Cyfoeth Naturiol Cymru
Natural Resources Wales

Natural Resources Wales permitting decisions

Llwyngwilym Farm Poultry Unit

Decision Document

Refusal of a new bespoke permit application

We have decided to refuse the application for a new bespoke permit for Llwyngwilym Farm Poultry Unit operated by H.B.J Farms.

The application reference number is PAN-013903.

The Applicant is Mr Jake Powell, Mr Ben Powell and Mr Howell Powell trading as H.B.J Farms.

The proposed facility location is Llwyngwilym Farm Poultry Unit, Llwyngwilym Farm, Rhayader, Powys, LD6 5NS.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements.

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account

Structure of this document

- Table of contents
- Key issues and reasons for refusal
- Annex 1 The consultation response

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Key issues and reasons for refusal

The key issues in this determination included:

- Proposed emissions of ammonia to air
- Potential Impact on Habitats sites and Special Sites of Scientific Interest (SSSI)

We have refused this application because the information provided by the Applicant did not demonstrate that the proposals would not have an adverse impact on the River Wye Special Area of Conservation (SAC) or that there will be no likelihood of damage to the River Wye (Upper Wye) and Upper Nantserth Pasture Sites of Special Scientific Interest (SSSI).

See summary of what the application proposed in Section 1 below. For an outline of how we made our decision please see Section 3 with a detailed explanation of reasons for refusal in Section 7.1 and 7.2.

1. Outline of application

The Applicant proposed two new poultry sheds with a capacity for 110,000 broiler birds (55,000 broiler birds in each shed).

This would constitute as a regulated facility which is an installation comprising of the following activity listed in Part 2 of Schedule 1 to the Environmental Permitting Regulation:

- Section 6.9 A(1)(a) - Rearing of poultry or pigs intensively in an installation with more than 40,000 places for poultry.

The birds are proposed to be grown up to between 35 to 38 days with an average cycle of 36 days with an empty period at the end of each cycle for cleanout and preparation of the building for the incoming flock. The units are proposed to operate with approximately 7.5 flocks per year.

The proposal included an air scrubbing system on each shed for odour and ammonia control. The buildings are proposed to be heated using energy from an on-site aerobic digestor and in case of emergencies, back up gas heaters.

Litter would not be stored at the installation site. It would be transported off site and incorporated on the land owned by the business.

The farm already operates a free-range egg laying facility for 24,000 birds.

2. Our decision

Based on the information currently available to us we are refusing the application.

The reason for refusal is that the Applicant has not demonstrated that there will be no adverse impact on the River Wye SAC or that there is no likelihood of damage to the features of the Upper Nantserth Pasture SSSI or River Wye (Upper Wye) SSSI as a result of the ammonia emissions to air associated with the proposal. Please see section 7.1 and 7.2 for our full assessment of the impacts of ammonia to air on protected sites and further reasoning for the refusal.

3. How we made our decision

3.1. Receipt of Application

The application was received on 20/04/2021 and was duly made as of 13/10/2021 following the receipt of additional information. This means we considered it was in the correct form and contained sufficient information for us to begin us determination, but not that it necessarily contained all the information we would need to complete the determination.

No claim for commercial or industrial confidentiality has been made. We have not received information in relation to the application that appears to be confidential in relation to any party.

3.2. Consultation on the Application

We carried out consultation on the application in accordance with the Environment Permitting Regulations (EPR), our statutory Public Participation Statement (PPS) and our Regulatory Guidance Notes.

We advertised the application by a notice placed on our website, which contained all the information required by the EPR/IED, including advising people where and when they could see a copy of the application. The consultation started on 22/10/2021 and ended 19/11/2021**.**

A copy of the application and all other documents relevant to our determination (see below) were made available for the public to view. Anyone wishing to see these documents could arrange for copies to be made.

We sent copies of the application to the following bodies, which includes those with whom we have “Working Together Agreements”:

- Food Standards Agency
- Health and Safety Executive
- Public Health Wales
- Powys County Council - Planning Department
- Powys County Council - Environmental Health

Following advice from the Food Standards Agency, we also consulted with the Animal and Plant Health Agency.

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly.

No responses were received.

3.3. Requests for Further Information

In order for us to be able to consider the application duly made, we needed more information. We requested the following:

- A National Grid Reference for the site
- Confirmation of the Directly Associated Activities
- Clarification regarding the emission points

- A Site Plan
- Further information regarding the Biomass Boiler
- Clarification regarding approach to assessing the 'Upper Wye Tributaries SSSI' in the ammonia assessment
- A Drainage Plan
- A Manure Management Plan
- A revised 'Non-technical Summary'

Upon receipt of this information, we were able to consider the application Duly Made.

There were informal requests for information from the Applicant during determination via e-mail. We asked for the Site Condition Report to be revised and clarification on aspects of the drainage plan submitted with the application.

