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DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
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OFFICE OF THE SECRETARY

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Secretary's Order No.: 2024-W-0020

RE: Approval of Permit Applications of Sussex County Council for the Phase 2 Upgrade Expansion Project at the Inland Bays Regional Wastewater Treatment Facility ("IBRWTF"), located in Sussex County, Delaware

Date of Issuance: June 13, 2024

Effective Date: June 13, 2024

Under the authority vested in the Secretary of the Department of Natural Resources and Environmental Control ("Department" or "DNREC"), pursuant to 7 *Del.C.* §§6003, 6004, 6006, and all other relevant statutory authority, the Department issues this Order, approving the permit applications of Sussex County Council ("the County" or "Applicant"), for (1) an On-Site Wastewater Treatment and Disposal System ("OWTDS") Construction Permit for a proposed Phase 2 upgrade and expansion project at the County's Inland Bays Regional Wastewater Treatment Facility ("IBRWTF" or "the Facility"); and (2) an OWTDS Operations Renewal and Modification Permit authorizing the operation of the current and future wastewater treatment and disposal systems at the IBRWTF located in Sussex County, Delaware ("Applications," "proposed project").

The above Applications were submitted by the County in accordance with 7 DE Admin. Code 7101, *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* (hereinafter referred to as the "Regulations").

The County currently owns, operates, and maintains the IBWTF for the receipt, treatment and disposal of domestic wastewater for the County's service territories, and, as such, is authorized by the Department as the Permittee of that OWTDS. The Facility consists of headworks with screening and grit removal systems, two Biolac aeration lagoons for biological nutrient removal (BNR), two clarifiers, biosolids handling, dewatering, and storage facilities, a chlorine contact tank for disinfection, and two treated wastewater (effluent) storage lagoons. Presently, up to 2.65 million gallons per day ("MGD") of effluent is discharged to 432.5 acres of agricultural fields via eight center pivot spray irrigation systems. The Facility's current Phase 1 operation is authorized by the County's OWTDS Operations Permit No. 359141-05.

Background, Procedural History and Findings of Fact

The County has now applied for an OWTDS Construction Permit for a Phase 2 upgrade and expansion project at the IBRWTF ("Construction Permit"). The Phase 2 project's scope includes increasing the Facility's wastewater treatment capacity from 2.65 MGD to 4.00 MGD by installing new screening and grit removal systems, constructing two additional Biolac aeration lagoons for BNR, constructing two additional clarifiers, and upgrading/expanding existing pumps, blowers, biosolids, filtration, and irrigation pump systems. The Phase 2 project will also increase the facility's disposal capacity from 2.65 MGD to 6.96 MGD on an annual average basis by adding approximately 347.9 wetted acres on County-owned forested land.

Treated wastewater will be pumped from the IBRWTF effluent storage lagoons and distributed to spray fields with fixed-head sprinkler systems. The distribution system consists of 17,900-ft of 16" PVC C900 distribution lines which feed 186,960-ft of 4" PVC C900 lateral lines that connect to the sprinkler heads. The Phase 2 project is located on the north side of County Road 306, between County Roads 307 and 303, Sussex County, Delaware.

The Phase 2 upgrade and expansion project will also allow the County to distribute treated wastewater to nearby farmers for the irrigation of agricultural crops, in accordance with 3 *Del.C.* §2301 and Section 6.11.8 of 7 DE Admin. Code 7101, *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems*. The County is proposing to distribute treated wastewater to the following parcels:

Owner	Site	Tax Map Number	Zoning
Sussex County	Pelican Point 12.79 Acres	234-16.00-906.00	Open Space Area A1
Hollyville Farms, LLC	Whittington Estates 55.18 Acres	234-21.00-171.00	AR-1-Agricultural / Residential
Avebury LLC Hurdle Property	Avebury Subdivision 25.23 Acres	234-16.00-28.03	SWM Open Areas
Sussex County	14411 Hollyville Rd 209.54	234-16.00-28.00	AR-1-Agricultural / Residential
Sussex County	N/Townsend Rd NE/Harmony Cemetery Rd Parcel A 50.0 Acres	234-16.00-23.00	Exempt
Double H Farm, LLC	24458 Townsend Rd 98.84 Acres	234-16.00-21.01	AR-1-Agricultural / Residential

In addition, the Phase 2 project includes the construction and potential use of a submerged gravel wetland system. The wetland system is a research and demonstration project designed to evaluate the effectiveness of constructed wetlands to serve as an innovative alternative to treated wastewater storage in lagoons, provide an enhanced treated wastewater disposal option, and remediate local groundwater resources. It should be noted that the discharge of treated wastewater to the wetland system will require *separate* Department approval that is not a part of this present Application package currently pending before the Department, and there is no guarantee that the County will be permitted to send effluent to the wetland system or that the wetland system will subsequently be fully permitted for treated wastewater use.

The constructed submerged gravel wetland system, if permitted in the future, would be located on North Burton Field, Parcel Number: 234-22.00-10.00. The distribution of effluent to area farmers and the constructed submerged gravel wetland system do not provide the IBRWTF with additional disposal capacity beyond 6.96 MGD on an annual average basis, but rather, would provide an additional potential alternative disposal outlet, and lagoon storage alternative. The proposed Draft Permits currently pending in this matter only govern the construction of and the potential wastewater discharge to the submerged gravel wetland system.

Along with the OWTDS Construction Permit, the County is also applying to renew and modify their OWTDS Operations Permit for current (Phase 1) operations and to authorize the future use of the new equipment, treatment, and disposal systems installed during the Phase 2 upgrade project. In addition to authorizing increased treatment and disposal capacity, the OWTDS Operations Renewal and Modification Permit ("Operations Permit") will also authorize the discharge of treated wastewater from IBRWTF to rapid infiltration basin systems (RIBs) owned and maintained by Artesian Wastewater Management, Inc., or the County.

The hearing record ("Record") reflects that, following a thorough review of the above described Applications, the Department prepared initial Draft Permits and published Legal Notice in both the *Delaware State News* and the *News Journal* on April 20, 2022, advising the public of the Applicant's above-described proposed project and providing the Draft Permits prepared by the Department. The Legal Notice further stated that a virtual public hearing would be held to consider comments on the proposed project on May 10, 2022. Notice of the public hearing was also placed on the State of Delaware Public Meeting Calendar at that time.

Department staff, representatives of the Applicant, and members of the public attended the public hearing held on May 10, 2022. The public hearing was held virtually on the WebEx platform, resulting in the potential of a greater level of participation by members of the public (when compared historically to in-person attendance at such events).

Comments were received from the public concerning the pending Applications, both at the time of the public hearing and subsequent to the hearing, as the Record remained open for public comment through June 7, 2022. All comments were posted on the DNREC public hearing web page dedicated to this matter upon receipt. Proper notice of the hearing was provided as required by law.

Following the close of the public comment period as noted above, additional information was requested by the Department from the County, in order to fully address all comments and questions received from the public in this matter. The Applicant provided the requested information in a response letter dated October 21, 2022. Thereafter, at the request of Hearing Officer Lisa A. Vest, the Division of Water's experts in the Commercial and Government Services Section ("CGSS") provided a Technical Response Memorandum ("TRM") for the benefit of the Record generated in this matter. The Department's TRM provided not only detailed technical responses to the comments received in this matter, but also offered extensive discussion on the revisions made to the original Draft Permits prepared by the Department in this matter. The Department's TRM, dated March 26, 2024, is discussed in greater detail below.

Subsequent to the receipt of the Department's TRM, Hearing Officer Vest prepared her Hearing Officer's Report ("Report"), dated May 25, 2024. Ms. Vest's Report set forth the procedural history, summarized and established the record of information ("Record") relied on in the Report, and provided findings of fact, reasons, and conclusions that recommend the approval of the Applicant's proposed project currently pending before the Department, subject to the conditions set forth in the final *revised* Draft Permits. The Report, including the Department's TRM (attached thereto as Appendix "A"), is incorporated herein by reference. The Report also addressed the public comments received in this matter in detail and concluded that the same did not warrant the Department's denial of the County's pending Applications, nor the delay of the decision regarding the same to receive any additional information.

Reasons and Conclusions

Currently pending before the Department are the above-described Applications for the County's proposed Phase 2 Upgrade and Expansion Project at the IBRWTF, located in Sussex County, Delaware. As noted previously, the Department has *revised* the original Draft Permits subsequent to the time of the public hearing, necessitated as a result of the questions and concerns raised in the comments received from the public in this matter.

