a daily average Total Nitrogen concentration of 17.9 mg/L. The daily average concentration Total Nitrogen 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.

b. Effluent Nitrogen Concentration Exceedance Requirements

If the effluent Total Nitrogen concentration from the SRRF treatment system, the Allen Harim waste stream, or the combined blended effluent exceeds 125% of the design value [Design Value + 25%] in any calendar month, the Permittee shall resample the wastewater and submit the additional analyses to the Department. If any of the Total Nitrogen concentrations exceeds 125% of the design value over a three-month period, the Permittee shall have the system evaluated to determine the cause and submit a revised Design Engineer Report to the Department. If the effluent exceeds 150% of the design value [Design Value +50%], the Department may invoke the provisions of Part VI.A.1 of this Permit. Also reference Part V.A.3.

Effluent Nitrogen Concentration				
Phase	Effluent Nitrogen Concentration Limit (mg/L)	Blended Effluent Nitrogen Concentration Limit (mg/L)	Design Value + 25%	Design Value +50%
Phase 2	10.0	22.5	28.1	33.8
Phase 3	10.0	17.9	22.4	26.9

11. Total Phosphorus

    Total Phosphorus concentration shall not exceed 8 mg/L.

12. BOD_5

    The 5-day Biochemical Oxygen Demand (BOD_5) daily average concentration shall not exceed 10 mg/L calculated as the summation of all daily BOD_5 monitoring result concentrations obtained divided by the number of days when the measurements were made during the calendar month.

13. Fecal Coliform

    The Fecal coliform bacteria daily average concentration shall not exceed 20 col/100 mL.

14. TSS

    The Total Suspended Solids (TSS) daily average concentration shall not exceed 10 mg/L calculated as the summation of all daily BOD5 monitoring result concentrations obtained divided by the number of days when the measurements were made during the calendar month.

15. Turbidity

    The Turbidity daily average concentrations shall not exceed 5 NTU calculated as the summation of all daily BOD5 monitoring result concentrations obtained divided by the number of days when the measurements were made during the calendar month.

16. pH

    The pH of the effluent shall not be less than 5.5 standard units nor greater than 9.0 standard units at any time.

17. TRC

    The Total Residual Chlorine shall not be less than 1.0 mg/L and shall not exceed 4.0 mg/L at any time.

18. Chloride

    The Chloride concentration of the effluent shall not exceed 250 mg/L on a rolling annual average basis.

19. Sodium

    The Sodium concentration of the effluent shall not exceed 210 mg/L on a rolling annual average basis.

20. Debris, sludge deposits, scum, fats oil and grease

The discharge to the spray irrigation fields shall be free from material such as floating solids, sludge deposits, debris, scum, oil and grease.

21. Summary Table of Effluent Concentration Limits:

Parameter	Limit and Point of Compliance		Units	Basis
	SRRF Treatment System	Irrigation		
Total Nitrogen	10	Phase 2 22.5 Phase 3 17.9	mg/L	Daily Average
Total Phosphorus	8	8	mg/L	Daily Average
BOD_5	10	N/A	mg/L	Daily Average
Fecal Coliform	20	20	colonies/100mL	Daily Average
Total Suspended Solids	10	N/A	mg/L	Daily Average
Turbidity	5	N/A	NTU	Daily Average
pH	>5.5 AND < 9.0	>5.5 AND < 9.0	SU	Daily Min/Max
Total Residual Chlorine	N/A	N/A	mg/L	Daily Min
Chloride	250	250	mg/L	Rolling Annual Average
Sodium	210	210	mg/L	Rolling Annual Average

Public Access Criteria

22. The facility is designed for Unlimited Public Access criteria.

Effluent Loading Limitations

23. Nitrogen Loading Limitation

The total amount of nitrogen that may be applied to each spray field acre shall not exceed the following limitations. This amount includes supplemental fertilizers (when authorized by the Department), the nitrogen supplied from the effluent, and any other source. [Taken from May 3, 2023 revised Nitrogen Balances for Sussex Regional Recharge Facility (SRRF) Phase 1 and Phase 2.] The Phase 2 limits shall also apply to Phase 3 operations. Additional Nitrogen via fertilizer in excess of the below limits may only be applied if approval is received from the Department in accordance with the Schedule of Compliance in Part IV.A.2.a of this Permit.

Nitrogen Loading Limits (lbs/acre-year)		
Crop Type	Phase 2	Phase 3
Cover-Corn-Wheat	352.5	352.5
Wheat-Soybean-Cover	417.7	417.7
Woods (Loblolly Pines)	421.9	421.9

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 limitation.

If any crops are not removed from the spray irrigation fields, then the Total Nitrogen application rate for the field shall be reduced by the amount of nitrogen that would be removed by harvesting the crop as detailed in SRRF's May 3, 2023 Design Nitrogen Balances.

24. Phosphorus Loading Limitation

The total amount of Phosphorus that may be applied to the crop areas in Fields D, F, and G shall not exceed crop uptake needs of 31.2 lbs/acre per year. This amount includes supplemental fertilizers (when approved by the Department), the phosphorus supplied from the effluent, and any other source. The wooded areas in Fields D and G, as well as all of Field E, do not have high phosphorus, and are thus exempt from these criteria. [February 2021 SRRF Phase 2 Design Engineer Report, Appendix C.2]

Adjustments and reductions are not to be factored into the annual reporting of Total Phosphorus Loading for demonstration of compliance with this limitation.

If any crops are not removed from the spray irrigation fields, then the Total Phosphorus application rate for the field shall be reduced by the amount of phosphorus that would be removed by harvesting the crop.

Effluent Contingency Plans

25. Spray Irrigated Effluent from the Storage Lagoon - Fecal Coliform Bacteria - Contingency Plan

    a. If the analytical results of an effluent sample from discharge side of the SRRF irrigation pumps documents an exceedance of the maximum limitations for fecal coliform bacteria set by this Permit, the Permittee shall collect and analyze a second sample within 24 hours after becoming aware of the exceedance. If the second sample documents that the maximum limitation for fecal coliform bacteria is continuing to be exceeded, the following corrective actions shall be enacted:

        i. Notify the Department of the non-compliance.

        ii. Immediately cease discharging effluent.

        iii. Submit copies of the recent analytical results documenting the two exceedances to the Department.

        iv. Examine operation and maintenance logs for improper operational procedures.

        v. Conduct a physical inspection of the treatment system, lagoon, and effluent transfer line to detect abnormalities. Any abnormalities discovered shall be corrected.

    b. Within 24 hours of enacting these corrective actions, the Permittee shall collect and analyze a third sample for fecal coliform bacteria from discharge side of the SRRF irrigation pumps. If the analytical results no longer document an exceedance of the maximum limitations for fecal coliform bacteria, the Permittee shall notify the Department and may resume normal operations.

    c. However, if the analytical results of the third sample again documents an exceedance of the maximum limitations for fecal coliform bacteria set by this Permit, the Permittee shall install and operate a temporary disinfection system to further treat the effluent from the lagoon. Disinfection shall continue until fecal coliform bacteria results meet required limits and the Department authorizes the Permittee to cease disinfection.