Further information was also requested by way of 2 Schedule 5 Notices:

- The initial Schedule 5 Notice requested the Applicant to provide an in-combination assessment which considers the combined impact of ammonia emissions from the proposal and all other relevant plans and/or projects on the National Site Network[1] within 5km of the proposal. This was sent on 15/12/2021.
- On 01/02/2022, Schedule 5 Notice 2 was sent which required the Applicant to also provide updated ammonia modelling and risk assessment.
- The Applicant was given until 01/03/2022 to provide all the requested information (from both Schedule 5 Notices).

Additional information was provided on 04/03/2022 but this was not considered to satisfy the requirements of the Schedule 5 Notice. Following further discussions, a final response to the Schedule 5 Notice was received on 28/06/2022. Please see section 7.2 for more information.

A copy of the information notices and e-mails requesting further information were placed on our public register as were the responses when received.

[1] Formally referred to as Natura 2000 sites

4. The Legal Framework

The application is subject to the Environmental Permitting Regulations (England and Wales) 2016 (EPR). The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the Industrial Emissions Directive (IED);
- subject to aspects of the Well-Being of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016 which also have to be addressed.

We address the legal requirements directly where relevant in the body of this document. NRW is satisfied that this decision is consistent with its general purpose of pursuing the sustainable management of natural resources (SMNR) in relation to Wales, and applying the principles of SMNR. In particular, NRW acknowledges that it is a principle of sustainable management to take action to prevent significant damage to ecosystems. We consider that, in refusing the permit application for the reasons explained within this document, a high level of protection will be delivered for the environment and human health.

5. The Site and its protection

The site is within a sloping grassland field around 900 metres to the south-west of the existing farmstead. Llwyngwilym lies within a rural area approximately 850 metres from edge of the town of Rhayader.

The Applicant has provided site plan which we consider is satisfactory, showing the location of proposed poultry units, emission points and site boundary.

5.1 Assessment of site baseline condition report

The Applicant has provided a Site Condition Report with the application. There are no noted pollution incidents or historical land uses known which may have effected this land previously. The Site Condition Report originally submitted with the application only had sections 1 and 2 completed. The Applicant provided an updated report with section 3 completed on 06/12/2021. We considered this satisfactory. This decision was taken in accordance with our guidance on site condition reports – guidance and templates (H5).

5.2 Proposed site design: potentially polluting substances and prevention measures

The Applicant has confirmed that fuel and oil storage facilities would be bunded and that the bunds would meet the requirements of the Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) Regulations 2010 (SSAFO Regulations). Should the permit have been issued, the facility would also be required to have complied with the Water Resources (Control of Pollution) (Silage & Slurry) (Wales) Regulations 2010 where relevant. The Applicant also confirmed that the storage facilities will be regularly inspected.

We considered this satisfactory. This decision was taken in accordance with Sector Guidance Note: How to comply with your environmental permit for intensive farming EPR 6.09.

6. Operation of the Installation – general issues

6.1. Administrative issues

The Applicant would be the sole Operator of the Installation. We are satisfied that the Applicant is the person who will have control over the operation of the Installation if the Permit was to be granted; and that the Applicant would have be able to operate the Installation so as to comply with the conditions included in the Permit, if issued.

6.2. Environmental management system

There is no known reason to consider that the Applicant would not have the management systems to enable it to comply with a permit, if issued. The decision was taken in accordance with RGN 5 on Operator Competence.

6.3. Relevant Convictions

NRW's COLINS Database has been checked and no relevant convictions were found.

6.4. Accident Management

The Applicant has provided an accident risk assessment and management plan with the application. This details likely accident hazards and the measures which will be put in place in order to reduce the risk of pollution should an accident occur. We consider this satisfactory. This decision was taken in accordance with Sector

Guidance Note: How to comply with your environmental permit for intensive farming EPR 6.09.

6.5. Site security

Having considered the information submitted in the application, we are satisfied that appropriate infrastructure and procedures would have been in place prior to start up to ensure that the site remains secure.

6.6. Operating techniques

We have reviewed the techniques proposed by the Applicant and compared these with Sector Guidance Note: How to comply with your environmental permit for intensive farming EPR 6.09 and consider them to represent appropriate techniques for the facility.

6.7. Energy efficiency

We are satisfied that the Applicant will ensure that energy is used as efficiently as possible. This decision was taken in accordance with Sector Guidance Note: How to comply with your environmental permit for intensive farming EPR 6.09.

6.8. Avoidance, recovery or disposal of wastes produced by the activities

The Applicant has confirmed that all manure produced would be exported outside of the installation's site boundary.

All carcasses will be disposed of in accordance with the current Animal By-Products Regulations. They would be stored in sealed vermin proof containers awaiting regular collection by a licenced renderer. Records of dates, quantities and destination will be held on site.

Dirty water collected in underground tanks will be removed by tanker and used appropriately on the farm.

We are satisfied that waste avoidance, recovery and disposal would have been satisfactory. This decision was taken in accordance with Sector Guidance Note: How to comply with your environmental permit for intensive farming EPR 6.09.

