

Little Covenhope, Aymestrey, Herefordshire, HR6 9SY

Objection to Planning Application ref. 222728 on behalf of Herefordshire Campaign to Protect Rural England

Whitwick Manor, Lower Eggleton, HR8 2UE

The erection of and the construction of an anaerobic digestion (AD) plant with associated facilities, including feedstock storage clamps; tanks; lagoons and wetland filtration system; and connection to the national gas grid, together with the installation of photovoltaic panels on buildings, a grain store and dryer and the construction of a new vehicular access

CLAIMED THERMAL DESTRUCTION OF AMMONIA

These comments relate to the updated Emissions Modelling and Shadow Habitats Regulations Assessment submitted by the Applicant and do not supersede HCPRE's previous objections to the application.

It appears to HCPRE that central claims made in the emissions modelling report are patent nonsense, which undermine the credibility of the Applicant and the agents promoting the application.

These relate to emissions from the poultry manure storage buildings, which the modelling report acknowledges would be the largest potential source of ammonia.

The report claims that polluted air emitted from the buildings will be fed into the Combined Heat and Power plants (CHPs) and the ammonia thereby "thermally destroyed."

Thermal destruction of ammonia is a complex process requiring very high temperatures and typically the use of a catalyst. It entails significant infrastructure, normally including furnaces or heat exchangers and catalyst burners. The process converts ammonia to nitrogen and water.

CHPs do not do this. Their function is to convert biogas (or other fuel) to electricity, while capturing heat from the generation process. Air vented from the poultry storage buildings would not be a fuel.

While there is some experimentation into the use of ammonia as a fuel, its use is not yet established and ammonia is only one of many substances emitted from poultry manure, which will mix with the air in the building. The ammonia would not be in a form that could be used as fuel.

The CHPs are shown on the site plan at some distance from the poultry buildings. There will be two CHPs in the same location and evidently serving the same purpose as proposed when the previous emissions modelling was submitted, at which time the applicant did not make any claims about thermal destruction of ammonia or the use of emissions from the storage buildings as fuel.

The applicant's only "evidence" that the CHPs would be capable of "thermal destruction" of the ammonia is a claim at paragraph 4.2.2.6 of the modelling report that *"the technology provider has advised that complete thermal destruction of the ammonia is expected to be achieved in the CHP units."*

The advice from the technology provider is not disclosed and nor has the Applicant provided any information about the CHPs, despite the novel claim that they are apparently capable of both accepting contaminated air as fuel and thermally destroying ammonia.

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In the absence of this evidence (and on the basis of even a superficial understanding of the ammonia thermal decomposition process), the claims about management of ammonia emissions from the poultry manure storage buildings should be disregarded.

The claim undermines the entirety of the Applicant's modelling and the Shadow Habitats Regulations Assessment.

AMMONIA EMISSIONS FROM POULTRY MANURE STORAGE BUILDINGS

The modelling report also claims that the poultry buildings would use negative pressure to prevent emissions from the poultry manure. However, the application drawings show the buildings would have standard roller doors and no information is provided about any ventilation system.

A building capable of preventing fugitive emissions would require an entrance chamber with sealed doors at either end. Delivery vehicles would wait in this chamber for one door to close before the other opens. Given the management of emissions from the poultry manure is central to the acceptability of the proposed development, CPRE would expect the drawings to demonstrate that proposed mitigation can be delivered and secured by planning conditions requiring adherence to planning documents and drawings.

The drawings do not illustrate a negative pressure building. Roller shutters doors are not capable of producing air tight conditions.

AMMONIA EMISSIONS FROM REED BEDS

The Applicant has provided a letter from the reed bed provider, CQA International Ltd, dated 12th December 2024, which claims *"there will be no emissions of ammonia to the atmosphere from the reed beds"* and *"at short notice, we cannot provide supporting documentary evidence because the treatment in the aqueous phase is one of the key principles of reed bed design and performance. Ammonia emissions are simply not part of the process. We have not seen this issue raised on any previous projects and are not aware of any technical literature on the subject."*

In fact, there is much scientific research into ammonia emissions from reedbeds and the capacity of reedbeds to reduce emissions. Examples include:

- Influence of bed media characteristics on ammonia and nitrate removal in shallow horizontal subsurface flow constructed wetlands. Albuquerque, Oliveira ' Semitela, Amaral
- The design and performance of a vertical flow reed bed for the treatment of high ammonia, low suspended solids organic effluent. Michael Morris, Robert Herbert
- Initial contaminant removal performance factors in horizontal flow reed beds used for treating urban wastewater. García, Aguirre, Mujeriego , Yuming Huang, Ortiz, Bayona

Garcia et al found ammonia removal from different types of reed beds varied between 25% and 50%. The research consensus is that reed beds are a significant source of ammonia emissions and can reduce emissions only to a limited extent.

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Most of the research investigated the water industry. However, the principles and most of the pollutants are the same.