26. SRRF Treatment System Effluent - Fecal Coliform Bacteria and Turbidity - Contingency Plan

    a. If the analytical results of a treated wastewater sample collected from the sampling port located immediately after filtration and disinfection documents an exceedance of the maximum limitations for fecal coliform bacteria and/or turbidity set by this Permit, the Permittee shall collect and analyze a second sample within 24 hours after becoming aware of the exceedance. If the second sample documents that any maximum limitation for fecal coliform bacteria and/or turbidity is continuing to be exceeded, the following corrective actions shall be enacted:

        i. Notify the Department of the non-compliance.

        ii. Submit copies of the recent analytical results documenting the exceedance to the Department.

        iii. Immediately increase filtration through the cloth media filters. This shall be accomplished by either bringing online additional filtration capacity or decreasing the loading per square foot of filter media.

        iv. Examine operation and maintenance logs for improper operational procedures.

        v. Conduct a physical inspection of the treatment system to detect abnormalities. Any abnormalities discovered shall be corrected.

b. Within 24 hours of enacting these corrective actions the Permittee shall collect and analyze a third sample for fecal coliform bacteria and/or turbidity from the treatment system discharge. If the analytical results no longer document an exceedance of any of the maximum limitations for fecal coliform bacteria and/or turbidity, the Permittee shall notify the Department and may resume normal operations.

c. However, if the analytical results of the third sample again documents an exceedance of any of the maximum limitations for fecal coliform bacteria and/or turbidity set by this Permit, the following corrective actions shall be enacted:

   i. Notify the Department of the continued non-compliance.

   ii. Submit copies of the recent analytical results documenting an exceedance to the Department.

   iii. Effluent from the treatment system shall be diverted away from the 90-million- gallon storage lagoon back to the influent equalization/diversion lagoon for further treatment.

   iv. When additional analytical results from samples of treated wastewater effluent no longer document an exceedance of any of the maximum limitations for fecal coliform bacteria and/or turbidity, the Permittee shall notify the Department and upon written approval from the Department may resume transferring treated wastewater to the 90-million-gallon storage lagoon and resume normal operations.

d. If the facility is required to divert wastewater more than three times in a 12- month period for exceeding the maximum limitations for fecal coliform bacteria and/or turbidity set by this Permit, the Permittee shall have the wastewater treatment system evaluated to determine the cause of the elevated fecal coliform bacteria and/or turbidity results and submit a revised Design Engineer Report with proposed corrective actions to achieve a maximum fecal coliform bacteria count of 20 colonies/100 mL and/or turbidity concentration of 5 NTU that bears the seal and signature of a Class C licensed Delaware Professional Engineer to the Department. The report shall be submitted within one year of the third notification of the diversion of wastewater for exceeding the permitted limitations for fecal coliform bacteria and/or turbidity being enacted. The Permittee shall initiate implementation of the plan within 90 days following approval by the Department.

27. SRRF Treatment System Effluent - Total Nitrogen - Contingency Plan

    a. If the analytical results of a treated wastewater sample collected from the sampling port located immediately after filtration and disinfection documents the exceedance of the 10 mg/L Total Nitrogen concentration, the Permittee shall collect and analyze a second sample within 24 hours of becoming aware of the original exceedance. If the second sample results documents that the 10 mg/L Total Nitrogen concentration continues exceeded the Total Nitrogen limitation, the Permittee shall enact the following contingency plan.

        i. The Permittee shall notify the Department within 24-hours after becoming aware of the second exceedance and submit a copy of the analytical results to the Department.

        ii. If laboratory testing confirms that treated wastewater concentrations exceed 10 mg/L but the exceedance is less than 20 mg/L for either Nitrate as Nitrogen or Total Nitrogen than the Permittee shall notify the Department to determine if treated wastewater is required to be diverted for retreatment. If required, the treated wastewater shall be immediately diverted for storage and retreatment.

        iii. If laboratory testing confirms that treated wastewater concentrations exceed 20 mg/L for either Nitrate as Nitrogen or Total Nitrogen than the Permittee shall immediately divert the treated wastewater for storage and retreatment.

        iv. The Permittee shall increase the frequency of Total Nitrogen effluent sampling at the SRRF wastewater treatment system to once daily and submit weekly results to the Department.

        v. The Permittee shall examine the operation and maintenance log, required to be maintained by this Permit, for any possible improper operational procedures.

        vi. The Permittee shall conduct a physical inspection of the treatment system to detect abnormalities. Any abnormalities discovered shall be corrected. A report detailing the corrections made shall be submitted to the Department within 30 days of correction.

        vii. When daily analytical results from three consecutive days of wastewater sampling do not exceed the limitation, the Permittee is authorized to discharge to the storage lagoon and return to a bi-weekly monitoring frequency.

    b. If the Department approves the continued discharge of treated wastewater in accordance with Part II.B.26.a.ii to the storage lagoon, the following additional requirements shall be required.

        i. The Permittee shall increase the frequency of Total Nitrogen effluent sampling at the SRRF wastewater treatment system and at the discharge side of SRRF's irrigation pumps to once daily and submit weekly results to the Department.

        ii. The Permittee shall submit monthly TN balances documenting that the facility can continue spray irrigation at higher concentrations while not exceed 10 mg/L TN (monthly basis) in the percolate.

        iii. When daily analytical results from three consecutive weeks of wastewater sampling do not exceed the limitation, the Permittee is authorized to return to a bi-weekly monitoring frequency.

c. If the facility is required to enact this contingency plan more than three times in a 12-month period, the Permittee shall have the system evaluated to determine the cause of the elevated total nitrogen results and submit a revised Design Engineer Report with proposed corrective actions to achieve a maximum total nitrogen concentration of 10 mg/L that bears the seal and signature of a Class C licensed Delaware Professional Engineer to the Department. The report shall be submitted within one year of the third notification of the contingency plan being enacted. The Permittee shall initiate implementation of the plan within 90 days following approval by the Department.

C. FERTILIZER LIMITATIONS

1. Application of Additional Fertilizer

The application of additional fertilizer is only authorized with Department approval upon the Permittee completing the enhanced, higher resolution monitoring required in the Schedule of Compliance in Part IV.A.2.a through Part IV.A.2.c of this Permit. The enhanced monitoring is required prior to application to ensure groundwater protection by providing accurate actual data to determine via field data if potential groundwater impacts occur due to additional nutrient loading.

a. Upon installation of the enhanced monitoring well network, and the acquisition of required baseline data; the Permittee is authorized to apply nitrogen commercial fertilizers on the spray irrigation fields in a manner that may exceed the limitations contained in the Permit with Department approval.

b. Permittee shall notify the Department within 48 hours of application and submit application data including enhanced monitoring data in the monthly DMR.

c. The Department reserves the right to revoke the authorization of additional fertilizer in the event the enhanced monitoring identifies impacts to groundwater, or the Permittee fails to submit complete and accurate monitoring data.

D. LYSIMETER PERCOLATE LIMITATION

The rolling 12-month average percolate Total Nitrogen concentrations in each lysimeter shall not exceed 10 mg/L. If the rolling 12-month average exceeds the total nitrogen percolate concentration of 10 mg/L, the Permittee shall examine the facility's operation and maintenance log for improper operational procedures, conduct a physical inspection of the disposal system to detect abnormalities, and review monitoring data and other records to determine the cause/source of the total nitrogen exceedance. The Permittee shall report the finding to the Department with any proposed modifications to operational procedures or other corrective actions. The Permittee shall implement proposed actions upon approval by the Department.

Upon the Permittee completing the enhanced, higher resolution monitoring required in the Schedule of Compliance in this Permit, the lysimeter data will be utilized in conjunction with the groundwater monitoring data to determine environmental impact.

PART III

A. MONITORING REQUIREMENTS

Beginning on the effective date and lasting through the expiration date of this Permit, the Permittee shall monitor the facility's operations as specified herein.

1. Allen Harim Harbeson treated effluent entering SRRF's storage lagoon

   The Permittee shall provide sampling results in accordance with the Effluent Monitoring requirements for Allen Harim LLC's Permit No. 597261-01 (or subsequently issued permit).

   Samples may either be taken by AWMI from a sampling port and meter located prior to storage at SRRF or reported as sampled by Allen Harim, LLC at their effluent pump station.

2. Influent Monitoring

   SRRF Treatment System Influent

   The Permittee shall sample influent wastewater to the SRRF treatment system for the following parameters.