7. Minimising the Installation's environmental impact

Regulated activities can present different types of risk to the environment. These can include odour, noise and vibration; accidents, fugitive emissions to air and water; as well as point source releases to air, water, sewer and discharges to ground or groundwater and generation of waste. All these factors are discussed in this and other sections of this document.

For an installation of this kind, the principal emissions are:

- Emissions to air
- Emissions to water
- Odour
- Noise
- Fugitive emissions

The next sections of this document explain how we have approached the critical issue of assessing the likely impact of emissions from the Installation on human health and the environment.

7.1. Impact on Habitats sites, SSSIs and non-statutory conservation sites

The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected habitat.

National Site Network, SSSIs and non-statutory conservation sites will be discussed separately below.

National Site Network

The following Nature 2000/Ramsar sites are located within 5km of the installation:

- Elan Valley Woodlands SAC
- River Wye SAC
- Elenydd-Mallaen SPA

A Habitat Regulations Assessment **(**HRA**)** was completed to assess the potential of the proposal to affect these sites and a summary is given below (full details can be found on the Form 1).

As discussed, the proposal includes the use of an ammonia air scrubber, and this has been assessed in the HRA as an incorporated mitigation measure proposed by the Applicant.

Assessment of Likely Significant Effect:

The project has been screened for likelihood of significant effects and demonstrated no impact to the sites identified via the following impact pathways:

- Physical damage
- Smothering
- Changes in salinity regime
- Changes in thermal regime
- Turbidity
- Siltation
- Entrapment

However, the principle emission from the proposal is ammonia to air. It was determined that the project is likely to have a significant effect on the National Site Network from the following impact pathways:

- Toxic contamination (via increased atmospheric concentrations of ammonia)
- Nutrient Enrichment (via nitrogen deposition, a direct impact of increased atmospheric ammonia)
- Acidification (via changes in pH, a direct impact of increased atmospheric ammonia)
- Habitat loss (as a result of toxic contamination, nutrient enrichment acidification)

Therefore, an appropriate assessment was required.

Appropriate assessment:

The appropriate assessment was completed using the air modelling and assessment provided by the Applicant. This modelling and assessment was audited by NRW.

It was determined that there was no anticipated impact on the conservation objectives for two of the three sites under consideration as listed above, these being:

- Elan Valley Woodland SAC
- Elenydd-Mallaen SPA

This was where the Applicant modelled the impact of the predicted emissions of ammonia, impact was concluded to be insignificant and NRW agreed with this conclusion. See full HRA Form 1 and section 7.2 for more detail.

However for the River Wye SAC the conservation objectives state that the ecological status of this watercourse is a major determinant of favourable conservation status for all the site's features. Changes in water quality as a result of nitrogen deposition and acidification (indirect pathways resulting from increased atmospheric ammonia emissions) can impact the ecological status and hence the site's features.

The Applicant's modelling concluded that impacts from ammonia emissions at the River Wye SAC to be insignificant. However, NRW do not agree with this conclusion for reasons detailed within the assessment and section 7.2 of this report. Therefore, it could not be ascertained that the project will not adversely impact the SAC's features following the assessment of the predicted ammonia emissions in view of the conservation objectives.

In light of the conclusions of an appropriate assessment and taking account of the advice received from protected sites advisors, it has not been ascertained that the project will not adversely affect the integrity of any Nature 200/Ramsar site.

HRA Overall conclusion:

In light of the conclusions of the appropriate assessment, it has not been ascertained that the project will not adversely affect the integrity a site which forms part of the National Site Network, as documented in section 4 of OGN 200 Form 1. Therefore, we must refuse the permit application.

Form 1 (and Form 2) – saved on DMS as "to be assessed" for public register purposes (dated 04/10/2022)

As this assessment concluded that it cannot be ascertained that the proposal *alone* will not adversely affect the integrity the National Site Network, there is no requirement to consider in-combination impacts. There are however other sources of ammonia in the vicinity of the proposed installation which have been identified by the Applicant which may act in-combination. Should this assessment have concluded no impact alone, it is likely that the assessment would have concluded there to be an adverse effect on site features from in-combination effects. Note that this impact has not been quantified adequately by the Applicant (as discussed in section 7.2) and NRW have not requested further information where it is not needed to inform the HRA assessment.

SSSI Assessment

The following Sites of Special Scientific Interest (SSSI) are located within 5km of the installation:

- Marcheini Uplands, Gilfach Farm & Gamallt SSSI
- River Wye SSSI
- Rhos Rhyd-y-ceir SSSI
- River Wye (Upper Wye) SSSI
- Upper Wye Tributaries SSSI
- Cwm Gwynllyn SSSI
- Elenydd SSSI
- Coed y Cefn SSSI
- Cerrig-gwalch SSSI
- Caeau Wern SSSI
- Carn Gafallt SSSI
- Cae Cwm-bach SSSI
- Cae Coed-gleision SSSI
- Black Brook Pastures SSSI
- New House Meadow SSSI
- Upper Nantserth Pasture SSSI

An Appendix 4 Form was completed to assess the potential of the proposed installation to effect these sites, a summary is given below.