I find that the Applicant is required to obtain both an OWTDS Construction Permit for the proposed Phase 2 Project at the IBRWTF, and an OWTDS Operations Renewal and Modification Permit, authorizing the operation of the current and future wastewater treatment and disposal systems. I further find that above-described Applications are subject to various state and federal regulatory requirements, including, but certainly not limited to, the requirements of Delaware's *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* (7 DE Admin. Code 7101), and as provided for under 7 *Del.C.* Ch. 60.

The Department's TRM provides an exhaustive review of the Applicant's proposed project, in light of the applicable statutes and regulations associated with the Applications and the concerns voiced in the public comments received in this matter. Further, the TRM also discusses various conditions added to the Department's *revised* Draft Permits, pursuant to that review.

During the Department's review of the Record generated in this matter, the subject matter experts in the Division of Water's CGSS grouped the public comments received into areas of concern, and then offered responses to the same. The areas of concern highlighted in this Order were found heavily throughout the public comments received by the Department, and ultimately resulted in the Department *revising* the original Draft Permits to specifically address those concerns.

While the following section references the numerous revisions that have been made by the Department to the initial Draft Permits (along with the reasons for the same), a detailed listing of each of those revisions is contained in a separate section later within this Order. It should be noted that all of the public comments received, as well as the Department's detailed responses to the same, may be viewed in their entirety on the Department's hearing web page dedicated to this permitting matter.

1. Public Health - Potential Contamination Impacting Aquifers/Water Supply

Numerous comments received from the public in this matter expressed concerns for the health of those persons that live in the area of the proposed project, and the potential impact the discharge of treated wastewater (effluent) may have on the local water quality and supply. In response to those concerns, the Department's TRM begins this discussion with the fact that Delaware is dependent on groundwater for a significant portion of its potable water supply. Through its authority under Section 3.13 of the *Regulations*, the Department requires that all permitted OWTDS be "operated and maintained so as not to create a public hazard or cause water pollution." Furthermore, in accordance with Section 3.20 of the *Regulations*, DNREC requires that a Permittee take "all necessary actions to eliminate and correct any adverse impact on public health or the environment resulting from permit non-compliance."

Wastewater is composed of a range of physical, chemical, and biological constituents. The intent of wastewater treatment is to remove regulated constituents of concern for the protection of public health and the environment. The primary constituents of concern in municipal wastewater include total suspended solids ("TSS"), pathogens, biodegradable organics, nutrients (i.e., nitrogen and phosphorus) and other dissolved inorganics, heavy metals, and priority pollutants (i.e., carcinogenic organic and inorganic compounds). Depending on the source of the wastewater (i.e., municipal, industrial, agricultural, etc.) and point of discharge (surface water, groundwater, public or agricultural reuse, etc.), wastewater treatment systems are required to be designed to remove specific levels of applicable constituents to comply with Federal and State water quality standards. Thus, the Department issues discharge permits with treatment limits designed to protect water quality.

To ensure compliance with these regulatory directives, the Department prepared a Draft Construction Permit for the County's proposed Phase 2 upgrade and expansion project at the IBRWTF, and a Draft Operations Permit for the County to incorporate the future operation of the new Phase 2 treatment and disposal systems.

The Draft Permits include effluent limitations along with operational, monitoring, and reporting conditions devised to protect public health and the environment. The existing wastewater treatment facility is designed for and is currently required to meet *limited public access treatment criteria*, which consists of the following:

Parameter	**Daily Permissible Average Concentration**
BOD5	50 mg/L
Fecal Coliform	200 colonies/100 mL
Total Suspended Solids	90 mg/L

In comparison, the Phase 2 upgraded and expanded wastewater treatment facility is designed to meet the State's highest wastewater treatment quality criteria: *unlimited public access criteria*. The treated wastewater utilized for unlimited public access sites will be required to meet the below daily permissible average concentrations. These limitations are listed in Part I.I.12 of the *revised* Draft Operations Permit, as follows:

Parameter	**Daily Permissible Average Concentration**
BOD5	10 mg/L
Fecal Coliform	20 colonies/100 mL
Total Suspended Solids	10 mg/L
Turbidity	5 NTU

Effluent Nitrogen Concentration Limits

Part I.I.2 of the *revised* Draft Operations Permit requires the wastewater treatment system to meet a daily average Total Nitrogen ("TN") concentration (i.e., the sum of all nitrogen forms) of 10 mg/L in the treated effluent prior to disposal or distribution. This limitation applies to both Phase 1 and Phase 2 operations. The federal Maximum Contaminant Level ("MCL") for Nitrate as Nitrogen in drinking water is 10 mg/L. The County's Application indicates effluent will be treated to a TN concentration of 10 mg/L or less prior to disposal. Thus, the design effluent concentration meets the MCL for Nitrate as Nitrogen prior to discharge.

The Facility's wastewater treatment system is designed to ensure that there will be no adverse impact to groundwater resources and local drinking water wells. Additionally, during spray irrigation operations, further nutrient reductions can occur via plant uptake. Part IV.A.2 of the *revised* Draft Operations Permit requires that "[t]he operation of the wastewater treatment facility and spray irrigation system shall not cause the quality of Delaware's groundwater resources to be in violation of applicable Federal or State Drinking Water Standards." The TRM further notes the current system routinely meets a TN of less than 10 mg/L with the 2023 average concentration being 5.9 mg/L.

Effluent Total Phosphorous Concentration Limits

To further address public comments regarding water quality discharged from the IBRWTF, the Department has also included an additional condition (Part I.I.4 of the *revised* Draft Operations Permit) requiring the wastewater treatment system to meet a daily average Total Phosphorous ("TP") concentration of 8.0 mg/L prior to disposal or distribution. This limitation is required for both Phase 1 and Phase 2 operations, in accordance with "Performance Standard Phosphorous Level 2 (PSP2)" of the *Regulations*. Please note the current system routinely meets a TP of less than 8.0 mg/L with the 2023 average concentration being 3.1 mg/L.

Off-Spec Effluent Diversion Requirement

In addition to permit limitations addressing treatment criteria aimed at protecting public health and groundwater resources, both the *Regulations* and the *revised* Draft Operations Permit also require diversion capabilities and contingency plans in the event effluent does not meet the specified criteria. Section 6.3.2.3.2.4 of the *Regulations* stipulates that "[a]utomatic diversion of wastewater that fails to meet the operating criteria must be included in the system design. Furthermore, Section 6.3.2.3.12.3 of the *Regulations* stipulates the following storage requirements for off-spec wastewater:

> *A separate off-line system for storage of reject wastewater must be provided at all unlimited access sites unless another permitted reuse system or effluent disposal system [can receive] the reject wastewater. At a minimum, this capacity must be the volume equal to two days flow at the average daily design flow rate of the treatment facility. Provisions for re-circulating the reject wastewater back to the treatment facility for further treatment may be incorporated into the design of the facility*.

On August 24, 2022, the Division issued a letter seeking clarity regarding the IBRWTF's diversion capabilities and to ensure that the Phase 2 upgraded wastewater treatment system will meet the regulatory requirements outlined above. In a response dated October 21, 2022, the County provided the following IBRWTF Diversion Management Plan:

> *The IBRWTF will have (2) compliance points for validation of effluent quality prior to discharge from the irrigation pumping stations. The filtration facility effluent will have continuous turbidity monitoring and an automated diversion system to distribute flow based on effluent quality.*
>
> *During normal operation, effluent flow within Compliance Point 1 (CP1) limits will be conveyed to irrigation pump station No. 1 which feeds the unlimited public access irrigation loop. If there is a non-compliance condition at CP1, flow will be automatically diverted to effluent storage lagoon No. 2, which feeds irrigation pump station No. 2.*

Compliance Point 2 (CP2) will be located at irrigation pump station No. 2 where flow is pumped to the limited access spray fields. If there is a non-compliance condition at CP2, flow will be diverted back to the aeration distribution box to be re-treated. This configuration is shown on the revised M00.02 schematic.

Contingency Plan Requirements

The *revised* Draft Operations Permit includes detailed Phase 1 and Phase 2 Contingency Plans for exceedances of Fecal Coliform Bacteria, Turbidity, TN, and TP to ensure only high-quality treated wastewater (effluent) is used for irrigation. Further, Part I.I.4 of the *revised* Draft Operations Permit now requires a Phase 1 and Phase 2 Total Phosphorous Contingency Plan. It should be noted that the Total Phosphorous Contingency Plan was added to the *revised* Draft Operations Permit to further address public comments regarding water quality.

While each of these Contingency Plans is uniquely detailed with regard to the specific steps the Permittee must take should any analytical results of a treated wastewater sample indicate exceedances of Fecal Coliform Bacteria, Turbidity, TN, or TP, all such Contingency Plans contain the following identical requirements for action on the part of the Permittee:

If a facility is required to enact the contingency plan more than four times in a 12-month period, the Permittee shall have the system evaluated to determine the cause of the elevated…. concentrations and submit a revised Design Engineer Report with proposed corrective actions….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 fourth notification of the contingency plan being enacted. The Permittee shall initiate implementation of the plan within 90 days following approval by the Department.