Parameter	**Unit of Measurement**	**Monitoring Frequency**	**Sample Type**
Flow - Total Flow for Month	Gallons	Continuous	Recorded
Flow - Max Daily Flow	Gallons	Continuous	Recorded
Flow - Average Daily Flow	Gallons/Day	Continuous	Calculation[2]
BOD5	mg/L	Twice per Month	Grab
Total Suspended Solids TSS	mg/L	Twice per Month	Grab
Total Nitrogen as Nitrogen	mg/L	Twice per Month	Grab
Ammonia Nitrogen as Nitrogen	mg/L	Monthly	Grab
Nitrate + Nitrite as Nitrogen	mg/L	Monthly	Grab
pH	S.U.	Three times per Week	Grab
Total Phosphorus	mg/L	Monthly	Grab
Chloride	mg/L	Monthly	Grab

[2] Average Daily Flow shall be calculated as Total Influent Flow for Month / Number of Days in Month.

3. Effluent Monitoring

SRRF Treatment System Effluent

The Permittee shall sample effluent wastewater for the following parameters.

Two points of compliance:

Samples taken in compliance with the sprayed effluent monitoring requirements for all parameters specified shall be taken from the following two points of compliance:

a. Wastewater Treatment System effluent sampling shall be taken from a sampling port and meters located immediately after filtration and disinfection.

b. Post-Storage Discharge of Blended Treated Effluent sampling shall be taken from a sampling port and meters located at the discharge side of the SRRF storage lagoon, irrigation pumps.

Parameter	Unit of Measurement	Monitoring Frequency	Sample Type
Flow - Total Flow for Month	Gallons	Continuous	Recorded
Flow - Max Daily Flow	Gallons	Continuous	Recorded
Flow - Average Daily Flow	Gallons/Day	Continuous	Recorded
BOD5	mg/L	Twice per month	Composite
Total Suspended Solids TSS	mg/L	Twice per month	Composite
Total Nitrogen as Nitrogen	mg/L	Twice per Month	Composite
Ammonia Nitrogen as Nitrogen	mg/L	Monthly	Composite
Nitrate + Nitrite as Nitrogen	mg/L	Monthly	Composite
Organic Nitrogen as Nitrogen	mg/L	Monthly	Calculation
pH	S.U.	Three times per week	In-situ
Total Phosphorus	mg/L	Monthly	Composite
Chloride	mg/L	Monthly	Composite
Fecal Coliform	Col/100 ml	Twice per month	Grab
Turbidity	NTU	Continuous	Recorded
Total Residual Chlorine[3]	mg/L	Continuous	Recorded
Potassium	mg/L	Monthly	Composite
Sodium	mg/L	Monthly	Composite
Cadmium	mg/L	Annually	Composite
Copper	mg/L	Annually	Composite
Lead	mg/L	Annually	Composite
Nickel	mg/L	Annually	Composite
Zinc	mg/L	Annually	Composite
Total Dissolved Solids TDS	mg/L	Monthly	Composite

[3] Total Residual Chlorine shall only be sampled when disinfection is required at SRRF.

4. Spray Loading Rates Monitoring

The following information shall be recorded, calculated and reported monthly for each spray irrigation pivot and zone.

Flows and Loading Rates shall be provided for each zone (wooded areas) and each pivot (agricultural fields). Providing only an overall summary for each field will constitute a violation of this Permit.

Parameter	**Unit Measurement**	**Monitoring Frequency**	**Sample Type**
Total Effluent Flow to all Pivots/Zones combined	Gallons	Monthly	Data
Max Daily Effluent Flow to all Pivots/Zones combined	Gallons	Monthly	Data
Average Daily Effluent to all Pivots/Zones combined	MGD or gpd	Monthly	Calculation[4]
Total Effluent Flow to each Pivot and Zone	Gallons	Monthly	Data
Number of Days Sprayed During the Month to each Pivot and Zone	Days	Monthly	Data
Nitrogen Loading Rate to each Pivot and Zone	lbs/acre	Monthly	Calculation
Cumulative Annual Nitrogen Loading Rate to each Pivot and Zone	lbs/acre	Monthly	Calculation
Phosphorus Loading Rate to each Pivot and Zone	lbs/acre	Monthly	Calculation
Cumulative Annual Phosphorus Loading Rate to each Pivot and Zone	lbs/acre	Monthly	Calculation
Additional Irrigation Water (i.e. potable) to each Pivot and Zone	Total Gallons	Monthly	Recorded/ Calculated
Additional Irrigation Water (i.e. potable) to each Pivot and Zone	Inches/acre	Monthly	Recorded/ Calculated
Fertilizer Nitrogen to each Pivot and Zone	lbs/acre	Monthly	Reported
Fertilizer Phosphorus to each Pivot and Zone	lbs/acre	Monthly	Reported

[4] Average Daily Flow shall be calculated as Total Effluent Flow for Month / Number of Days in Month.

5. Groundwater Monitoring

   a. Fields L, F and G

   The Permittee shall sample the monitoring wells for Fields L, F and G listed in the table below: 'Groundwater Monitoring Wells' for the parameters and at the frequency, listed in the table below 'Groundwater Monitoring Parameters'. Monitoring well locations are depicted on the Site Map found on Page 3 of this Permit.

   [Well info may be found in 2019.07.17 O&M p.32]

   b. Fields D& E:

      i. The permittee shall conduct a background groundwater quality sampling program within six months prior to initiation of disposal activities. The sampling program shall be sufficient to establish representative groundwater quality at each well prior to initiation of disposal activities. A minimum of three samples shall be collected at least one month apart and analyzed prior to the initiation of disposal activities. A summary report which includes all analyses must be submitted to the Department's Groundwater Discharges Section. Analyses must include, at a minimum, the parameters listed in Section 6.8.1.8.

      ii. Upon authorization from the Department to initiate discharge on Fields D and E, monitoring sampling of the Monitoring Wells for Fields D and E listed in the table below: 'Groundwater Monitoring Wells' must be initiated for the parameters and at the frequency, listed in the table below 'Groundwater Monitoring Parameters'..

c. Enhanced Groundwater Monitoring Network

Groundwater samples from the Enhanced Monitoring Network wells, once installed in accordance with the Schedule of Compliance in Part IV.A.2 of this Permit; in addition to the wells listed in the table below 'Included in Enhanced Monitoring Well Network', shall be monitored for the parameters in the below table at the frequency required in the column 'Enhanced Monitoring Network Monitoring Frequency'.

Groundwater Monitoring Wells	
DNREC Well ID	**Local ID**
254881	MW-1L
254882	MW-2L
254883	MW-3L
254884	MW-4L
258642	MW-1D
TBD	MW-2D
258645	MW-3D
258643	MW-4D
258637	MW-1E
258638	MW-2E
258639	MW-3E
258640	MW-4E
258641	MW-5E
258634	MW-1F
258632	MW-2F
258633	MW-3F
258635	MW-4F
258636	MW-5F
258620	MW-1G
258628	MW-2G
258630	MW-3G
258631	MW-4G
258625	MW-5G
258626	MW-6G
258627	MW-7G
258629	MW-8G
258624	MW-9G

Included in Enhanced Monitoring Well Network	
DNREC Well ID	**Local ID**
258633	MW-3F
258635	MW-4F
258636	MW-5F
258626	MW-6G
258627	MW-7G
258629	MW-8G
258624	MW-9G