The assessment was completed using the air modelling and assessment provided by the Applicant and NRW's internal air quality specialists audit of this modelling.

At all sites apart from:

- Upper Nantserth Pasture SSSI and;
- River Wye (Upper Wye) SSSI,

the proposed permission was determined to not be likely to cause damage. This was where the Applicant modelled the impact of the emissions of ammonia, impact was concluded to be insignificant and NRW agreed with this conclusion. See full assessment and section 7.2 for more detail.

The Applicant's modelling concluded that impacts from ammonia emissions at

- Upper Nantserth Pasture SSSI and;
- River Wye (Upper Wye) SSSI,

to also be insignificant. However, NRW do not agree with this conclusion for reasons detailed within the assessment and section 7.2 of this report. Therefore, it could not be ascertained that the project is not likely to damage the site's features following assessment of the predicted ammonia emissions.

The assessment was sent for consultation and the protected sites advisor responded confirming their agreement with the outcomes of the assessment and advised that the proposal should not go ahead.

The application for a permit must therefore be refused.

Appendix 4 - saved on DMS as "to be assessed" for public register purposes (dated 14/10/2022).

Non Statutory Sites Assessment

The Applicant has identified 2 sensitive Ancient Woodland sites within 5 km of the proposed installation and has identified that these are located at National Grid

Reference (NGR) SN 98041 67445 (“AW1”) and SN 98909 67922 (“AW2”), approximately 2 km Southeast from the proposed shed locations.

The only impact pathway to these sites from the proposal is emissions of ammonia to air.
NRW’s open data maps[2] indicates there are more Ancient Woodland sites sensitive to ammonia within 5km of the proposal which have not been specifically assessed by the Applicant. However, the majority of these sites overlap with SSSI’s which have been assessed by the Applicant and impact has been determined to be insignificant. Those which do not directly overlap with a SSSI are located further away than receptor points at which impact has been deemed to be insignificant.

Full details of the Applicant modelling and NRW’s audit of this modelling are discussed in section 7.2 below. Of the sites identified by the Applicant, it was correctly identified that background levels of ammonia are already exceeding the relevant critical level of 1µg/m^3 (1.5µg/m^3). However, the Applicant’s modelling indicates that PC is less than 1% (at 0.24% and 0.25% for AW1 and AW 2 respectively) of the critical level at both sites and impact can be screened out as insignificant in line with current guidance[2]. NRW agree with this conclusion.

7.2 Assessment of Impact on Air Quality

The principle pollutant emitted to air from Intensive Farming installations is ammonia. Ammonia critical levels are used as a standard to ensure sensitive sites are protected and sustainable development is enabled.

The relevant guidance[3] for assessing the impact of farming activities on air quality advises ammonia “Process Contribution” (PC) (i.e., amount of ammonia that will be emitted from the development) should be determined and provided as a percentage of the identified sensitive sites Ammonia critical level.

If it can be shown that:

[2] View open data on access, flood, habitats, hydrology, landscapes, marine, designated land, water quality, and woodlands (arcgis.com)
[3] Natural Resources Wales / How to interpret the results from your screening or modelling exercise for Ammonia Emissions (GN 020)

- When PC plus the background levels of ammonia at all relevant sensitive sites does not exceed the critical level and;
- there are no other sources of ammonia to consider

then no detailed modelling is required, and the application can progress.

However, if:

- PC plus background levels of ammonia at a sensitive site exceeds the critical level or;
- there are other sources of ammonia to consider

then detailed modelling is required.

If detailed modelling shows that PC is below 1% of the relevant critical level and there are no other sources of ammonia to consider, the application can proceed regardless of background level (providing there are no other sources of ammonia to consider).

However, if PC plus background levels of ammonia reaches or exceeds the critical level and PC is over 1% of that critical level then abatement must be used to reduce the PC to below 1% in order for the application to proceed.

This original assessment provided with the application was completed in line with *'OGN 41 Assessment of ammonia and nitrogen impacts from livestock units when applying for an Environmental Permit or Planning Permission' and 'GN020 Assessing the impact of Ammonia and Nitrogen on Designated Sites from new and expanding livestock units'* which was withdrawn during the determination of the application (May 2021). This guidance had slightly different requirements to that discussed above. The main difference is that under current guidance, background levels and other sources of ammonia need to be considered in all cases at the start of the assessment, whilst in the withdrawn guidance this was only a requirement where detailed further assessment was required.

The modelling was assessed by internal NRW air quality specialists who advised re-modelling was required. This was because:

- The modelling was based on an emission factor for broilers of 0.034 kg NH^3/animal/year (in line with the standard Ammonia emission factor outlined in

our guidance[4]) but had been adjusted for an assumed ammonia removal efficiency of the proposed air scrubber (IPT VentMax 1200) of 90%. It was acknowledged that performance data for the proposed scrubber does indicate an ammonia removal efficiency between 76% and 100% (92% average) but this data did not indicate how the removal efficiency has been calculated. Despite NRW contacting the supplier for validation / study data, no response was received.