Other Effluent Water Quality Limitations

All OWTDS Operations Permits include effluent limitations for Chloride and Sodium, in accordance with Federal water quality guidelines.

The CGSS initially proposed an effluent limitation of 250 mg/L for Chloride and 210 mg/L for Sodium (both on an annual average basis) in the original Draft Operations Permit. To further address public comments regarding concerns for water quality discharged and distributed by the IBRWTF, the Department has now *revised* the Chloride and Sodium effluent limitation conditions from an annual average basis to a rolling 12-month average. The numerical limits of 250 mg/L for Chloride and 210 mg/L for Sodium have not changed.

Specifically, Part I.I.8 of the *revised* Draft Operations Permit now states the following:

> *The Chloride concentration of the effluent shall not exceed 250 mg/L on a rolling 12-month average. The rolling 12-month average shall be calculated by adding the current month's Chloride concentration to the previous eleven (11) month's Chloride 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.*
>
> *If the rolling 12-month average exceeds the maximum Chloride concentration of 250 mg/L, the Permittee shall notify the Department in accordance with this Permit, examine the facility's operation and maintenance log for improper operational procedures, conduct a physical inspection of the treatment and disposal system to detect abnormalities, and review monitoring data and other records to determine the cause/source of the Chloride 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.*

Further, Part I.I.9 of the *revised* Draft Operations Permit now states the following:

> *The Sodium concentration of the effluent shall not exceed 210 mg/L on a on a rolling 12-month average. The rolling 12-month average shall be calculated by adding the current month's Sodium concentration to the previous eleven (11) month's Sodium 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.*

If the rolling 12-month average exceeds the maximum Sodium concentration of 210 mg/L, the Permittee shall notify the Department in accordance with this Permit, examine the facility's operation and maintenance log for improper operational procedures, conduct a physical inspection of the treatment and disposal system to detect abnormalities, and review monitoring data and other records to determine the cause/source of the Sodium 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.

Groundwater Monitoring Permit Requirements

In addition to the incorporation of protective permit limitations for treatment criteria and requirements for diversion and detailed contingency plans in the event effluent does not meet the design criteria, the *revised* Draft Operations Renewal and Modification Permit also includes extensive monitoring requirements to ensure the protection of groundwater resources and public health. To protect the State of Delaware's potable water supply and aquifer, an extensive groundwater monitoring well network is required to be maintained and monitored to ensure any wastewater-related contaminants are promptly detected and quantified. The network is located and designed to provide sufficient early detection of impacts to potential receptors such as nearby potable wells and surface water bodies.

The existing Operations Permit requires a groundwater monitoring well network of 26 wells to ensure that wastewater-related contaminants are detected, quantified, and analyzed regarding their impact to groundwater quality. The *revised* Draft Operations Permit incorporates an expansion of the groundwater monitoring network to include 21 additional monitoring wells (as set forth in Part II.A.3).

Further, the *revised* Draft Operations Permit requires the following parameters to be sampled from the monitoring wells:

Parameter	Unit Measurement	Measurement Frequency	Sample Type
Ammonia as Nitrogen	mg/L	Quarterly	Grab
Arsenic	mg/L	Quarterly	Grab
Chloride	mg/L	Quarterly	Grab
Depth to Water	hundredths of a foot	Monthly	Field Test
Dissolved Oxygen	mg/L	Quarterly	Field Test
Fecal Coliform	Col/100mL	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

Depth to Water ("DTW") monitoring is monthly in the existing Operations Permit. It should be noted that the original Draft Operations Permit erroneously listed DTW as quarterly. The DTW monitoring in the *revised* Draft Operations Permit has been increased to monthly to remain consistent with the existing Operations Permit and to be consistent with the regulatory requirement for monthly groundwater level measurements in observation wells. To further ensure groundwater protection and to address public concerns, the Division has added the following groundwater monitoring parameters to Table 12 of said *revised* Draft Permit:

Parameter	Unit	Measurement	Sample
Cadmium	mg/L	Once per 5	Grab
Chromium	mg/L	Once per 5	Grab
Copper	mg/L	Once per 5	Grab
Hardness	mg/L	Once per 5	Grab
Iron	mg/L	Once per 5	Grab
Lead	mg/L	Once per 5	Grab
Manganese	mg/L	Once per 5	Grab
Mercury	mg/L	Once per 5	Grab
Nickel	mg/L	Once per 5	Grab
Selenium	mg/L	Once per 5	Grab
Sulfate	mg/L	Once per 5	Grab
Zinc	mg/L	Once per 5	Grab

Both the existing and *revised* Draft Operations Permits state that operation of the wastewater treatment system shall not cause the quality of Delaware's groundwater resources to be in violation of applicable Federal or State Drinking Water Standards (see Part IV.A.2 of the *revised* Draft Operations Permit).

Background Groundwater Quality Analysis

In accordance with Section 6.6.3.16 of the *Regulations*, prior to Fields A, B, C and D going into operation, "three separate rounds of groundwater samples will be required to be obtained and tested through a certified laboratory to establish background levels for monitored parameters." The TRM notes that the requirement of background sampling allows the CGSS to ascertain any increasing trends of wastewater constituents in groundwater. Subsequent sampling required to be performed by the Permittee/Applicant via monitoring wells (in-field, up-gradient, and down-gradient) can be compared with the three sets of background data, allowing the Department to assess any impact the spray irrigation activities may have on the groundwater within and adjacent to the spray fields.

It should be noted that the requirement to perform background sampling has been moved from the Draft Operations Permit to the *revised* Draft Construction Permit, to ensure monitoring is performed and submitted with the Construction Completion Package prior to authorization to initiate Phase 2 discharges.

Background Soils Quality Analysis

The background soil samples obtained and tested during the site investigation portion of the project will be utilized to determine any impacts occurring from the spray irrigation activities. Upon the initiation of irrigation activities, annual soil sampling will be required for pH, Organic Matter, Phosphorus, Potassium and Sodium Adsorption Ratio; and, once every five years, heavy metals (Arsenic, Cadmium, Nickel, Lead, Zinc, and Copper) are required to be sampled, in accordance with Part II.A.6 of the *revised* Draft Operations Permit.

Data Assessment and Compliance

The Department's CGSS inspection and compliance team, including experts in wastewater treatment operations, soils, and hydrogeology (Delaware-licensed Professional Geologists), will evaluate monitoring data. These data assessments and evaluations are performed during the review of monthly Discharge Monitoring Reports (DMRs) and routine facility inspections. Any violations or other concerns will be addressed through various compliance and enforcement activities, which may include the issuance of Notices of Violation and Administrative Orders, as appropriate.

Compliance Monitoring Report

In addition to routine compliance evaluations performed by Department staff, Part V.A.3 of the *revised* Draft Operations Renewal and Modification Permit requires the Permittee to prepare a Compliance Monitoring Report (CMR) every five years, in accordance with Section 6.5.4.3 of the *Regulations*. The Permittee will be required to have a Delaware-licensed Professional Geologist prepare a hydrogeologic assessment that includes an evaluation and comparison of temporal trends in both effluent and groundwater quality in comparison to background samples and/or previous sampling results. And, where applicable, the groundwater data will be evaluated with respect to drinking water standards established by the U.S. Environmental Protection Agency ("EPA"). Furthermore, the hydrogeologic assessment will provide a conclusion of the operating status of the wastewater treatment and disposal system based on the monitoring/performance data, and will also provide any recommendations for future monitoring, system upgrades, or improvements.

Remedy

If trends of increasing concentrations and/or impacts are observed, the Permittee will be required to take all necessary actions to eliminate and correct any adverse impact on public health or the environment resulting from Permit non-compliance, in accordance with Section 3.20 of the *Regulations*.

In light of the above, the Department's TRM states that the permitted effluent limitations and monitoring requirements outlined in the *revised* Draft Operations Permit for the IBRWTF, coupled with the design diversion capabilities, detailed contingency plans, and routine inspections and data assessments, are protective of public health and the environment, including (but not limited to) the protection of the local drinking water supply and aquifer.

2. <u>Nitrogen Loading/TMDLs and the need for an Annual Nitrogen Application Limit</u>

Some of the public comment received by the Department expressed concern that the original Draft Operations Permit for the IBRWTF should be revised to (1) include a total annual nitrogen application limit for each spray field acre based on the Total Maximum Daily Loads ("TMDLs") for the affected waterways; and (2) show a reduced application rate for the proposed fields A, B, C, and D. Further concerns were expressed relative to the timing of application based on design calculations.