Groundwater Monitoring Parameters				
Parameter	**Unit Measurement**	**Measurement Frequency**	**Enhanced Monitoring Network Monitoring Frequency**	**Sample Type**
Depth to Water	hundredths of a foot	Monthly	Monthly	Field Test
Ammonia Nitrogen	mg/L	Quarterly	Monthly	Grab
Chloride	mg/L	Quarterly	Monthly	Grab
Dissolved Oxygen	mg/L	Quarterly	Monthly	Field Test
Fecal Coliform	Col/100mL	Quarterly	Monthly	Grab
Nitrate + Nitrite Nitrogen	mg/L	Quarterly	Monthly	Grab
pH	S.U.	Quarterly	Monthly	Field Test
Sodium	mg/L	Quarterly	Monthly	Grab
Specific Conductance	µS/cm	Quarterly	Continuously	Field Test
Temperature	°C	Quarterly	Monthly	Field Test
Total Dissolved Solids	mg/L	Quarterly	Monthly	Grab
Total Coliforms	Col/100mL	Quarterly	Monthly	Grab
Total Nitrogen	mg/L	Quarterly	Monthly	Grab
Total Phosphorus	mg/L	Quarterly	Monthly	Grab
Arsenic	mg/L	Annually	Annually	Grab
Cadmium	mg/L	Annually	Annually	Grab
Chromium	mg/L	Annually	Annually	Grab
Copper	mg/L	Annually	Annually	Grab
Hardness	mg/L	Annually	Annually	Grab
Iron	mg/L	Annually	Annually	Grab
Lead	mg/L	Annually	Annually	Grab
Manganese	mg/L	Annually	Annually	Grab
Mercury	mg/L	Annually	Annually	Grab
Nickel	mg/L	Annually	Annually	Grab
Selenium	mg/L	Annually	Annually	Grab
Sulfate	mg/L	Annually	Annually	Grab
Zinc	mg/L	Annually	Annually	Grab

6. Groundwater Table Elevation Monitoring Requirements

a. Fields F and G

The Permittee shall take monthly water level measurements at each piezometer for Fields F and G listed in the table below: 'Piezometers' from December through April. Locations are depicted on Page 3 of this Permit.

[Well info may be found on 2019.07.17 O&M p.33].

b. Fields D and E

Upon authorization from the Department to initiate discharge on Fields D and E, monitoring of the Piezometers for Fields D and E must be initiated.

Piezometers	
DNREC Well ID	**Local ID**
TBD	PZ-1D
TBD	PZ-2D
TBD	PZ-1E
TBD	PZ-2E
265831	PZ-1F
265838	PZ-1G
265837	PZ-2G
265832	PZ-3G
265836	PZ-4G
265829	PZ-5G
265833	PZ-6G
265830	PZ-7G

c. While performing the monitoring as required by Part III.A.5 and Part III.A.6 of this Permit, if the 'Depth to Water' in any one of the groundwater monitoring or piezometer wells has reached within 3 feet of the ground surface, the Permittee shall be required to collect additional weekly depth to water measurements from the wells with groundwater levels within 3 feet of the ground surface. The Permittee shall notify the Department in writing within 24 hours.

The additional monitoring is necessary to ensure that discharge ceases in areas where the groundwater may reach within 2 feet of the ground surface. The groundwater mound created by the added infiltration shall at no time reach within two (2) feet of the ground surface in any section of the disposal area.

If the 'Depth to Water' in any one of the groundwater monitoring or piezometer wells has reached within 2 feet of the ground surface, the permittee shall cease all distribution of wastewater to the affected area until the groundwater mound recedes to acceptable levels.

The Permittee may discontinue the additional weekly sampling for depth to water in a monitoring or observation well when the groundwater table elevation readings in the well exceeds a 3-foot separation between groundwater and ground surface. The additional groundwater table elevation measurements shall be recorded in the operator's log and reported to the Department in accordance with Part III.C.2 of this Permit.

7. Lysimeter Monitoring

a. Fields F and G

The Permittee shall sample the lysimeters for Fields F and G listed in the table below: 'Lysimeters' monthly for the parameters listed in the table below: 'Lysimeter Monitoring Parameters'. Lysimeter locations are depicted on the Site Map found on Page 3 of this Permit.

The constituents are listed below in highest priority first. If sufficient sample volume is not obtained to test for all parameters listed, the sample shall be tested for as many constituents possible in the following parameter order.

[Well info may be found in 2019.07.17 O&M p.35].

b. Fields D& E:

Upon authorization from the Department to initiate discharge on Fields D and E, monitoring sampling of the Lysimeters for Fields D and E listed in the table below: 'Lysimeters' must be initiated monthly for the parameters listed in the table below: 'Lysimeter Monitoring Parameters'.

Lysimeters	
DNREC Well ID	**Local ID**
TBD	LY-1D
TBD	LY-1E
TBD	LY-2E
265827	LY-1F
265835	LY-1G
265834	LY-2G
265828	LY-3G

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

8. Soil Monitoring

   a. 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 composite sample with approximately 15 to 20 cores (randomly collected by walking in zigzag pattern stopping periodically to remove a core) from each of the depths (0–12 inches and 12–24 inches) is required for every 40 acres of each soil series (Soil Sampling and testing, University of Delaware Cooperative Extension; The Mid-Atlantic Nutrient Management Handbook, 2006). The composite soil sampling shall represent the average conditions in the sampled body of material. The discrete samples that are to be composited shall be collected from the same soil horizon and depth interval.

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

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

   d. 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 and/or by Department staff during renewal review. Reference Part VI.A.4 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
Total Phosphorus (as P_2O_5)	mg/kg	Annually	Soil Composite
Mehlich-3 Phosphorus	mg/kg	Annually	Soil Composite
Potassium	mg/kg	Annually	Soil Composite
Sodium Adsorption Ratio	meq/100g	Annually	Soil Composite
Total Nitrogen	mg/kg	Annually	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[1]	meq/100g	Only if soil pH changes significantly	Soil Composite
Phosphorus Adsorption[2]	meq/100g	Only if soil phosphorus levels become excessive for plant growth	Soil Composite
Percent Base Saturation[1]	%	Only if soil pH changes significantly	Soil Composite

[1]A significant change in soil pH is defined as a change of one or more standard units from the original value established in the Soil Investigation Report.

[2]Excessive levels of soil phosphorus are defined as phosphorus fertility Index Value (FIV) (i.e., Mehlich 3 Phosphorus) ≥ 150 mg/kg by the Delaware Nutrient Management Commission. Soil phosphorus levels must be tested in accordance with the University of Delaware soil testing methods (Gartley, 2002). If the soil monitoring results indicate phosphorus levels become excessive, the Permittee must perform a Phosphorus Site Index (PSI) study and submit the results to the Department within 120 days of completion of annual soil monitoring. If the PSI results indicate a high probability of phosphorus mobility, the Department may require the Permittee to submit a plan to reduce the phosphorus loading rates and increase crop utilization of phosphorus at the site.

9. Vegetation Monitoring

Upon each harvest, a minimum of one composite sample for each pivot is required upon each harvest for each crop type. If a crop rotation is utilized either in alternate years or in the same year, the aforementioned requirement shall be duplicated for each crop type, for each year.

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

10. OPERATIONS MONITORING REQUIREMENTS

Parameter	Unit Measurement	Monitoring Frequency	Sample Type
Supplemental Irrigation with Groundwater	Total Gallons per zone/pivot	Monthly	Recorded/Calculated
Supplemental Irrigation with Groundwater	Inches/acre per zone/pivot	Monthly	Recorded/Calculated
Fertilizer Nitrogen	lbs/acre per zone/pivot	Monthly	Reported
Fertilizer Phosphorus	lbs/acre per zone/pivot	Monthly	Reported

11. Storage Volume Monitoring

Volume shall be monitored in the storage lagoon and reported in depth (ft) and volume (MG) compared to the total depth available in each lagoon in depth(ft) and volume (MG).

In accordance with the 2019 Drawings G-3 and G-4 the Storage Lagoon has a capacity of 92.6 MG prior to entering into the freeboard.