- The assessment stated the abatement factor used *"is consistent with other applications approved by NRW"*. However, NRW does not currently have a de facto policy of accepting a 90% reduction in ammonia emissions when scrubbers are installed.
- The performance data for the proposed scrubber specifies a maximum outlet emission concentration of 2 ppm. The modelling undertaken for the previous planning application linked to this proposal (for 55,000 birds in one shed) was based on this specified maximum outlet concentration and this is the approach we advise to be suitable for this application for the purposes of risk assessment.
- The modelling also focused on emissions from the 'proposed' shed (55,000 birds). Although this might be appropriate for the application for the variation to the existing planning permission, for the purposes of this EPR environmental permit application the entire installation needed to be assessed (i.e., 110,000 birds across 2 sheds).
- Check modelling, using 2017 to 2021 NWP metrological data and emission rates derived from the maximum outlet emission concentration (2 ppm) at the maximum ventilation rate, resulted in higher maximum PC's than that predicted by the Applicant. Notably, PC exceeded 1% of the relevant critical levels (and loads) at a number of the designated sites in the vicinity. Under the guidance the application was originally submitted under, this meant further assessment was required.

The full audit report is saved to DMS dated 24 January 2022.

[4] Natural Resources Wales / Emission factors for poultry for modelling and reporting

As this modelling was deemed to be insufficient for the purposes of risk assessment during determination, it's results will not be discussed in detail in this report.

A Schedule 5 Notice information request was sent to the applicant on 01/02/2022 requesting that ammonia emissions were re-modelled to assess the impact from both sheds, using an emissions rate which is based on the proposed scrubber specified maximum outlet concentration (2 ppm). It was asked that this modelling and assessment was completed in line with current guidance[2], considering both background levels and other sources of ammonia (i.e., an in-combination assessment).

Following a number of meetings and further correspondence between NRW and the Applicant regarding the requirements of the re-modelling, an updated assessment was provided on 28/06/2022.

The updated modelling and assessment considered 3 different scenarios:

- Scenario 1 ("Approved"): 1 shed housing 55,000 broilers which is representative of the activity which already benefits from planning permission (but not an environmental permit). Not yet constructed.
- Scenario 2 ("Proposed"): 1 "new" shed housing 55,000 broilers which is representative of the aspect of the proposal which does not benefit from planning permission
- Scenario 3 ("Combined"): 2 sheds housing 110,000 broilers

For the purpose of this EPR permit application, only Scenario 3 is relevant as it is representative of what is being applied for.

The updated modelling has been reviewed by NRW's air quality modelling specialists. Please see below for discussion of the assessment's conclusions and detailed comments from the internal audit.

The modelling was undertaken using BREEZE AERMOD software and included the effects of buildings and terrain on dispersion. Ammonia emissions have been modelled using 5 years (2015-2019) of meteorological data from the Met Office's Sennybridge

monitoring station, 40km from the proposed installation. This data was used as it was considered to be at a location with similar topographical characteristics and altitude. NRW agree with this approach in this instance. However, results in the Applicant's assessment have been presented as an average of the individual yearly average concentrations over the five metrological years modelled, rather than the maximum average annual process contribution modelled. Current guidance[5] recommends that each year of meteorological data should be run separately and the highest predicted annual result from the 5 years should be used as the basis of the assessment.

The updated assessment was based on using an INNO+ scrubbing system (or equivalent) on each shed rather than a IPT VentMax 1200 scrubbing system (or equivalent). This was due to difficulties in sourcing the original proposed scrubber.
It is expected that the scrubbers will provide the majority of the sheds ventilation requirements and that back up ventilation in the event of scrubber failure or during hot weather will be provided by ridge mounted fans.

The mass emission rates from each shed used in the supplied modelling are based on a total annual ventilation requirement of 591,049,609 m^3/year or approximately 67,471 m^3/hr with scrubbing capacity exceeded for no more than 2.8% of operational days per year. This has been derived from the annual ventilation regime obtained from a confidential surrogate site although no additional information regarding the surrogate site has been provided by the consultant (e.g., location, number of birds, manure management regime, presence/absence of ammonia abatement etc.). However, the total annual ventilation volume using this approach exceeds that predicted using alternative approaches previously accepted by NRW and therefore is considered suitable in this instance.

