

EXHIBIT F

Baird, Mandalas, Brockstedt
1413 Savannah Road, Suite 1
Lewes, Delaware
19958

Attn: Mr. Chase Brockstedt

Re: Mountaire – Draft Construction and Operation Permits

May 20, 2020

This letter report is my evaluation as an expert in wastewater treatment and residuals handling of the Draft Construction and Operation Permits for the wastewater treatment and disposal facilities at the Mountaire poultry facility in Millsboro, Delaware. I have reviewed the April 29, 2020 Drafts to Construct and to Operate the WWTP (Wastewater Treatment Plant) and Spray Discharge system. I also reviewed the very limited supporting documents posted on DNREC's website, including the February 5, 2020 Final Design Summary (FDS) prepared for Mountaire by Reid Engineering along with supporting technical drawings and technical specifications, a series of drone video footage taken recently, and standard wastewater reference manuals. My opinions and conclusions are also based on my education, experience, and training in the environmental, engineering and science of the treatment of poultry wastewater, WWTP operation, discharge of treated effluent, disposal of residual sludges and floatables, management of these processes, and the related regulations, standards of practice, and public health requirements. All opinions expressed herein are based on the information received and documents currently available and may be modified as more information is discovered or becomes available.

Qualifications:

My education and my entire working career have been dedicated exclusively to wastewater and residuals treatment including treatment plant engineering and design, plant operations, treated effluent discharge, and residuals (sludge) disposal and management. My Bachelor of Environmental Engineering and Master of Water Quality Engineering both came from Vanderbilt University with an emphasis on wastewater treatment.

After graduation I worked as an Engineering Consultant evaluating wastewater treatment systems to: assess performance capability; determine reasons for failure and methods of cure; determine performance efficiency and improvements where possible. In 1981 I started my own Environmental Technology company and introduced new processes to the field: my 17 patents were the basis of design for over 700 WWTP's located in over 17 countries, treating many kinds of industrial wastewater, sanitary wastewater, and associated residuals. I personally designed and provided process and mechanical troubleshooting and problem solving for hundreds of those systems, including six poultry plants and dozens of other animal processing and food production plants.

I spent years as a Vice President of Technology for two of the largest wastewater treatment companies in the world: U.S. Filter (now Evoqua), and Veolia Water. I continue to consult with the company. The past 18 years I have operated my own consulting firm specializing in all aspects of wastewater treatment.

Commentary:

My comments on these Draft Permits are as follows:

1. Review of these Draft Permits was of limited value considering the supportive documents (February 5, 2020 Reid FDS, Technical Specifications, and WWTP Detail Drawings) describe a WWTP design quite different from the one described in the Draft Permits. The Reid FDS in February 2020 described a design which provided for 36 million gallons (MG) of anaerobic lagoon capacity, including a new 22-MG lagoon.

But in the two Draft Permits, the 36-MG of lagoons are replaced with 7 MG of Equalization tanks that achieve no removal of any pollutants. There appear to be no other major changes. In short, an updated FDS which shows how the treatment plant will operate and produce an effluent with a maximum of 10 mg/l nitrogen - is missing.