Permittee shall notify the Department in writing within 24 hours if either lagoon depth encroaches into the freeboard reserve. See also Part IV.B.1.h of this Permit.

Parameter	Unit Measurement	Monitoring Frequency	Sample Type
Lagoon Levels	Feet and Gallons	Weekly	Field Test

12. Surface Water Monitoring

Surface Water samples shall be obtained from the six locations as approximately depicted on the Site Map found on Page 3 of this Permit. The surface water sampling locations include Ingram Branch and Sowbridge Branch (East of Reynolds Pond).

The geographic coordinates of the surface water sampling locations are as follows [location info taken from 2019.07.17 O&M p.34].

Local ID	Northings	Eastings
SW-1	88368.84	205871.47
SW-2	88557.43	206493.46
SW-3	88638.01	207393.63
SW-4	90245.11	205198.77
SW-5	90372.08	206230.09
SW-6	90363.90	207758.40

Coordinates are in NAD 1983 Delaware State Plane 0700 Meters.

Surface Water Monitoring results for each monitoring point shall be reported using the established geographic coordinates.

A down gradient sample for a surface water body should be taken first, immediately followed by the up gradient location for the same surface water body. Followed by, the down gradient sample for the next surface water body being taken third, immediately followed by sampling of the up gradient location for this same surface water body. All samples should be taken on the same day.

Surface Water sampling should not occur within 3 days of a measurable rainfall event to ensure that the streams have returned to base flow, groundwater dominant, conditions.

Parameter	Unit Measurement	Measurement Frequency	Sample Type
Ammonia as Nitrogen	mg/L	Quarterly	Grab
BOD5	mg/L	Quarterly	Grab
Chloride	mg/L	Quarterly	Grab
Dissolved Oxygen	mg/L	Quarterly	Field Test
Enterococcus	Col/100mL	Quarterly	Grab
Fecal Coliform	Col/100 ml	Quarterly	Grab
Nitrate + Nitrite as Nitrogen	mg/L	Quarterly	Grab
pH	S.U.	Quarterly	Field Test
Sodium	mg/L	Quarterly	Grab
Specific 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
Total Suspended Solids	mg/L	Quarterly	Grab

B. MONITORING SPECIFICATIONS

1. Compliance Basis Definitions

    a. The daily average concentration shall be determined by the summation of all the measured daily concentrations obtained divided by the number of days during the calendar month when the measurements were made.

    b. The rolling annual average concentration shall be determined by the summation of the twelve most recent measured monthly concentrations obtained from composite samples divided by twelve.

    c. The daily maximum concentration shall be determined as the highest measured concentration during a calendar day, or any twenty-four (24) hor period.

    d. The daily minimum concentration shall be determined as the lowest measured concentration during a calendar day, or any twenty-four (24) hor period.

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

3. Sampling Frequency

    a. Samples required to be taken monthly, twice per month or biweekly, the samples for each monitoring location (i.e. influent, effluent, well, lysimeter, etc.) shall be taken a minimum of 14 days apart.

    b. Samples required to be taken quarterly shall be taken three months apart.

4. 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.

5. 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.

6. Quality Assurance Practices

    The Permittee is required to show the validity and accuracy 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.

7. Data Accuracy

    All monitoring data obtained in accordance with the requirements of this Permit and submitted to the Department shall be accurate. This includes monitoring data obtained and recorded by the Operator, as well as, monitoring data requiring laboratory 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. 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.

C. REPORTING REQUIREMENTS

1. Initiation of Facility Operations Notification

   If this permit is for initial operations following construction, the Permittee shall not initiate operations without written notification from the Department. Once written approval has been provided by the Department, the Permittee shall subsequently notify the Department in writing within 24 hours of the initiation of operations.

2. Monitoring 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 completed reporting period.

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

   Division of Water - CGSS
   Department of Natural Resources and Environmental Control
   89 Kings Hwy
   Dover DE 19901
   DNREC.Groundwater.Reporting@Delaware.gov

   The Department may provide written requirements for the Permittee to submit monitoring data electronically. Upon notification from the Department, the Permittee shall transition (as directed) to the Department's electronic database system. The submission may need to be electronically signed .

3. Lysimeter Rolling 12-Month Average

The Permittee shall maintain a rolling 12-month average of Total Nitrogen percolate concentrations in each lysimeter. The rolling 12-month average shall be calculated by adding the current month's total nitrogen concentration to the previous eleven month's Total Nitrogen concentrations and dividing the sum by the number of samples obtained (i.e., 12 unless sample data was unattainable for any given month). The rolling 12-month average shall be reported to the Department monthly in accordance with Part III.C.2 of this Permit.

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. Monitoring Results

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

6. Daily Average Concentration

The daily average concentration shall be determined by the summation of all the measured daily concentrations obtained from composite or grab samples divided by the number of days during the calendar month when the measurements were made.

7. Annual Report

The Permittee shall submit to the Department an Annual Report summarizing the operations, management, administration and maintenance of the facility for the calendar year. The Annual Report shall be submitted to the Department on or before **February 28th** of each year. The Annual Report shall include:

a. All applicable items in accordance with Section 6.9 of the Regulations.

b. Meter Calibration documentation required by Part V.A.13 of this Permit.

c. Quality Assurance Practices reporting in accordance with Section 6.8.2.4 of the Regulations.

d. Sludge Handling reporting in accordance with Part IV.A.4 of this Permit.

e. Nutrient Loading, Removal and Analysis:

Permittee shall provide a tabulated summary of the nutrient loading, crop removal and nutrient analysis.

i. Loading: In accordance with the intent of the reporting requirements of Section 6.9.1.7, 6.9.1.8 & 6.9.14.1 of the Regulations, the permittee shall tabulate Total Nitrogen and Total Phosphorus monthly Average Concentrations, monthly volumes of wastewater irrigated per field/zone/pivot, and monthly mass loadings pounds per acre per field/zone/pivot. Annual volumes and loadings shall be calculated for each field/zone/pivot. If fertilizer was applied, monthly Total Nitrogen and Total Phosphorus loading applications via fertilizer shall also be tabulated and incorporated into the annual totals. If additional/supplemental water (i.e., groundwater) was irrigated, monthly and

annual loading applications shall also be tabulated as both 'Total Gallons per field/zone/pivot' and 'Inches/acre per field/zone/pivot.'

Permittee shall tabulate annual loadings per field for Total Nitrogen and Total Phosphorus in comparison to the crop type planted for the year and the permit limit for that specific crop type.

ii. Removal: Utilizing the vegetative monitoring lab data analysis required by Part II.A.8 of the Permit, and in accordance with the intent of the reporting requirements of Section 6.9.14.1 and 6.9.14.5 of the Regulations, the permittee shall calculate and tabulate the Nitrogen and Phosphorus removed by the crops in pounds per acre per field/zone/pivot. The tabulated summary shall note the crop type planted for the pivot, the amount of crop harvested, and the amount of nutrients removed (pounds per acre per pivot). Permittee shall provide a comparison of the lab analyzed crop uptake values with the values utilized in the Nitrogen Balance, Vegetative Management Plan and Phosphorus loading limitation calculation. Permittee shall provide an assessment of Phosphorus utilization relative to the permit limit of 31.2 lbs/acre Total Phosphorus. Permittee shall discuss any discrepancies and proposed operational adjustments. Permittee shall provide the lab data sheets from each crop analysis.

iii. Analysis: When providing the Nitrogen Balance calculations in accordance with Section 6.9.14.2 of the Regulations, the permittee shall provide a Nitrogen Balance worksheet for each Field/Zone/Pivot electronically in Excel spreadsheet format.

f. Soils Monitoring

6.9.14.3 Provide soils data lab sheets.

g. Lysimeter Monitoring in accordance with Part II.A.8 of this Permit.

Lysimeter Monitoring - Provide Lysimeter 12 month rolling average data for Total Nitrogen.