Emission rates for ammonia from each INNO+ scrubber were calculated using ammonia concentrations in scrubbed air during manure removal specified in the DLG Test Report[6] for the Inno+ scrubbing unit and have been modelled with a constant velocity assuming a total ventilation rate approximately equal to the maximum capacity

[5] Natural Resources Wales / How to carry out detailed modelling of ammonia emissions (GN 036)
[6] DLG e.g. Test Centre Technology and Farm Inputs (2019) "Inno+ B.V. Inno+ Pollo-M 1-stage chemical air cleaner with droplet separator for broilers". DLG Test Report 6260

of the scrubber unit i.e., 120,000m^3. However, the calculated velocity for each scrubber outlet stack detailed in the Applicants report, which has been based on the actual ventilation requirements, is less (by approximately 50%) than the velocity used in the submitted modelling. The increased velocity used in the submitted modelling may therefore result in reduced PC predictions at receptors relative to modelling predictions using the velocity derived from the stated volume of scrubbed air in the submitted report. Check modelling indicated that like for like comparisons using submitted modelling files resulted in an increase in predicted impacts at the majority of receptors when using the reduced velocity based on submitted volumetric flow through the scrubbing units of between 2% to 18% at the River Wye SAC with a maximum of 26% increase at the Upper Nantserth Pasture SSSI.

Ammonia emission rates from the proposed INNO+ scrubber units in the submitted modelling files were calculated using both the mean specified outlet concentration in scrubbed air (0.7 ppm) and the percentage ammonia removal efficiency from scrubbed air of 91% as detailed in the INNO+ DLG test report[6] applied to the standard emission factor for broiler ammonia emissions of 0.034 kg-NH3/animal place/year.

Results in the submitted report have been presented from the modelling run using the 91% removal efficiency which is representative of the lowest calculated emission rate. Using the percentage removal efficiency is contrary to advice given to the Applicant whereby it was advised that the maximum specified outlet concentration as detailed in the proposed scrubbers DLG certification test report should be used (0.9 ppm) or the mean specified outlet concentration (0.7 ppm) with suitable justification.

We consider it more appropriate to use the maximum specified outlet concentration as opposed to the ammonia removal efficiency where the DLG INNO+ testing regime used a shed containing 39,000 broilers (maximum thinning/finishing weigh of 1.9/2.71 kg/bird). The proposed sheds in this installation are proposed to hold 16,000 more birds per shed. We would therefore anticipate the Applicant to opt to use the most conservative approach to the modelling, which in this case would be using the maximum specified concentration outlet of the scrubber proposed.

It is noted that the Applicant did provide additional sensitivity modelling based on the mean specified outlet concentration data from the DLG certification test report (0.7ppm) in Appendix C of the submitted report. However, this was only completed for Scenario 2 (“Proposed”) and presenting the average of the annual averages over the five modelled years rather than the maximum predicted annual average, Therefore, these results cannot be used for the purpose of this risk assessment.

The modelling calculated PC from the proposed installation at sensitive sites identified within 5km:

- Upper Nantserth Pasture SSSI
- Coed y Cefn SSSI
- Marcheini Uplands, Gilfach Farm & Gamallt SSSI
- Rhos Rhyd-y-Ceir SSSI
- Cwm Gwynllyn SSSI
- River Wye (Upper Wye) SSSI
- Cerrig-Gwalch SSSI
- Carn Gafallt and Elenydd SSSI
- Caeau Wern SSSI
- New House Meadow SSSI
- Cae Coed Gleision SSSI
- Cae Cwm-bach SSSI
- Black Brook Pastures SSSI
- Elenydd-Mallaen SPA
- River Wye SAC
- Elan Valley Woodlands SPA
- 2 x sensitive Ancient Woodlands

PC at each of these sites has been provided as a percentage of the relevant critical level.

The applicant has correctly identified that background levels are exceeding at the following sites all of which all have a critical level of 1 µg/m^3:

- Upper Nantserth Pasture SSSI (1.3 µg/m^3)

- Coed y Cefn SSSI (1.3 µg/m^3)
- Marcheini Uplands, Gilfach Farm & Gamallt SSSI (1.3 µg/m^3)
- Cwm Gwynllyn SSSI (1.3 µg/m^3)
- River Wye (Upper Wye) SSSI (1.5 µg/m^3)
- Cerrig-Gwalch SSSI (1.1 µg/m^3)
- Carn Gafallt and Elenydd SSSI (1.4 µg/m^3)
- Elenydd-Mallaen SPA (1.4 µg/m^3)
- River Wye SAC (1.5 µg/m^3)
- Elan Valley Woodlands SPA (1.3 µg/m^3)
- 2 x sensitive Ancient Woodlands (1.5 µg/m^3)

The assessment concluded that when considering results for Scenario 3, PC from the proposed installation was below 1% of the relevant critical level at all sites apart from Upper Nantserth Pasture SSSI where it was predicted to be 1.85%. As background levels at this site are already exceeding the critical level, the Applicant has correctly identified that impact at this site cannot be regarded as insignificant.

NRW have completed check modelling which has resulted in higher maximum predicted PC at all habitat receptors. These results indicate that the 1% threshold will be exceeded at the following sites:

- Upper Nantserth Pasture SSSI – check modelling indicated PC would represent 5.4% of the critical level as opposed to 1.85% as calculated by the Applicant
- River Wye SAC / River Wye (Upper Wye) SSSI – check modelling indicated PC would represent 1.8% of the critical level as opposed to 0.73% as calculated by the Applicant

Reasons why NRW's check modelling may result in higher PC values include:

- The Applicant's assessment present results as an average of annual means over 5 years of metrological data rather than the year of maximum impact as advised in our guidance and used in the check modelling.
- The velocity used in the Applicant's modelling is 50% less than the calculated velocity in the assessment's report which was used in the check modelling.