In response, the TRM notes that 7 DE Admin. Code 7407, *TMDLs for Nutrients for the Indian River, Indian River Bay and the Rehoboth Bay*, Section 2.0, Article 8, states:

> *Implementation of this TMDL Regulation shall be achieved through development and implementation of a Pollution Control Strategy. The strategy will be developed by DNREC in concert with the Department's ongoing Whole Basin Management Program and the affected public*."

Further, 7 DE Admin. Code 7403, *Regulations Governing the Pollution Control Strategy for the Indian River, Indian River Bay, Rehoboth Bay, and Little Assawoman Bay Watersheds*, notes that the Pollution Control Strategies set forth therein were developed "[i]n order to achieve the Total Maximum Daily Loads (TMDLs), determined through vigorous research and modeling." Specifically, Section 8 of 7 DE Admin. Code 7403 addresses the requirements for On-Site Wastewater Treatment and Disposal System Performance Standards as follows:

8.2 Requirements for large OWTDSs having flows greater than 20,000 gallons per day ("gpd"):

8.2.1: All new systems shall meet Performance Standard Nitrogen level 1 (PSN1).

8.2.2: All replacement systems shall meet Performance Standard Nitrogen level 2 (PSN2).

8.2.3: When operations and maintenance permits expire for an existing system, the Department will require the system to meet Performance Standard Nitrogen level 2 (PSN2). If the Department deems that the OWTDS must be redesigned to meet PSN2, the owner or operator of the system will have up to 60 months from the permit expiration date to bring the OWTDS into compliance with the new standard.

The above performance standards are incorporated into the *Regulations* (7 DE Admin. Code 7101), and are summarized in Exhibit-MM therein. Furthermore, Section 6.3.2.3.4.2 of the *Regulations* states that "[s]pray irrigation systems must be designed to ensure the performance standards are adhered to as outlined in Exhibit MM."

In pertinent part, Section 2 of Exhibit MM sets forth the following requirements for Large On-Site Wastewater Treatment and Disposal Systems ("LOWTDS"):

2. Requirements for LOWTDS having flows ≥ 20,000 gpd:

a. All new systems shall meet Performance Standard Nitrogen level 1 (PSN1) and Performance Standard Phosphorus level 1(PSP1).

b. All replacement systems within 1000 feet of the Chesapeake Bay tidal waters (as displayed on Exhibit NN) shall meet Performance Standard Nitrogen level 2 (PSN2).

c. When the operation permit expires for an existing system, the Department will require the system to meet Performance Standard Nitrogen level 2 (PSN2). If the system must be redesigned to meet PSN2, the owner or operator of the system will have up to 60 months from the permit expiration date to bring the system into compliance with the new standard. ***NOTE****: Systems permitted at a higher performance standard will remain at that higher performance standard.*

Accordingly, as noted in the Department's TRM, the proposed project would be required to meet PSN2. The Applicant's project has been designed to meet an effluent of <10mg/L TN. It should be noted, however, that even without the proposed upgrades designed to enhance wastewater treatment, the 2023 annual average for TN was 5.87 mg/L at this facility. This level of treatment satisfies the performance standard set forth in the above-referenced regulatory requirements and the Safe Drinking Water Act's ("SDWA's") Maximum Contaminant Level ("MCL"), thereby assuring the protection of public health.

Furthermore, the Department recognizes that the Inland Bays Watershed is of "Exceptional Recreational and Ecological Significance" and thus has added another condition (*see* Part II.B.6) to the *revised* Draft Operations Permit, requiring an Annual Nutrient Loading Report as a supplement to the Facility's Annual Report. The Annual Nutrient Loading Report will require the Permittee to calculate the monthly and total annual loading and offsets (e.g., septic connections, stormwater best management practices ("BMPs"), biosolids removal, etc.) for TN and TP for all permitted discharge locations.

In addition to the above conditions, the *revised* Draft Operations Permit will also require that, within four (4) years of the Permit's effective date, the Permittee must submit a 10-year sanitary buildout and loading and offset analysis to characterize the potential nutrient (i.e., TN and TP) impacts of the Facility on the Inland Bays Watershed (consisting of Indian River, Indian River Bay, Rehoboth Bay, and their tributaries). Loading and offset data can then be assessed at permit renewal to determine if any permit conditions to address nutrient loads are warranted.

3. <u>Forest Stewardship Plan (FSP) for the proposed wooded irrigation fields</u>.

The Department received public comment expressing concern that there was not a Forestry Stewardship Plan ("FSP") for the proposed wooded irrigation areas, Fields A, B, C and D. In response, the Department sought additional information from the Applicant in a letter dated August 24, 2022, to address this concern.

In part, the letter requested a FSP for the proposed wooded irrigation fields: Fields A, B, C and D. In a response dated October 21, 2022, Sussex County Council provided a Draft FSP to the CGSS, and noted that it was currently under review by the Delaware Department of Agriculture ("DDA"). The Draft FSP for Fields A, B, C and D is attached to the Department's TRM as Appendix III.

It should be noted that the *revised* Draft Operations Permit now includes a requirement for Sussex County Council to provide a modified FSP for Fields A, B, C and D that includes information relative to the nutrient uptake. The *revised* Permit condition (*see* Part I.F) will require the Permittee to have the FSP reviewed by the DDA and executed by both parties. Further, the *revised* Permit will require Sussex County to maintain a current copy of the finalized FSP on file with the Department in the event it is revised, and to operate in accordance with same.

4. <u>Spray Field Maintenance</u>

Additional public comment expressed concern with the Applicant's spray field operations and maintenance and stated that the County was spraying effluent wastewater at the IBRWTF on barren fields, fields with weeds and fields with poor crop density. Other comments noted concern regarding extensive erosion, lack of effective vegetative management, wastewater not being applied uniformly, poor crop density and wastewater being sprayed on saturated fields. Further concerns expressed that there is no contingency plan for when multiple spray fields become compromised, saturated, flooded, frozen, or barren. Lastly, concerns were voiced that spraying wastewater effluent on compromised fields, is strictly prohibited, and doing so fails to protect public health and the environment.

In response to the above concerns regarding the Applicant's spray field maintenance, the Department's TRM refers to Part IV.A.5.b of the *revised* Draft Operations Permit, which requires the following:

> *[T]he 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, the Permit states that spraying on those areas shall be prohibited until saturated conditions no longer exist*.

In addition, Part IV.A.6 of the *revised* Draft Permit prohibits spray irrigation when saturated or frozen soil conditions exist.

In a further effort to address public concerns in this area, the CGSS sought additional information from the County in a letter dated August 24, 2022. Specifically, the CGSS requested an additional Contingency Plan to address effluent flow management and spray irrigation field maintenance during periods of compromised crop growth/density, flooding, or freezing, in accordance with Section 6.3.2.3.13.7 of the *Regulations*. The request further specified that the Contingency Plan must (1) demonstrate preparedness in case the wastewater treatment facility experiences a significant natural occurrence; (2) address, but not be limited to, extended periods of excessive precipitation, and extended periods of subfreezing temperatures causing prolonged periods of frozen soil conditions; and (3) delineate the County's available options to reduce, eliminate and/or prevent non-compliant conditions.

In a response dated October 21, 2022, the County provided the following:

> *Effluent discharge from the IBRWF is mainly impacted by excessive precipitation and sub-freezing temperatures but impact has historically been limited during periods when the fields have low crop density. To address the risk of low crop density (preventing discharge onto barren ground), the County will convert the limited public access spray fields to meadow, which will provide a permanent crop and ground cover. Discharge to the unlimited access wooded spray areas will be always available except during periods of excessive precipitation and sub-freezing temperatures.*

In addition to these wooded spray areas, the proposed disposal scheme will incorporate connections to RIBs & constructed wetlands. The RIBs and constructed wetlands may remain available even during periods of excessive precipitation and sub-freezing temperatures. The diversified disposal options will enable the County to maintain a seasonally varying reserve storage capacity in the storage lagoons equivalent to the effluent generated during design weather events based on historic maximums.

For example, the County will utilize the RIBs, constructed wetland, wooded spray areas, and limited access spray fields in the winter months to maintain a level in the storage lagoons that leaves capacity to store 7 days' flow, the period corresponding to the largest number of consecutive days with sub-freezing maximum temperatures recorded in the last 10 years. Flow that cannot be discharged during a sub-freezing weather event will be stored in the lagoons for discharge when weather conditions permit.

As the County intends to utilize alternative planting methodologies to address instances of compromised crop growth/density, an additional condition (*see* Part I.E) will be included in the *revised* Draft Operations Permit to allow for alternative vegetative coverage with Division approval. The condition states:

VEGETATIVE MANAGEMENT PLAN - PHASE 1 FIELDS

The spray irrigation fields shall be maintained in accordance with the design Vegetative Management Plan (VMP) and Nitrogen Balances provided in the October 2020 Design Engineer Report; or subsequent Vegetative Management Plans as approved by the Department.