If the rolling 12-month average exceeds the total nitrogen percolate concentration of 10 mg/L, discuss steps taken to examine the facility's operation and maintenance log for improper operational procedures, conduct a physical inspection of the disposal system to detect abnormalities, and review monitoring data and other records to determine the cause/source of the total nitrogen exceedance. Report all findings along with any proposed modifications to operational procedures or other corrective actions.

h. Spray Field Applications

Report a tabulated summary of monthly additional/supplemental:

i. Irrigation water in gallons per field/zone/pivot and in inches/acre per field/zone/pivot.

ii. Fertilizer Nitrogen in lbs/acre per field/zone/pivot

iii. Fertilizer Phosphorus in lbs/acre per field/zone/pivot

i. Storage Lagoon Volume

Report a summary of monthly storage lagoon volumes tabulated in comparison to the permitted action level volume. If storage lagoon volumes exceeded the permitted action level volume, discuss steps taken to assess system functionality and any proposed modifications to operational procedures or other corrective actions.

8. 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 shall be reported in writing to the Department's Department 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 VI.A.1 of this permit shall be reported to the Department. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

9. Non-compliance Notification

   The Permittee shall report to the Department orally within 24 hours from the time the Permittee became aware of any noncompliance with this Permit or the Regulations; or became aware of any other situation that may endanger the public health or the environment by contacting the Department at the telephone numbers cited in Part III.C.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 noncompliance:

   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.

   The Permittee shall provide weekly updates until the non-compliance is corrected.

10. Spill Reporting

    In the event of any environmental release of pollutants (i.e. spill), the Permittee shall call the Department's 24-hour Emergency Release Reporting Hotline at (800) 662-8802 and activate their emergency site plan.

    Within 24-hours from the time the Permittee becomes aware of the release, the Permittee shall also notify the Department via email at DNREC_DOW_Compliance@delaware.gov

    Within five days, the Permittee shall report the following information in writing to the Department via email at DNREC_DOW_Compliance@delaware.gov or at the address cited in Part III.C.2 of this Permit.

    a. The facility name and location of release;
    b. The chemical name or identity of any substance involved in the release;
    c. An indication of whether the substance is an extremely hazardous substance;
    d. An estimate of the quantity of any such substance that was released into the environment;

e. The time and duration of the release;

f. The medium or media into which the release occurred;

g. Any known or anticipated acute or chronic health risks associated with the emergency and, where appropriate, advice regarding medical attention necessary for exposed individuals;

h. Proper precautions to take as a result of the release, including evacuation;

i. The names and telephone number of the person or persons to be contacted for further information; and

j. Such other information as the Department may require.

11. 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

c. Immediately after the Permittee becomes aware of relevant facts omitted from, or incorrect information submitted in, a permit application or report to the Department.

PART IV

A. FACILITY SPECIFIC OPERATIONAL REQUIREMENTS

1. Facility Classification

   A classification was performed on the permitted facility, SRRF, in accordance with the Regulations Licensing Operators of Wastewater Facilities. The SRRF is designated as a Class IV Facility. The SRRF 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 system is in operation.

2. Schedule of Compliance

   The Permittee shall submit the information necessary and/or complete the following requirements for proper compliant operation of the On-site Wastewater Disposal System:

   a. Enhanced Monitoring Plan

      i. Prior to applying nitrogen fertilizers (as discussed in Part.I.D.12), the Permittee shall provide to the Department for review and approval an Enhanced Monitoring Plan for Fields F and G developed by a licensed PG.

      ii. The Enhanced Monitoring Plan shall include, but not be limited to, the following:

         1) The installation of additional groundwater monitoring wells at deeper depths both in-field and down-gradient.

         2) Additional down-gradient wells to be located in between existing wells.

         3) Specific conductivity probes installed in the in-field and down-gradient monitoring wells.

         4) May through October increase monitoring frequency to monthly at a minimum.

         5) Additional Reporting regarding fertilizer, timing of application, type of application, constituents of fertilizer, etc.

         6) Obtain probe baseline data prior to application of additional fertilizer (~6 months of data)

   b. Enhanced Monitoring Well Network Requirements

      i. Within 15 days of installation of the monitoring well network, the Permittee shall provide an updated Monitoring Well As-built Drawing for the entire site bearing the seal and signature of a licensed Professional Engineer registered in the State of Delaware. The Monitoring Well As-built Drawing shall contain:

         1) Table summary of groundwater monitoring well information.

         2) GPS information detailing the northings and eastings; the local well ID number; and the DNREC Well ID/Well Permit Number. The GPS information must be in either Delaware State Plane, North American Datum 1983 meters; or Latitude and Longitude decimal degrees.

         3) TOC elevations survey results, using NAVD88, for all monitoring wells to be utilized for groundwater monitoring. Provide the length of the well stickup and the well survey information to the closest 0.01 feet. Provide a permanent mark, etch,

or fixture to be used to specify the survey point where the TOC elevations were read.

c. Enhanced Monitoring Contingency Plan

i. Within 15 days of installation of the monitoring well network, the Permittee shall provide an Enhanced Monitoring Contingency Plan that shall, at a minimum, address a potential event of elevated Nitrates, or upward trend, being detected in the in-field or downgradient wells. The plan shall include multiple short- and long-term mitigation measures (e.g., field resting, crop rotation, or other source control measures and/or hydrogeologic investigation and corrective actions).

d. Prior to utilizing Fields D and E, the Permittee shall complete the following:

i. The Permittee shall notify the Department in writing of the intent to initiate construction activities for Fields D and E at least fifteen days prior to the commencement of construction. The written notification shall include a draft construction schedule. The Permittee shall provide updated construction schedules if the schedule changes as construction progresses.

ii. The Permittee shall notify the Department in writing upon completion of construction and request a Construction Completion Inspection to be performed by the Department staff. If an inspection is required, the Design Engineer, Class E.4 system contractor, licensed operator, and the Permittee may be required to be present during the inspection. During the inspection, all mechanical parts are to be tested.

iii. Upon completion of construction, the Permittee shall submit to the Department the following applicable items. The items shall be combined in one package and shall include an electronic copy of all items where possible. Failure to submit all required information constitutes grounds for denial of the authorization to utilize Fields D and E for disposal.

1) Design Engineer Inspection Report(s) certifying the project has been constructed in accordance with approved plans and specifications.

2) Copies of any other applicable State/County inspection reports.

3) Contractor's Certificate of Completion.

4) A set of "as-built" drawings of the project bearing the seal and signature of a licensed Professional Engineer registered in the State of Delaware.

a) The "as-built" drawings shall include:

b) Site map showing the location of all structures, piping and appurtenances, disposal areas and buffers.

c) A full equipment list and technical specifications for all equipment used, if different than submitted in the permit application.

d) The new topography elevations of the system.

e) Monitoring/Observation well elevations at the top of the casing (TOC) and at the ground surface, GPS coordinates (State Plane), and local topography tied to a common benchmark.

f) The location and screen depth, length of stick up, and well IDs shall be provided for each monitor well.

5) Any necessary updates to the Operation and Maintenance (O&M) Plan in accordance with Section 6.7 of the Regulations.

6) Spreadsheet summary of groundwater monitoring well, lysimeter, and piezometer information.

7) GPS information detailing the northings and eastings; the local well ID number; and the DNREC Well ID/Well Permit Number. The GPS information shall be in either Delaware State Plane, North American Datum 1983 meters, or Latitude and Longitude decimal degrees.

8) TOC elevations survey results for all monitoring wells to be utilized for groundwater monitoring. Provide the length of the well stickup and the well survey information to the closest 0.01 feet. Provide a permanent mark, etch, or fixture to be used to specify the survey point where the TOC elevations were read.