- The Applicant's results have been based on an ammonia removal efficiency of 91% applied to the standard emission factor for broilers of (0.034 kg-NH_3/animal/place/year). NRW's check modelling has been calculated using the maximum specified outlet concentration data (0.9ppm) as detailed in the scrubber's certification report which is considered more appropriate for the purposes of a conservative risk assessment in this instance for reasons discussed above.

They Applicant identified the following additional sources of ammonia in the vicinity of the proposed installation:

- Ffosmascal:
  - planning permission application for 5,000 free range broilers (reference 21/2308/REM)
  - pending consideration' at time of writing
- Llwyn Cutta Poultry Unit:
  - planning permission application for a free ranger broiler chicken unit (reference 21/0263/FUL)
  - 'pending' decision at time of writing
- Dol Y Garref:
  - planning permission for pullet rearing unit (reference: P/2017/1437)
  - status 'unknown' although thought to have been granted on 24/05/2018 and constructed by September 2020
- Neuaddfach
  - planning permission for free range poultry unit granted 17/09/2020 (reference: P/2017/1116)
  - approved 17/09/2020

We have reviewed the sites identified and agree they are relevant additional sources of ammonia which need to be considered. However, the Applicant has only considered the individual impacts of each of these sources on the Upper Nantserth Pasture SSSI. The assessment has not quantified/presented impacts of emissions from these sites in-combination with the proposed installation at the other sensitive sites identified.

The assessment does acknowledge potential impact of the proposed installation when considered alongside the existing background levels and other sources of ammonia in the conclusions:

"It is recognised that as the total PEC (proposed shed + approved shed + in-combination sites+ background) is above 1% at designated sites an appropriate assessment will need to be completed by the competent authority in order to determine whether the impact will result in a significant impact at any site and therefore the development will conflict with the conservation objectives of that site."

As forementioned, if detailed modelling predictions show that PC plus background levels of ammonia reaches or exceeds the critical level and PC is over 1% of that critical level, abatement must be used to reduce the PC to below 1% in order for the application to proceed. The Applicant's modelling already includes the use of mitigation in the form of air scrubbers and no additional mitigation has been proposed following the results of the modelling.

Furthermore, the role of NRW as the competent authority is not to determine if the impact from a proposal will 'result in a significant impact' but instead to be satisfied that the proposal will not adversely affect the integrity of the sites identified.

A HRA has been completed by NRW using the results of the Applicant's modelling and NRW's air quality specialist audit comments and check modelling results. This assessment has concluded that, based on this information provided with the application, it could not be ascertained that the project will not adversely affect the integrity of the River Wye SAC. Furthermore, as described above, the assessment of impact at Upper River Wye SSSI and Upper Nantserth Pastures SSSI has determined there to be a potential for likelihood of damage.

As a result, the application for a permit is refused.

7.3. Assessment of impact to surface and ground water

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent pollution of surface and ground water.

Clean uncontaminated water from the roof sheds will be diverted (via down pipes) to rainwater harvesting tanks. Overflow from these tanks, other roof water and clean water from yard areas will drain to stone infiltration trenches. Un-infiltrated water from these trenches will discharge to an-named tributary of the River Wye.

Contaminated water will be collected in 2 twin walled underground storage tanks. This will include drainage from the poultry units and water from yards contaminated by litter or wash down.

7.4. Assessment of odour impact

The Environment Agency's H4 Odour Management Guidance is widely accepted and used in regulatory odour impact assessments. NRW has adopted this guidance. As set out in the guidance, the modelling method commonly used in the UK calculates a 98th percentile of hourly average odour concentrations over a year. The results are expressed as odour units.

Odour unit values are determined by a standard method given in; BS EN13725; 2003 Air quality. Determination of odour concentration by dynamic olfactometry. One odour unit, OUE/m^3 (European Odour Unit per meter cube of air) is the point of detection.

The exposure benchmarks are:

- 1.5 odour units for most offensive odours;
- 3 odour units for moderately offensive odours;
- 6 odour units for less offensive odours.

Odours from poultry rearing are usually placed in the moderately offensive category. Therefore, the benchmark of 3 OUE/m^3 has been used to assess the potential impact of odour on nearby sensitive receptors. The applicant submitted an Odour Air Dispersion Modelling report using an AERMOD model.

Two scenarios were considered:

- Existing free range laying facility for a maximum of 24,000 birds
- Proposed broiler facility for a maximum of 110,000 sheds in two units

For the purpose of this application, our assessment has focused on the second scenario.

The emission rates used are calculated from an internal concentration of odour taken from published values which indicate a likely range for a well-run modern farm of 300ouE/m3 – 2300 OUE/m^3 across a 36 day growth cycle. The emissions rates are time varying throughout the cycle and for the purpose of the modelling the peak emission rates have been used (i.e. end of the cycle during clean out).