Alternative vegetative coverage may be permitted with written Department approval to address instances of compromised crop growth/density or change in vegetation. Requests shall be submitted to the Department for review and approval; and shall include an update to all applicable items of the VMP in accordance with Section 6.5.1.4.1.7.6.8 of the Regulations.

5. <u>Biosolids Management</u>

Public comment expressed concerns related to the management of biosolids at IBRWTF. In effort to address those concerns, the Department sought additional information from the Applicant in a letter dated August 24, 2022. The letter requested that Sussex County Council provide a Biosolids Management Plan, including all applicable permits.

In a response dated October 21, 2022, Sussex County Council provided that:

> *The Inland Bays Biosolids PDR* [Project Development Report] *was submitted to DNREC October 2021 and contains operational information on the existing biosolids facilities. The Inland Bays applicable biosolids permits are as follows:*
>
> - *DNREC Distribution & Marketing, State No. DM 2102-S-03*
> - *DNREC Class B Land Appl., State No. AGU 2005-S-03*

The TRM notes that Class B biosolids are not authorized to be land applied onto either Phase 1 or Phase 2 permitted spray fields. To memorialize this understanding, the sludge handling condition (*see* Part I.K) has been revised. Part I.K.2 of the *revised* Draft Operations Permit now prohibits the land application of Class B biosolids to the spray disposal fields and agricultural distribution spray fields (unless authorized by the Department). The land application of Class A biosolids is authorized, provided biosolid application is reported, in accordance with the fertilizer requirements of the *revised* Draft Operations Permit (*see* Part II.A.8a). Furthermore, the *revised* Draft Operations Permit also provides that:

> [T]*he Department reserves the right to revoke the authorization of fertilizer application if monitoring identifies impacts to groundwater, or the Permittee fails to submit complete and accurate monitoring data*.

6. Tax Map Parcel ID's

Comments were received expressing concern with the stated Tax Map Parcel ID numbers to be used for a portion of the proposed project as listed in the County's Application in this matter. Specifically, commenters noted that (1) Parcel 2-34-22-14 is not a legitimate Parcel ID; (2) Parcel 234-16.00-906.00 is a legitimate Parcel ID but is not located on the county mapping application; (3) the applications note all parcels are on County-owned forested land, however, none of the three remaining parcels are forested; and (4) Parcel 234-21.00-171.00 is owned by Hollyville Farms, Inc., which is private property.

In an effort to address these concerns, the CGSS sought additional information from the Applicant in a letter dated August 24, 2022. In part, the letter requested a table providing updated tax map parcel numbers and including the name of each site/field, wetted acreage, etc. On October 21, 2022, the Applicant provided the verified Parcel ID Numbers. Accordingly, the revised information has now been incorporated into Part I.A of the revised Draft Permits.

7. Wastewater Treatment Technology

Public comments voiced concern that the wastewater treatment methods used by the Facility are not capable of treating to the standards that newer methods can achieve. Commenters also noted that the wastewater treatment plant should be able to handle increased capacity from population expansion and treat wastewater from surrounding poultry processing facilities. In response, the TRM confirms that the wastewater treatment technology proposed for the upgrade is relevant and appropriate technology.

The Facility was upgraded in 2010 to a Biological Wastewater Treatment System using Aeration Chains (Biolac) that utilizes the Biological Nutrient Removal (BNR) process system to provide secondary treatment of the effluent. The BNR removes the TN and TP from wastewater by utilizing microorganisms under different environmental conditions in the treatment process. A key component to the Biolac process is that it uses a longer retention time with more biomass to handle fluctuating loads and limit operator intervention.

The wastewater treatment system also utilizes the Biolac Wave-Ox process, where automatic control of the air flow distribution to the moving aeration chains creates oxic and anoxic zones. This repeated cycling of zones nitrifies and denitrifies the wastewater, and can typically remove nitrogen to 5 mg/l. Moreover, an additional construction phase of the Facility has been proposed that will use the BNR process and an effluent filtration facility to increase the capability to treat additional flow generated by future population growth.

The Design Engineering Report ("DER") for the Phase 2 expansion used actual flow characteristics for the wastewater from 2012 through 2020. An influent peak factor was included in the Application to reflect the change in the flow during the calendar year. The Application projected the flow for 2030 and designed the treatment plant upgrades to process the anticipated increase in volume. Historical concentrations of the wastewater were also presented in the DER and adjusted using a peak factor for the proposed upgrades to the treatment plant. The report also states that the primary source of wastewater the plant receives is domestic (i.e., municipal).

8. <u>Treatment System Capacity</u>

Public comments received in this matter expressed concern that the Facility will not be able to treat and dispose of the increased quantity of wastewater the system will receive from the existing and potential increase in population. In response, the Department's TRM notes that the DER for the Phase 2 expansion project used actual flow characteristics for wastewater volume from 2012 through 2020. An influent peak factor was included in the application to reflect the change in the flow during the calendar year.

The Application projected the flow for 2030 and designed the treatment system upgrades to process the anticipated increase in volume. Historical concentrations of the wastewater were also presented in the DER and adjusted using a peak factor for the proposed upgrades to the treatment system. The Report further notes that a future expansion to the Facility is planned, and that the proposed upgrades facilitate the potential expansion.

Currently, Phase 1 is designed to treat 2.0 MGD of wastewater and to dispose of up to 2.65 MGD of treated effluent. The Phase 2 project's scope includes increasing the facility's treatment capacity from 2.0 MGD to 4.0 MGD by the installation of new screening and grit removal systems, constructing two additional biological nutrient removal Biolac aeration lagoons, constructing two new clarifiers, and upgrading/expanding existing pumps, blowers, biosolids, filtration, and irrigation pump systems. The Phase 2 upgrades and expansion will also increase disposal capacity from 2.65 MGD to 6.96 MGD on an annual average basis by adding approximately 347.9 wetted acres on County-owned forested land.

In accordance with Section 6.3.1.15 of the *Regulations*, once wastewater flow reaches 80% of the permitted treatment capacity for the constructed phase, the permittee must submit notification and a work plan for the construction of the next phase to the Department. The Permittee will also be required to submit a Construction Permit Application, a DER, Plans and Specifications for review by the Department for permitting of the next phase. Any flow above the permitted flow shall not be allowed to be discharged to the system until construction is completed on the following phase and an amended operating permit has been issued by the Department for the next phase. Part IV.A.14 of the *revised* draft Operations Permit for the IBRWTF reiterates this requirement.

9. <u>Constructed Submerged Gravel Wetland System</u>

Public comments received in this matter voiced concerns that the proposed constructed submerged gravel wetland system research project could negatively impact the groundwater quality in the area. In response to these concerns, the Department's TRM provides significant detail regarding this aspect of the Applicant's proposed project.

It should be noted that the actual discharge of treated wastewater to the wetland system will require *separate* Department approval that is not part of the currently pending Application package. Nevertheless, to be fully responsive to the concerns raised about this aspect of the Applicant's project, a brief summary of the wetland system is discussed herein below.

The Phase 2 project includes the construction and potential use of a submerged gravel wetland system. The wetland system is a research and demonstration project designed to evaluate the effectiveness of constructed wetlands to serve as an innovative alternative to treated wastewater storage in lagoons, providing both an enhanced treated wastewater disposal option and a remediation of local groundwater resources. Operation of the submerged gravel wetland system would occur as a pilot study, the first phase of which would utilize groundwater within the spray field as the wetland water source to assess nutrient removal/remediation capabilities. The Department will detail the specifics of how the County would potentially be allowed to operate the wetland system, and the pilot study will determine whether the wetland system will be fully permitted in the future for treated wastewater use.

The County is proposing this pilot project to address two significant concerns raised by the public: (1) lack of disposal contingencies during times when it is inappropriate to spray irrigate (e.g., heavy precipitation and freezing event); and (2) localized elevated nutrients in groundwater. The constructed submerged gravel wetland system pilot project will provide the data necessary to make a science-based conclusion to determine whether a wetland system can be utilized as an alternative disposal outlet. The Department's TRM notes that it is critically important to investigate alternative disposal methods considering increased population growth, limited land availability, and major climate disruptions. In addition, the pilot project will be initiated using groundwater prior to the use of treated wastewater. This will allow the testing of basic biological and hydrological processes in such a manner that public health and the environment is protected.