9) A summary report detailing the analyses of the background groundwater quality sampling program that was conducted consisting of at least three (3) samples one (1) month apart and analyzed within six months prior to the initiation of disposal activities (see Section 6.6.3.16 of the Regulations). Lab data sheets must be provided in addition to an Excel summary worksheet.

10) An approved Conditional Use for Field D parcel (2-35-6-11.01).

11) A summary report detailing the analyses of background soils sampling that was conducted in accordance with Part III.A.9 "Soil Monitoring Requirements" of this permit and performed **within six months** prior to the initiation of disposal activities. Lab data sheets must be provided in addition to an Excel summary worksheet.

12) An annual soils monitoring plan for the planned irrigated areas of Fields D and E.

iv. Obtain written approval from the Department authorizing disposal on Fields D and E.

<u>Phase 2</u>

e. Prior to operation of the SRRF wastewater treatment system constructed in accordance with DNREC Construction Permit DEN Number 359288-03, Permittee shall obtain written approval from the Department.

<u>Phase 3</u>

f. Prior to operation of the SRRF wastewater treatment system constructed in accordance with DNREC Construction Permit DEN Number 359288-0*, Permittee shall obtain written approval from the Department.

g. Fields D and E must be brought online before Permittee may operate Phase 3 upgrades

h. Within two years of the issuance of this Permit, the Permittee shall complete and submit to the Department a full site characterization for all spray fields: HSR, SWAR, SIR.

i. Within 3 months of the issuance of this Permit, the Permittee shall update the 2017 VMP to mirror 2023 revised Nitrogen Balances with reduced fertilizer applications. Ensure that the VMP takes into account the upward trending or excess Phosphorus in the soils (if applicable) relative to crop selection. Information submitted with the annual soils monitoring indicates that the Phosphorus is trending upwards despite permit limitations to not apply P fertilizer and P application to maintain below crop uptake values.

3. Buffer Requirements

   Buffer zones shall be maintained in accordance with Section 6.3.2.3.10 of the Regulations unless otherwise specified below.

   a. Buffer zones of at least 150-feet shall be maintained around all public and private domestic wells.

   b. A buffer zone of 150-feet shall be maintained from all downgradient domestic wells occurring on parcels 235-14.00-63.00, 235-14.00-66.00, and 235-13.00-6.00 [Per DNREC Hydrogeologic review dated March 25, 2010 and the August 18, 2017 DDR Addendum].

   c. In accordance with Secretary's Order No. 2012-W-0052 Issued and Effective March 12, 2013, Permittee shall:

      i. Maintain all required buffers for the spray fields as set by both the Department and Sussex County.

      ii. Maintain a 100-foot buffer from the wetted field area to the north-west corner of the Sylvan Acres Development.

4. Sludge Handling Requirements

   The Permittee shall properly manage all solids generated by the treatment system to maintain effective operation by removing solids as necessary in accordance with accepted process control methods. Solids removed from the treatment process shall be contained, transported, and disposed of in accordance with all local, state, and federal regulations. The Permittee shall maintain records of solids disposal.

   Management and disposal of biosolids produced at the SRRF wastewater treatment system shall be handled by pumping and transport to Sussex County's Class A biosolids treatment facility at the Inland Bays Regional Wastewater Treatment Facility. The Permittee owns and operates two (2) 5,000-gallon pumper trucks operating under State of Delaware Non-Hazardous Liquid Waste Transporters Permit (No. DE OH- 300). The Permittee shall use these trucks (or other permitted tricks) to transport biosolids. The Permittee shall handle sludge in accordance with the disposal agreement dated September 19, 2019 with Sussex County Council to dispose of up to 100 dry tons of biosolids per year at their IBRWTF biosolids facility. The Permittee shall maintain a current copy of the executed agreement with Sussex County on file with the Department.

   Records of solids disposal, including the volume of solids removed, and copies of all manifests for the previous calendar year shall be submitted to the Department in the Annual Report.

5. Interconnections

   The Permittee is authorized to transfer flows to other AWMI owned and Sussex County owned wastewater treatment facilities for additional treatment and/or disposal as approved by Department issued Permits.

6. Secretary's Order No. 2012-W-0052

   In accordance with Secretary's Order No. 2012-W-0052 Issued and Effective March 12, 2013, the Permittee shall:

a. Design the treatment plant to look like an agricultural building and have landscaping to screen it from view from its neighbors.

b. Ensure that the storage ponds do not become a breeding ground for mosquitos.

c. Maintain all required buffers for the spray fields as set by both the Department and Sussex County.

i. Maintain a 100-foot buffer from the wetted field area to the north-west corner of the Sylvan Acres Development.

7. Sussex County ordinances and conditional use requirements

The Permittee shall comply with all applicable Sussex County ordinances and conditional use requirements placed on this facility.

8. Land Lease Agreement

The Permittee shall maintain an updated copy of the spray irrigation land area Lease Agreement on file with the Department.

9. Field D Conditional Use

Wastewater spray irrigation will not be permitted on Field D parcel (2-35-6-11.01) until it is added to an approved Conditional Use. Parcel 2-35-6-11.01 is not included in the current Conditional Use Ordinance 1923, adopted July 31, 2007. Once this parcel has been added to an approved Conditional Use, the Permittee shall provide a copy of the approved Conditional Use to the Department for approval.

B. DISCHARGE TYPE SPECIFIC CONDITIONS:

1. Spray Irrigation

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

        1) 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.

        2) 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.

        3) Aerosols or nuisance odors shall not extend beyond the boundary of the spray irrigation site when treated wastewater is being applied. If aerosols are not contained within the site or if odors are produced that are a public nuisance, the Permittee shall take necessary steps to eliminate such aerosol migration and odors. All actions taken shall be reported to the Department.

        4) Erosion controls shall be employed to prevent wastewater runoff from the spray irrigation fields. The Permittee shall notify the Department immediately if any wastewater runoff occurs.

        5) The spray irrigation field's crops shall be maintained in optimal condition, including any necessary weed management, reseeding, or other vegetative management practices.

        6) Effective vegetative management shall be provided such that crops harvested on the spray irrigation sites are removed from the sites within six (6) months of harvest.

        7) Forage crops shall be harvested and removed from the irrigation field(s) at least twice a year. Crops harvested shall be removed from the irrigation site within six (6) months of harvest.

        8) The wastewater shall be applied in a manner such that the application is even and uniform over the irrigation area.

    b. Spray irrigation is prohibited when saturated or frozen soil conditions exist.

    c. 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.

    d. Buffer zones shall be maintained in accordance with Section 6.3.2.3.10 of the Regulations unless otherwise specified below.

    e. The Permittee shall take appropriate measures to protect the spray irrigation system from damage due to sub-freezing conditions.

    f. Signs

1) Limited Public Access: Signs shall be posted on all limited public access spray fields utilized to irrigate treated wastewater to prohibit public contact. The signs shall indicate that the water being irrigated is treated wastewater. The signs shall be legible. Limited public access sites shall have signs posted on the perimeter every 1,000 feet, at a minimum, and at all entry points.

2) Unlimited Public Access: Unlimited public access sites shall 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.

g. Potable ground or surface water may be used for distribution system testing and irrigation to establish vegetation when sufficient treated effluent is not available.

h. Freeboard
   1) At least three feet of freeboard, measured vertically from the lowest point of the berm, is required for all ponds/lagoons. The lowest point of the berm shall be determined and marked.

   2) The Permittee shall notify the Department 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 Department to coordinate relief measures. In the event of an emergency, Permittee may contact the Department at the telephone numbers cited in Part III.C.2 of this permit; however, written notification shall subsequently be provided within 5 days of encroachment.

i. 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 shall analyze the material for nutrients and any other applicable parameters of concern as determined by the Department Prior to tank cleanout being performed. Permittee shall submit to the Department 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 shall 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.

j. The collection and channelization of irrigated wastewater for purposes other than retreatment is prohibited.

k. Direct application of treated wastewater to drainage ditches, any water bodies, and wetlands is prohibited.