2. The use of anaerobic lagoons is not critical. The proposed permit limits can be met either with anaerobic lagoons or with the proposed equalization tanks. However, the design of the WWTP and especially the critical nitrogen-removal section of the WWTP is quite different in the two designs. The anaerobic lagoons would achieve, per Reid, at least 70% removal of BOD (organics) and up to 50% removal of TSS (solids). Therefore the 'new' design without anaerobic lagoons would require much more subsequent Anoxic/Aerobic treatment (larger treatment basins, larger aeration system, etc) to achieve the effluent permit values and produce an effluent with TN<10 mg/l. It cannot be that the same treatment capacity is appropriate for a wastewater with 40,000 to 68,000 lbs/d of BOD as for 12000 to 20,000 lbs/d. Since most of the BOD is soluble, it will not be removed by the proposed DAF treatment system and so it is unlikely to make a large difference in required nitrogen-removal treatment capacity.
3. The proposed design assumes a minimum winter liquid temperature of 15°C (59°F) which appears to be overly optimistic, especially with the new design replacing in-ground lagoons (relatively well-insulated) with 35-ft tall steel tanks above ground (perfect for cooling). Winter temperature has a profound effect on nitrogen removal and is a critical element of any design for nitrogen removal. Colder temperatures require larger treatment volumes; and as the liquid temperature drops below 15°C the treatment volume required increases dramatically. The Reid FDS stated that if the winter temperatures were colder than 15°C, then Mountaire WWTP operators could simply turn up the chemicals applied to the DAF pretreatment process. However, that is apparently already assumed with the new design. There is no document which presents a detailed Thermal Equilibrium balance assessing expected liquid temperature during the coldest possible winter month.
4. The nitrogen-removal process design will require much larger tankage and equipment due to the combined effects of 1) The loss of 36 MG of anaerobic lagoons, and 2) The likelihood of a colder winter temperature as the basis for design.
5. The most critical aspect of the WWTP design with respect to effluent nitrogen concentration is the sizing of the Anoxic/Aerated reactors. This is heavily influenced by the presence or absence of the anaerobic lagoons. Missing is any detailed explanation of the critical assumptions and operational parameters with design kinetics to explain how the same Anoxic/Aerobic reactors can meet effluent permit without the 70-80% reduction in loading afforded by functioning anaerobic lagoons.
6. The absence of anaerobic lagoons in the new design will mean the removal of some 2-3 times more BOD and more TSS (depending on Dissolved Air Flotation (DAF) efficiency), which generates equivalently more sludge than the WWTP with 36-MG of anaerobic Lagoons. And yet the clarifier capacity is only slightly improved, certainly not upsized equivalently. There is no explanation.
7. In order to remove 2-3 times more BOD, the new system requires 2-3 times more aeration capacity in the two Aerobic zones. There is no explanation how this will be accomplished.
8. In the new design, the removal of 2-3 times more sludge from the clarifiers necessarily requires that sludge handling equipment (digesters, thickeners, screw press) be 2-3 times larger. There is no explanation how this will be accomplished.
9. The former East Anaerobic lagoon is to be repurposed for storm water and off-spec treated wastewater storage. This decades-old lagoon is almost certainly leaking based on its age, construction and groundwater quality data between it and Swan Creek. There is no mention of relining that lagoon as should be required by DNREC for such applications.

10. The existing effluent storage (spray irrigation holding) lagoon volume has previously been reported in Engineering documents as 14.2 MG. It is now claimed in the proposed permit to be 22 MG. This appears to be an error.
11. The permit refers to a new 22-MG effluent storage lagoon to be constructed in the future. Yet it is not included as part of “the improvements” to be completed within three years of the granting of the permit. The date for this completion is missing.
12. If/when the proposed new 22-MG effluent storage lagoon is completed, Mountaire will still have just a total of 36.2-MG storage. That provides a mere 14-day storage volume between the two lagoons. Storage capacity for 60-90 days is necessary and appropriate for the Mid-Atlantic climate.
13. The materials submitted by Mountaire and Reid Engineering state clearly that the WWTP design submitted reflects “State of the Art” nitrogen-removal technology. The proposed permitted Effluent concentration of 10 mg/l TN (Total Nitrogen), maximum, is significantly greater than nitrogen-removal technologies are capable of producing and was “State of the Art” Biological Nitrogen Removal (BNR) prior to the 1980’s. WWTP designs similar to the “Post Upgrade Process” proposed for construction at Mountaire have been applied since the 1980’s in hundreds of WWTPs around the world on many different waste streams, including poultry processing. These so-called ENR processes (Enhanced Nutrient Removal) are well documented to produce effluent total nitrogen concentrations that consistently meet monthly averages of 3 mg/l TN with daily maximums of 5 or 6 mg/l TN. Data is available from at least four such ENR WWTPs treating poultry waste in Virginia that are required to meet an effluent limit of 6 mg/l TN. This lower limit not only reflects reasonable expectations of achievable performance but would significantly contribute to reducing groundwater and surface water nitrate contamination in the affected spray area.

Likewise, the proposed Spray Irrigation Operations Permit has some significant issues:

1. This proposed Permit is problematic just as the Draft Construction Permit is problematic – the Draft Spray Irrigation Operations permit refers to a “Post Upgrade” design with no anaerobic lagoons and with two new equalization basins, but the design cannot be reviewed critically because a Final Design Summary reflecting that approach has not been made available.
2. The document requires only once a month sampling of sprayed effluent nitrogen concentration. This frequency is clearly inadequate as the permittee could be grossly exceeding the limit for many days each month and then pick a day to sample after the plant recovers or on a day following a weekend when production is limited or non-existent. Similar NPDES permits with which I am familiar require more frequent sampling (e.g. daily) and that clearly should be included in this permit.
3. The permitted Effluent concentration of 10 mg/l TN (Total Nitrogen), as noted above, does not reflect the current level of Nitrogen Removal technology, and specifically the capabilities of the “State-of-the-Art” ENR process presented in the Draft permit. The “Post Upgrade” facility, if designed and operated properly, should be able to consistently meet average effluent total nitrogen concentrations of 3 mg/l and that limit should be specified in the proposed permit.

Please let me know if you have any questions concerning the above.

Regards,

Kenneth L. Norcross