The groundwater beneath the field proposed to be used for the construction of the wetland system has historically contained elevated nutrients. Using groundwater in the testing process will allow the County and Division to assess if a constructed wetland system can be utilized as a groundwater mitigation system. The TRM further notes that it is essential for pilot projects such as this wetland project to be operated and studied to allow both the State and Permittees to develop new technology and processes to further enhance environmental protection.

To ensure the pilot wetland project will be protective of public health and the environment, the Permittee proposes to use the existing groundwater monitoring network on the North Burton field consisting of four wells (MW2, MW-12, MW-16, and OW-17) and install four (4) additional groundwater monitoring wells concurrently with the construction of the wetland system. The monitoring wells would require the same sampling procedures as the groundwater monitoring wells in the spray fields at the site. The wells will be equipped with water level monitoring instruments to provide daily water level measurements. This data, in conjunction with daily loading rates and precipitation data, will provide a high-resolution understanding of the mounding effects resulting from the use of the wetland system. This operational testing data will provide the information necessary to calibrate a refined numerical model which could assist with the loading schedules based on seasonal, local environmental patterns, as well as month to month operations during the Project.

In conclusion, the Department's TRM notes that the design of the proposed pilot constructed submerged gravel wetland system at the IBRWTF, coupled with the effluent quality, design diversion capabilities, detailed contingency plans, groundwater monitoring network, and routine data assessments performed by both the Division and Permittee, is protective of public health and the environment, including the protection of the local drinking water supply and aquifer.

10. <u>Site Excavation</u>

Public comment received in this matter noted that there appeared to be excavation and soil disturbance at IBRWTF prior to the Applicant obtaining a construction permit for the observed activity. In response, the Department's TRM states that the CGSS is aware of activities at the Facility which do not require a permit from the Division of Water. For example, the Division of Water is aware of a large stormwater drainage improvement project at the Facility, which has an approved NPDES Construction Stormwater Permit coverage under the oversite of the Sussex Conservation District.

11. Compliance and Enforcement

The comments received by the Department regarding this permitting package expressed concerns relative to the historical compliance of the Applicant. In response, the TRM notes that the IBRWTF is currently operating under an existing Operations Permit with effluent limitations, operational, monitoring, and reporting requirements. Under this permit, the Division performs annual Facility inspections to ensure permit and regulatory compliance. The Facility was inspected in 2020, 2021, 2022, and 2023. Inspectors did not observe any significant compliance issues and the Division has not issued any Notices of Violations. In addition, the current system routinely meets a TN of less than 10 mg/L, with the 2023 average concentration being 5.9 mg/L. It should also be noted that the facility upgrades will improve the system's already strong operational performance and the expanded disposal options will allow treated effluent to be discharged for beneficial reuse.

With regard to Facility operations, both the existing and proposed permits require the following of the Permittee:

> *[To] 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 may include, 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*."

In addition, both the existing and proposed permits require the Permittee to report (verbally and in writing) when the Permittee becomes "aware of any noncompliance that may endanger the public health or the environment." This includes written notification that provides the following information:

> (*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 Department's TRM states that the Division of Water is confident that safeguards are in place to ensure the IBRWTF complies with permit effluent limitations, operational, monitoring, and reporting requirements. However, to further address the public comments, the Division is including the following *revised* language to the standard facilities operation condition:

> *The Permittee shall immediately perform clean-up and disinfection actions upon becoming aware of a sanitary sewer overflow (SSO) event. In addition, the Permittee shall notify the Division of Water within 24-hours from the time the Permittee becomes aware of the SSO event and shall submit the following information with 5-days of providing notification:*
>
> *a) The facility name and location of release.*
>
> *b) An estimate of the quantity of sewage released.*
>
> *c) The date, time, and duration of the release.*
>
> *d) The clean-up and disinfection methods utilized.*
>
> *e) The date and time of completed clean-up and disinfection activities.*
>
> *f) Any other information as the Division of Water may require.*

The above revision will ensure that any unintended sanitary sewer overflows (a condition in which untreated sewage is discharged from a sanitary sewer into the environment prior to reaching the wastewater treatment system) are reported to the CGSS and properly cleaned-up and disinfected. The revised language also provides the Division of Water with an opportunity to perform follow-up inspections, mandate specific corrective actions, and track short and long-term occurrences to determine whether additional upgrades to the Facility's wastewater treatment system is required.

12. <u>Mountaire</u>

The Department received comments expressing concerns that Mountaire had applied biosolids on the current spray irrigation fields at IBRWTF, resulting in contamination. In response, the Department's TRM notes that Mountaire previously owned the Hettie Lingo field, and land applied biosolids on to the Hettie Lingo field in accordance with a Division of Water-issued land application permit (last permit issued April 1, 1997, and amended March 14, 2001; Permit Number AGU 001/89B). The Hettie Lingo field was subsequently sold to Sussex County, who had it permitted for spray irrigation for use under the IBRWTF Spray Irrigation Operations Renewal and Modification Permit.

In accordance with the Department's *Guidance and Regulations Governing the Land Treatment of Wastes* (7 DE Admin. Code 7103), a site investigation to determine suitability for spray irrigation was performed for the Hettie Lingo fields. Both a Soils and a Hydrogeologic Evaluation were prepared by a State of Delaware Registered Professional Geologist. The field was determined to be suitable for use for spray irrigation. The TRM further notes that continued monitoring is required by the *revised* Draft Operations Renewal and Modification Permit for groundwater and soils.

13. <u>Division of Fish and Wildlife</u>

The Department's Division of Fish and Wildlife requested an opportunity to conduct biological surveys within the project area to evaluate habitat and determine the potential for species impacts and address conservation concerns. The Department's Division of Fish & Wildlife request was forwarded to the Applicant on August 24, 2022. Staff were able to survey the site on September 14, 2022, and the findings from this site survey were summarized in a letter addressed to the County dated October 17, 2022 (included as Appendix IV of the Department's TRM) and, in part, provided the following information:

On Wednesday, September 14, 2022, Bill McAvoy, staff biologist from the DNREC Division of Fish and Wildlife, surveyed the above referenced property for evidence of State rare plants and natural communities. The property was surveyed on foot and no State rare or federally listed plants or unique plant communities were found. Furthermore, we foresee no negative impacts to the forested areas of concern.

As a result, at present, this project does not lie within a State Natural Heritage Site, nor does it lie within a Delaware National Estuarine Research Reserve which are two criteria used to identify "Designated Critical Resource Waters" in the Army Corps of Engineers (ACOE) Nationwide Permit General Condition No. 22. A copy of this letter shall be included in any permit application or pre-construction notification submitted to the Army Corps of Engineers for activities on this property.

Required Permit Revisions to Original Draft Permits (to address public comments)

As noted above, numerous revisions to both the original Draft Construction Permit and Draft Operations Permit were necessitated for the Department to fully address the public's comments, concerns and questions received in this matter. The Department's TRM notes that these revisions make the *revised* Permits more stringent and further enhance the ability of the Department to protect public health and the environment.

It should be noted that a red-lined *revised* Draft Construction Permit is attached to the Department's TRM as Appendix V, and a clean copy of the finalized *revised* Draft Construction Permit is attached thereto as Appendix VI. Similarly, a red-lined *revised* Draft Operations Permit is attached to the Department's TRM as Appendix VII, and a clean copy of the finalized *revised* Draft Operations Permit is attached thereto as Appendix VIII.

Required Revisions to Original Draft Construction Permit

1. **Facility Name**

The Facility's name originally read "Inland Bays Wastewater Treatment Facility (IBWTF)." To be consistent with the Application, the *revised* Draft Permit has been corrected to read "Inland Bays Regional Wastewater Treatment Facility (IBRWTF)." The Facility's address and physical location have also been further clarified.

2. **Tax Parcel Numbers**

Public comment noted that the Application's tax parcel IDs contained errors. The verified Tax Parcel numbers have now been incorporated into both *revised* Draft Permits.

3. **Facility Maps**

For additional clarification, the CGSS has replaced older maps with GIS-created enhanced maps to help elucidate locations of specific discharge points, and to help with future facility inspections by Department staff.

4. **Drawings**

For additional clarification, the CGSS replaced the drawings found in the original Draft Permits with specific references to the drawings in the application materials, as the Division determined that the sizing of the drawings required for incorporation into the draft permits significantly reduced their legibility and potentially created confusion. Furthermore, additional revised and clarifying information is now included in the *Constructed Submerged Gravel Wetland System* Section.

5. **Facility Specific Condition - Nitrogen Balance**

The original Draft Permit required the Permittee to submit a design Nitrogen Balance for Fields C and D. This was an error. The Nitrogen Balances for Fields C and D were provided with the Application. Therefore, this requirement has been deleted from the *revised* Draft Permit.