PART V

A. OPERATIONAL REQUIREMENTS AND RESPONSIBILITIES

1. Inspection Fee

   The Department will conduct an annual compliance inspection with the facility's operator of the on-site wastewater treatment and disposal system. An inspection fee will be charged.

2. Duty to Comply

   The Permittee shall comply with all the terms and conditions of this Permit.

   The discharge of any pollutant in excess of that identified and authorized herein, shall constitute a violation of the terms and conditions of this Permit..

   The violation of any influent/effluent limitation, or of any other condition specified in this Permit, is a violation of 7 *Del. C*. Chapter 60 and is grounds for enforcement, as provided in 7 *Del. C*. § 6005, "Enforcement; civil and administrative penalties; and expenses." In addition, the Department may seek enforcement including § 6013, "Criminal penalties" and § 6018 "Cease and desist order" for any violations including, but not limited to a) Permit termination or loss of authorization to discharge pursuant to this Permit; b) Permit revocation and reissuance, or Permit modification; or c) denial of a Permit renewal application.

   The Department may seek voluntary compliance by way of warning, notice or other educational means, pursuant to 7 *Del. C*. § 6019 "Voluntary compliance" or any other means authorized by Law. However, the Law does not require that such voluntary means be used before proceeding by way of compulsory enforcement.

3. 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 VI.A.1 of this permit.

4. Department Requests for Additional Information

   The permittee shall furnish to the Department within a specified period of time, any information including copies of records, which may be requested by the Department to determine whether cause exists for modifying, revoking, reissuing, or terminating the permit; or, to determine compliance with the permit and the Regulations, or protect public health.

5. 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 shall be kept under the conditions of the permit.

   c. Inspect any facility/system, equipment, practice, or operation permitted or required by the permit.

   d. Sample or monitor for the purpose of assuring permit compliance of any substance or any parameter at the facility.

6. Groundwater Requirements

   Operation of the wastewater treatment facility and disposal system shall not cause the quality of Delaware's groundwater resources to be in violation of applicable Federal or State Drinking Water Standards. If the Department determines that the discharge is impacting groundwater quality or downgradient receptors, corrective actions will be required.

7. Adverse Impact

   The Permittee shall take all reasonable steps to eliminate or minimize any adverse impact to waters of the State resulting from this Permit, including such accelerated or additional monitoring as necessary to determine the source, nature, and extent of the impact from a noncomplying discharge. In addition, at the direction of the Department, the Permittee shall submit a corrective action plan which will include a description of the proposed actions to mitigate or eliminate the source of the impact and an associated completion schedule. The plan shall be enacted as approved by the Department.

8. Facilities Operation

   The Permittee shall 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.

9. Emergency Repairs

   The Permittee shall perform all necessary emergency repairs to the on-site wastewater treatment and disposal system.

   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 shall be submitted to the Department via email at DNREC_DOW_Compliance@delaware.gov within five (5) days of completion of the emergency repairs. The report shall summarize the nature of the emergency and the repairs performed.

   All violations shall also be reported in accordance with Part III.C.9 of this Permit.

10. Operator Log

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

11. Fencing

    Fencing is required at treatment facilities, pump stations, RIBs and storage/treatment ponds. Fencing of spray fields is not required.

    RIBs must be enclosed by fencing with a minimum height of 42-inches to prevent access to the area by foot or vehicular traffic. Fencing design must be approved by the Department. The entrance to the RIBs must be locked and signs must be posted every 200 feet warning the public that the enclosed area is utilized for the disposal of treated wastewater.

12. Meter Calibration

    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.

13. New or Replacement Wells

    a. Groundwater Monitoring Wells
        1) In the event that the permittee installs new monitoring wells or replaces any existing monitoring wells, the Permittee shall submit to the Department new elevation details relative to the common benchmark previously established.
        2) The Permittee shall submit to the Department the groundwater monitoring well installation details. The installation details shall include each well's Local ID, DNREC Well Permit number; and geographic coordinates as determined in the field using a global positioning system (GPS) and reported in Delaware State Plane, meters, NAD83.
        3) Beginning within a month of install, the permittee shall conduct a groundwater quality sampling analysis consisting of a minimum of three samples collected at least one month apart and analyzed to establish ambient conditions in the new well(s). A summary report detailing all analyses shall be submitted to the Department. Analyses shall include the parameters iterated in Section 6.2.3.5.2 of the Regulations.

    b. Lysimeters

    The Permittee shall submit to the Department the lysimeter installation details. The lysimeter installation details shall include each lysimeter's Local ID, DNREC Well Permit number; and geographic coordinates as determined in the field using a global positioning system (GPS) and reported in Delaware State Plane, meters, NAD83.

14. Operation and Maintenance

    The Permittee shall operate and maintain the on-site wastewater treatment and disposal system in accordance with the facility's Design Engineer Report (DER) and the approved Operation and Maintenance Plan (O&M). A copy of the DER and the O&M shall be kept onsite. The Permittee shall 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 DER or the O&M and the Permit or Regulations, the requirements of the Permit and the Regulations would govern.

15. Bypassing

    The diversion of flow from any portion of the treatment facility's process flow (including, but not limited to, pretreatment, storage, distribution and land 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 Department shall be orally notified within 24 hours after such bypass; and, a written submission regarding the bypass shall 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 shall be submitted to the Department for approval at least ten days prior, or as soon as possible, before the date of bypass.

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

16. 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.

17. 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.

18. Leaks

    All leaks shall be reported to the Department and repaired immediately.

19. Connections

    a. Connections or additions to the on-site wastewater treatment and disposal system other than those indicated on the approved plans are prohibited without prior approval from the Department.

    b. 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 on-site wastewater treatment and disposal system unless the system is designed to receive such flows..

PART VI

A. PERMIT PROVISIONS

1. Permit Revocation

   The Department may revoke a permit if, among other things, the permittee violates any permit condition, the 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. 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 6.5.10.3.1 of the Regulations.

4. Operation Permit Re-Issuance

   At least 180 days before the expiration date of this permit, the Permittee shall submit an application for renewal or notify the Department of the intent to cease discharging by the expiration date.

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.

The application package for systems with a design flow ≥ 100,000 gpd, shall include a five (5) year Compliance Monitoring Report (CMR). The CMR shall be in accordance with Section 6.5.4.3 of Regulations.

If the permittee is required to perform Surface Water monitoring, the CMR Hydrogeologic Report shall include an assessment of the past five years of monitoring date in comparison to background/baseline data.

5. Permit Transferability

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

6. Facility Closure/Abandonment

In the event the facility, or a component of the facility, is proposed to be abandoned, the Permittee shall submit a proposed closure and abandonment work plan with procedures on how the facility will be abandoned for review and approval by the Department. The work plan shall address remediation if monitoring data indicates impacts to the environment. Upon review and approval of the work plan, and completion of all closure and abandonment actions, the permittee must contact the Department for a final inspection of the site.

Permittee shall remain compliant with all permit requirements and Regulations until the Department approves otherwise.

Permittee shall continue performing monitoring well sampling as required by the permit until the Department approves otherwise.

Permittee shall not close or abandon any monitoring wells, nor remove lysimeters, until receiving written authorization from the Department.

7. Federal, State and Local 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.

   This Permit does not relieve the Permittee of complying with any applicable Federal, State, or local regulations. The Permittee shall comply with all Federal, State and local regulations.

8. 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.

9. 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.

10. Revised Regulations

    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.

11. Permit Succession

    This permit supersedes all previous On-Site Wastewater Treatment and Disposal System Operations Permits issued to the Permittee for this facility.