AMMONIA EMISSIONS FROM THE FEED HOPPERS

The modelling report asserts that the feed hoppers would be open for a surprisingly precise 44 minutes per day, making no allowances for inefficiencies, accidents or spills.

Ammonia emissions from the hoppers were modelled using the Environment Agency's emission factor of 1.12 kg/nh₃-tonne/yr for the storage of broiler manure. The EA's emission factor for poultry layer manure is much higher at 2.68 kg/nh₃/tonne/yr and should have been used for at least part of the manure, given that the Applicant has not identified the source of all the manure feedstock. Even if all of the manure were sourced from Avara, that company operates a number of broiler layer units, providing eggs to the hatcheries, so the higher emission factor should have been used for at least a component of the manure.

UNCERTAINTY

The modelling report, while claiming to have used conservative figures, is based on the site operating under idealised conditions in which operatives are always efficient and spills and accidents do not occur.

The report takes the same approach when considering uncertainty in the model. It is based on the assumption that *"that the plant will emit at the maximum permitted levels, 24-hours per day, 365 days per year"*. This is presumably by reference to the Environmental Permit, although this is not explained and these "permitted levels" are not disclosed in the report. Emissions from installations with environmental permits frequently exceed their permitted emissions targets for extended periods, due to poor management, old or faulty technology or accidents. This is evinced by the EA's reporting of pollution incidents from anaerobic digesters, for example in this report:

https://consult.environment-agency.gov.uk/environmental-permitting/standard-rules-consultation-no-20/user_uploads/incidents-report--2010-2018--final.pdf

REED BED REMOVAL OF NUTRIENTS

The letter from CQA also responds to concerns raised about the performance of the reed beds in removing phosphates and other pollutants from the digestate.

The letter references laboratory testing showing *"achieved results that were significantly lower than both the discharge permit and the nutrient pollution standard."*

The test results are not provided and it is unclear whether they have been peer reviewed. Laboratory tests are not a substitute for real world conditions: the efficacy of the reed beds is likely to be affected by external factors, including high and low temperatures, heavy rainfall or drought and plant diseases.

The *"innovative adsorption medium"* proposed for use in the reed beds is untested and lacks the evidential base to enable the local planning authority to conclude, beyond reasonable scientific doubt, that the proposed development would not have a significant adverse effect on the integrity of the River Wye SAC.

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This view was shared by the Environment Agency's expert officer who examined the reed bed proposal in response to the Environmental Permit application for this site.

The officer said: *"I am particularly concerned about their assertion that they can consistently achieve NH4-N in the final effluent of at or below 0.13 mg/l. Certainly, vertical flow reedbeds are design of choice when construction wetland to maximise nitrification rates. However, my own research experience and reading on this subject makes me surprised that someone would claim such a consistently low concentration of NH4-N in the effluent...I cannot see any evidence in the assessment of how they justify such a claim..."*

"I am also concerned about any claims for a reedbed system removing phosphates. Yes, consistent rates of P removal may be achievable in the early years of the operation of a reedbed system. However, P removal will be mainly by absorption and similar processes and binding sites may quickly become saturated and thence P removal rates will inevitably decline over time. As this happens, there may also be a seasonal net emission of P from such a system."

(Appendix 1)

IN-COMBINATION ASSESSMENT

The emissions modelling report advises that Natural England's Senior Office for Sustainable Development at the West Midlands had advised that *"development already in operation should not be considered in the scope for the assessment, and this is because their effects would already have been considered in baseline studies."*

It is likely that the author of the report misunderstood the advice, because the baseline is never up to date. As the report acknowledges the Air Pollution Information System (APIS) data used as the baseline in the report is the mean of 2020-2022. APIS advises that this will account for development up to the end of the mid-year, so any development that commenced after December 2021 should have been included in the in-combination assessment.

This is the relevant APIS guidance:

"APIS concentration and deposition data is updated annually as a three-year average to account for variation in precipitation and temperature between years. When considering whether a specific emission source would be included in this, it is important to understand when the emission source began operation or was given permission. Emission sources could be included both via the measurement network and also the spatial mapping we do with the national model as that includes emissions from the National Atmospheric Emissions Inventory (NAEI) <https://naei.beis.gov.uk/data> (this is done yearly). Typically, emission sources are considered to be in APIS background if they were operational by 31 Dec of the mid year within the three-year average dataset."

<https://www.apis.ac.uk/FAQ>

The report disregards permitted development on the grounds that this is screened out of ammonia assessment. This is not correct: where there may be a significant impact on a protected site, assessment is required by Regs 75-78 of the Conservation of Habitats & Species Regulations 2017.

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The JNCC Guidance on Decision-making Thresholds for Air Pollution seeks to ensure that development that falls below screening thresholds is taken into account in air quality modelling, by applying screening thresholds based on development pressure. The Guidance has not been cited or followed in the Applicant's modelling report.

<https://data.jncc.gov.uk/data/6cce4f2e-e481-4ec2-b369-2b4026c88447/JNCC-Report-696-Main-FINAL-WEB.pdf>

MARCHES PLANNING

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