6. Storage Lagoon Reserved-Land Requirements

The CGSS has added a facility-specific condition to require the Permittee to maintain a 17.6-acre reserve area for a future storage lagoon if the Division deems its construction and operation is necessary for the protection of public health and the environment. The reserve area is depicted on the October 2020 Drawing C02.01 by Whitman Requardt & Associates, LLP.

7. Monitoring Requirements

A monitoring condition requiring the installation of lysimeters in spray irrigation fields A, B, C, and D has now been added to capture and characterize vadose zone percolate. In addition, background groundwater quality sampling is now required prior to disposal activities. Table 4 has been added to outline sampling parameters. Also, lysimeter installation and monitoring submission requirements are now added as well.

8. Construction Completion Package Submission Requirement

The *revised* Draft Permit now requires the submission of groundwater monitoring well information, groundwater background sampling results, and lysimeter information.

9. Miscellaneous Revisions

Lastly, minor general clarifying changes and typographic error fixes have been made in the *revised* Draft Permit, including updating the Department's Section name (due to recent Division re-organization) and revising the overall permit formatting.

Required Revisions to Original Draft Operations Permit

1. Facility Information

Revisions made to the facility's address, physical location, and tax parcel IDs mirror the corrections and clarifications set forth above. In addition, a listing of authorized discharge types (i.e., spray, RIBs, agricultural distribution, and wetland system) has been added for clarity.

2. Facility Maps

As noted above, the CGSS replaced older maps with GIS-created enhanced maps to help elucidate locations of specific discharge points, and to help with future facility inspections by Division staff.

3. Drawings

For additional clarification, the CGSS has replaced the drawings found in the original Draft Operations Renewal and Modification Permit with specific references to the drawings in the Application materials. Upon review of the original drawings, the Division of Water determined that the sizing of the drawings required for incorporation into the original Draft Permits significantly reduced their legibility and potentially created confusion. In addition, revised and clarifying information was included in the *Constructed Submerged Gravel Wetland System* Section.

4. New and Existing Spray Fields

The New and Existing Spray Fields Table, previously found in the original Draft Operations Renewal and Modification Permit, has been moved to Part I.A, *Description of Operations Renewal and Modification and Discharges*. The table has also been updated to include the Tax Map Parcel Numbers for each field and the table is divided into two separate tables: Phase 1 Spray Fields and Phase 2 Spray Fields.

5. Agricultural Fields Receiving Distributed Treated Wastewater

Table 3, *Agricultural Fields Receiving Distributed Treated Wastewater*, has been relocated to Part I.A, *Description of Operations Renewal and Modification and Discharges.*

6. Description of Operations Renewal and Modification and Discharges

Part I.A, *Description of Operations Renewal and Modification and Discharges*, has been slightly modified and re-organized for clarity.

7. Documentation

The *Documentation* Section has been updated to include the County's response letter, dated October 21, 2022, to the Division's Request for Additional Information, dated August 24, 2022 (listed as Part I.B.1.n.).

8. Permit Limitations

A condition has been added (*see* Part I.D) to clarify that, unless specified otherwise, all permit conditions set forth in the Permit apply to both Phase 1 and Phase 2 operations.

9. Vegetative Management Plan for Phase 1 Fields

A vegetative management plan condition (*see* Part I.E) has been added, requiring the spray disposal fields be maintained, in accordance with the October 2020 DER (unless an alternative vegetative management plan is submitted and approved by the Division), to address instances of compromised crop growth/density or change in vegetation.

10. Forest Stewardship Plan for Phase 2 Fields A, B, C and D

A condition has been added (*see* Part I.F) to now require the Permittee to provide to the Department a finalized Forest Stewardship Plan for Fields A, B, C and D within 60 days of the effective date of the Permit. The Plan is required to be reviewed by the Department of Agriculture and executed by both party's signature.

The condition also requires the Permittee to maintain a current copy of the Forest Stewardship Plan on file with the Division of Water and operate in accordance with the Forest Stewardship Plan.

11. Storage Lagoon Reserved-Land Requirements

A facility-specific condition has been added (*see* Part I.G) to require the Permittee to maintain a 17.6-acre reserve area for a future storage lagoon if the Division of Water deems its construction and operation is necessary for the protection of public health and the environment. The reserve area is depicted on the October 2020 Drawing C02.01 by Whitman Requardt & Associates, LLP.

12. Effluent Limitations

a. Revised Table 5 field acreage
b. Revised Effluent Total Nitrogen Concentration (Condition Part I.2) to acknowledge that construction activities may impact water quality. This is not considered a violation provided the activities are scheduled, the percolate doesn't exceed 10 mg/L at the spray disposal fields, and all other in appropriate discharges cease.
c. Revised Effluent Total Nitrogen Limitation Contingency Plan (Condition Part I.3) to ensure that the Permittee incorporates the elevated effluent total nitrogen concentrations into design nitrogen balances to calculate reduced loading rates that will not cause the percolate to exceed drinking water standards for Nitrates for the authorized spray fields. Calculations required to be performed and submitted monthly to the Department for each month total nitrogen concentrations exceed 10 mg/L. Volumes irrigated are not allowed to exceed the calculated reduced loading rates for the month.
d. Added a Total Phosphorous Effluent Concentration of 8.0 mg/L (Condition Part I.4) to address public comments associated with the wastewater treatment system's effluent water quality. The condition includes language that acknowledges that construction activities may impact water quality. This is not considered a violation provided the activities are scheduled and all other in appropriate discharges cease.

e. Added an Effluent Total Phosphorous Limitation Contingency Plan (Condition Part I.5) that ensure appropriate notification, investigation, and the cessation of all in appropriate discharges.
f. Revised the Chloride limitation from an annual average basis metric to a rolling 12-month average metric. The numerical limit of 250 mg/L does not change.
g. Revised the Sodium limitation from an annual average basis metric to a rolling 12-month average metric. The numerical limit of 210 mg/L does not change.

13. Buffer Requirements

Phase 2 buffer requirements, if applicable (*see* Part I.J.2), have now been added.

14. Sludge Handling Requirement

The *Sludge Handling Requirements* have been revised to now prohibit the land application of Class B biosolids, in accordance with the facility's current sludge handling plan. Additionally, land application language that no longer applies has been removed. Further, the Permittee is now required to report the land application of Class A biosolids to the Department, in accordance with fertilizer requirements (*see* Part I.K and Part II.A.8a).

15. Monitoring Requirements

a. Added Table 10 displaying monitoring wells for the Phase 2 Spray Fields.
b. Added Table 11 displaying monitoring wells for the constructed wetland system.
c. Added Table 12 (in part) requirement for metals to be tested in groundwater every 5 years.
d. Added placeholder table for future lysimeters.

16. Operational Monitoring Requirements: Fertilizer

To address concerns associated with fertilizer use, a notification condition (*see* Part II.A.8a) has now been added. The condition (1) only authorizes fertilizer use in a manner protective of groundwater; (2) requires notification to the Department within 48 hours of fertilizer application; and (3) requires the submission of fertilizer monitoring data in the appropriate monthly DMRs. The condition further states that the Department reserves the right to revoke the authorization of fertilizer application if monitoring identifies impacts to groundwater, or the Permittee fails to submit complete and accurate monitoring data.

17. Operational Monitoring Requirements: Storage Volume Monitoring

To address concerns associated with lagoon usage, a storage volume monitoring condition has now been added (*see* Part II.A.8b). Volumes are required to be monitored in both storage lagoons. Each lagoon volume will be reported in depth (ft) and volume (MG), and compared to the total depth available in each lagoon in depth (ft) and volume (MG). The combined volume of storage will also be reported in volume (MG) in comparison to the combined capacity of both storage lagoons in depth (ft) and volume (MG). In addition, the Department is requiring the reporting of available freeboard in the monthly DMRs (*see* Table 19).

18. Annual Nutrient Loading Report Condition

In recognition that the Inland Bays Watershed is of "Exceptional Recreational and Ecological Significance," a condition has been added (*see* Part II.B.6) requiring an Annual Nutrient Loading Report be submitted as a supplement to the Facility's Annual Report. The Annual Nutrient Loading Report will require the Permittee to calculate the monthly and total annual loading and offsets (e.g., septic connections, stormwater BMPs, biosolids removal, etc.) for TN and TP for all here-in permitted discharge locations.

In addition, the Permit will also require the submission of the Annual Nutrient Loading Report within four (4) years of the Permit's effective date, and that the Permittee submit a 10-year sanitary buildout and loading and offset analysis to characterize the potential nutrient (TN and total TP) impacts of the IBRWTF on the Inland Bays Watershed (consisting of Indian River, Indian River Bay, Rehoboth Bay, and their tributaries).