Process contribution has been calculated using a 40% abatement rate due to the emissions being from scrubbers from each shed.

The modelling assessed the impact on 8 receptor location which represent the closest residential buildings to the site using meteorological data from 2015-2019.

This assessment concluded that for the proposed new broiler facility, out of the 8 odour receptors identified, none breached the benchmark of 3 OUE/m^3 with odour impacts predicted to be low for all years modelled. The highest impact was predicted as being 0.71 OUE/m^3 (receptor D5, 2018).

As there are receptors within 400 metres of the installation, the applicant has described a detailed series of measures that will be put in place to minimise odour emissions in the odour management plan. They have identified potential sources of odour, including:

- Aerobic and anaerobic microbial activities within the litter and from the animals
- Broiler litter which can be influenced by moisture content, pH, temperature, bird activity, litter type, bird diet
- Carcass storage and disposal
- General housekeeping (spillages, dirty water etc)

The odour plan details various measures to mitigate odour issues including:

- Selecting feed with optimal protein and amino acid balances depending on production stage of the bird. Feed will be purchased from Agricultural Supply Trade Association (UKASTA) accredited feed mills.
- Feed delivery systems are sealed to minimise atmospheric dust and any spillage of feed around the bin is immediately removed
- Controlling poultry litter quality with controlled temperature and ventilation and managing the moisture content of the litter (by using methods such as providing drinking water via nipple feeders and insulating walls to prevent condensation).
- Building ventilation will be reduced to a minimum during the cleanout phases and clean out will be avoid during adverse climate conditions which may increase odour impact
- Carcasses will be collected from the sheds daily, stored in sealed vermin proof containers and regularly collected by a licensed agent.

We have compared the measures proposed to minimise odour at for the site to the BAT standards in Sector Guidance Notice 'How to Comply with your Permit for Intensive Farming' EPR 6.09. and are satisfied that the techniques represent appropriate measures for the installation following this variation.

Based upon the information in the application we are satisfied that the appropriate measures would have been put in place to prevent or where not practicable to minimise the effects of odour should the permit have been issued.

7.5. Noise Assessment

There are sensitive receptors within 400 metres of the installation. The Applicant has submitted a Noise Management Plan (NMP) for the installation as required by Sector Guidance Notice 'How to Comply with your Permit for Intensive Farming' EPR 6.09. The noise management plan identifies potential risks from the operation and describes the measures and controls that will be put place to minimise noise and vibration.

Potential sources of noise will include:

- Ventilation Fans
- Fuel and Feed Deliveries

- Feeding Systems
- Alarm Systems
- Bird Catching
- Clean Out Operations
- Maintenance and Repairs
- Set up and Placement
- Standby Generator Testing

The noise management plan includes the following risk management techniques:

- Ventilation fans will be assessed daily by the Site Manager or designated personnel and be regularly maintained
- HGV's will be limited to 10mph on site and 15mph leaving the site, be fitted with silencers and switch engines off when not in use
- Feeding systems to be inspected daily, maintained regularly and stock will be checked to prevent augers running empty
- Audible alarms should be timed to normal working hours to avoid disturbance to nearby residents. Normal working hours may be considered to be 09:00 hours to 17:00 hours.
- Set up and placement of birds and any maintenance and repair is to be carried out during normal working hours.
- Standby generators will be fully noise insulated

We have compared the measures proposed to minimise odour at for the site to the BAT standards in Sector Guidance Notice 'How to Comply with your Permit for Intensive Farming' EPR 6.09. and are satisfied that the techniques represent appropriate measures for the installation.

We are satisfied that vibration is unlikely to be an issue at the installation. The nature of the intensive farming operation means that there are no significant sources of vibration on site, therefore vibration is not required as part of the noise management plan.

Based upon the information in the application we are satisfied that the appropriate measures would have been in place to prevent or where that is not practicable to minimise the effects of noise should the permit have been issued.

7.6. Fugitive emissions

The Applicant has provided a fugitive emission plan identifying the sources of fugitive emissions and outlines how risks will be managed.

Based upon the information in the application we are satisfied that the appropriate measures would have been in place to prevent or where that is not practicable to minimise fugitive emissions and to prevent pollution from fugitive emissions should the permit have been issued.

ANNEX 1: Consultation Reponses

A) Advertising and Consultation on the Application

The Application has been advertised and consulted upon in accordance with Natural Resources Wales Public Participation Statement. The way in which this has been carried out along with the results of our consultation and how we have taken consultation responses into account in reaching our draft decision is summarised in this Annex. Copies of all consultation responses have been placed on Natural Resources Wales public register.

1) Consultation Responses from Statutory and Non-Statutory Bodies

None received.

2) Consultation Responses from Members of the Public and Community Organisations

None received.

a) Representations from Local MP, Assembly Member (AM), Councillors and Parish / Town / Community Councils

None received.

b) Representations from Community and Other Organisations

None received.

c) Representations from Individual Members of the Public

None received.

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