19. Facilities Operation Condition

New language has now been added (*see* Condition Part IV.A.3) requiring the Permittee to immediately perform clean-up and disinfection actions upon becoming aware of a sanitary sewer overflow (SSO) event. In addition, the Permittee is required to notify the Division of Water within twenty-four hours from the time the Permittee becomes aware of the SSO, and the condition also requires the Permittee to submit the specific information including: date, time, location, volume, and clean-up documentation.

20. Miscellaneous Revisions

Lastly, minor general clarifying changes and typographic error fixes have now been made, including the updating of the Section name (due to recent Division re-organization) and the revising of the overall permit formatting.

I find that the Division of Water's TRM offers a thorough review of all aspects of the Applicant's pending Applications, addresses those concerns germane to the subject matter of the aforementioned public hearing held by the Department in this matter, and responds to them in a balanced manner, accurately reflecting the information contained in the Record. I further find that the Record developed in this matter reflects that the Department's experts in the CGSS have concluded that the County's Applications for the proposed Phase 2 upgrade and expansion project at the IBRWTF, and the associated *revised* Draft Construction Permit and *revised* Draft Operations Permit authorizing the construction project and the current and future operation of the IBRWTF, are complete and in accordance with the applicable regulatory requirements of 7 DE Admin. Code 7101, *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal*, along with 7 *Del.C.* Ch. 60.

As set forth in the TRM, the *revised* Draft Construction Permit includes a schedule of compliance, construction requirements, monitoring equipment installation requirements, and project completion reporting requirements designed to assure proper system construction, reduce treatment system malfunctions, ensure the retention of construction documents, and ultimately result in a wastewater treatment system that is protective of water resources and the public's health, safety, and welfare. Additionally, the *revised* Draft Operations Permit Amendment includes effluent limitations, operational, monitoring and reporting requirements designed to protect human health and the environment.

The Department's TRM notes that the most significant revision to the original Draft Permits to address public comments regarding the IBRWTF's potential impact to the Inland Bays Watershed is the addition of a condition requiring the Permittee to submit an Annual Nutrient Loading Report that will calculate the monthly and total annual nutrient loading and offsets (e.g., septic connections, stormwater BMPs, biosolids removal, etc.) for TN and TP for all permitted discharge locations. The condition also requires the submission within four (4) years of a 10-year sanitary buildout and loading and offset analysis to characterize the potential nutrient (total nitrogen and total phosphorus) impacts of the IBRWTF's operations on the Inland Bays Watershed.

This revised condition, along with the already extensive water quality monitoring network using lysimeters (in-field), monitoring wells (in-field, up-gradient, and down-gradient) and soils monitoring, will allow the Department's subject matter experts in the CGSS to better assess the potential future impacts the IBRWTF's operations may have on groundwater and surface water resources within and adjacent to the facility. In the event trends of increasing water quality pollutant concentrations and/or other impacts are observed, the Permittee will be required take all necessary actions to eliminate and/or correct any adverse impact on public health or the environment resulting from facility operations.

The TRM further notes that the proposed upgrade and expansion project at the IBRWTF is a response to Sussex County's changing landscapes, population growth, and climate. The *revised* Draft Permits are designed to support these realities, while still providing significant protection of public health and the environment. In particular, the *revised* Draft Operations Renewal and Modification Permit will significantly increase the disposal options available to the IBRWTF.

At the present time, IBRWTF is only authorized to utilize specific fields for disposal by spray irrigation. Under the Applicant's proposed upgrade and expansion project, additional spray disposal fields, agricultural fields for distribution of treated wastewater, and interconnections with various rapid infiltration basin (RIB) systems will be available for disposal of wastewater. This dispersal of treated wastewater reduces the potential for excessive nutrient loading from occurring in a single area, provides disposal options during periods when conditions for spray irrigation are unsuitable (i.e., discharge to RIBs during rain events), and reduces the use of potable water for agricultural irrigation.

Additionally, as noted previously herein, the Phase 2 project includes the construction and potential use of a submerged gravel wetland system, which will function as a research and demonstration project designed to (1) evaluate the effectiveness of constructed wetlands to serve as an innovative alternative to treated wastewater storage in lagoons; (2) provide an enhanced treated wastewater disposal option; and (3) remediate local groundwater resources. The actual discharge of treated wastewater to the wetland system will require separate Department approval, and the same is not a part of the permitting package currently pending before the Department at this time. Nevertheless, it is important to reiterate herein that the operation of the submerged gravel wetland system will occur as a pilot study, the first phase of which will utilize groundwater within the spray field as the wetland water source to assess nutrient removal/remediation capabilities. The pilot study will inform the Department whether the County will be permitted to send effluent to the wetland system, as well as whether the wetland system would be fully permitted for treated wastewater use once the pilot study is complete.

The groundwater beneath the field proposed to be used for the construction of the wetland system has historically contained elevated nutrients. Using groundwater in the testing process will allow the County and Division to assess if a constructed wetland system can be utilized as a groundwater mitigation system. As the TRM notes, it is essential for pilot projects such as this wetland project to be operated and studied to allow both the State and Permittees to develop new technology and processes to further enhance environmental protection.

I find and conclude that the above revisions to the requisite Draft Permits required of the Applicant for the Phase 2 proposed project result in a more rigorous protection of public health and the environment. I further find and conclude that the Department's subject matter experts in the CGSS have recommended the issuance of both the *revised* Draft Construction Permit and the *revised* Draft Operations Permit, as proposed for Sussex County's IBRWTF Phase 2 upgrades and expansion project. Moreover, I find and conclude that the CGSS has addressed the comments and concerns voiced by the public in this matter, and included revisions to the proposed draft permits to address those public comments and concerns as appropriate.

The mission of DNREC is to engage stakeholders to ensure the wise management, conservation, and enhancement of the State's natural resources; protect public health and the environment; provide quality outdoor recreation; improve quality of life; lead energy policy and climate preparedness; and educate the public on historic, cultural, and natural resource use, requirements, and issues. It is the policy of DNREC that no person shall, on the grounds of race, color, national origin, sex, age, or disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance, as provided by Title VI of the *Civil Rights Act of 1964*, the *Rehabilitation Act of 1973,* the *Civil Rights Restoration Act of 1987*, and all other related nondiscrimination laws and requirements. The Department's subject matter experts in the Division of Water, CGSS, have reviewed the Record generated in this matter, and have determined that the issuance of the finalized *revised* Draft Permits, as set forth above, is consistent with DNREC's Environmental Justice policy.

I find and conclude that the Record supports issuance of both the *revised* Draft Construction Permit and the *revised* Draft Operations Permit for the County's IBRWTF Phase 2 upgrades and expansion project, as submitted by the Applicant to the Department's Division of Water, CGSS, in this matter. Upon approval, the finalized *revised* Permits to be issued to the County by the Department would be consistent with the *revised* Draft Permit authorizations prepared by the Department's experts in the Division of Water, CGSS, with appropriate conditions, to ensure continued protection of public health and the environment, and reflective of the Record developed in this matter.

Accordingly, this Order hereby authorizes the issuance of the finalized Construction Permit and the finalized Operations Permit, for the County's IBRWTF Phase 2 upgrades and expansion project, as described above.

Further, this Order concludes and specifically directs the following:

1. The Department has jurisdiction, as provided for under 7 *Del.C.* Ch. 60, *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* (7 DE Admin. Code 7101), and all other relevant statutory authority, to make a final determination on the aforementioned pending permit Applications after holding a public hearing, considering the public comments, and all information contained in the Record generated in this matter;

2. The Department provided proper public notice of the aforementioned Applications submitted by the Applicant, and of the public hearing held on May 10, 2022, and held the hearing to consider any public comments that may be offered on the Applications, in a manner required by the law and regulations;

3. The Department considered all timely and relevant public comments in the Record, as established in the Department's TRM dated March 26, 2024, and all of the associated relevant documents included in the Appendices therein;

4. The Department has carefully considered the factors required to be weighed in issuing all permits and authorizations necessitated by the aforementioned Applications, and finds that the Record supports approval of the same;

5. The Department shall issue the following authorizations to the Applicant in this matter: (1) the finalized *revised* Phase 2 Construction Permit; and (2) the finalized *revised* Operations Renewal and Modification Permit, authorizing the County's Inland Bays Regional Wastewater Treatment Facility Phase 2 upgrades and expansion project, as described above, with the appropriate conditions as set forth herein, consistent with the Draft Permit authorizations prepared by the Department's Division of Water, CGSS, and consistent with the Record developed in this matter, to ensure that Delaware's environment and public health will be protected from harm;

6. The Department adopts the Report and all Appendices attached thereto as further support for this decision;

7. The Department has an adequate Record for its decision, and no further public hearing is appropriate or necessary; and

8. The Department shall serve and publish its Order on its internet site.

Shawn M. Garvin
Secretary