
From:
Sent: 26 January 2021 07:20
To: Ailsa Teasdale
Cc: Elspeth Ingleby; Planning
Subject: High Farm, Ugglebarnby - NYM/2020/0659/FL and 0660/FL

Dear Ailsa – I hope you are fit and well.

Please find attached final SCAIL report in connection with the above site for your consideration and approval.

If you are able to let us have a new determination date that would be helpful many thanks.


Kind regards

Cheryl

Cheryl Ward Planning
MSc MRTPI



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NYMNPA

26/01/2021

Ammonia Emissions Report



Promar International
response to:

R & A HARLAND

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On behalf of
R & A Harland

Private and confidential

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Section 1. Introduction

1.1 Context

Promar has been supporting R & A Harland in the preparation of an ammonia emissions report concerning the addition of a new cattle shed at High Farm.

A resultant planning application was submitted by R & A Harland to the North York Moors National Park Planning Authority on 31st August 2020. During the consultation phase, North York Moors National Park Planning Authority requested an additional assessment was necessary to determine the impact of the proposed housing on sensitive environmental receptors as a result of ammonia emissions.

1.2 Objective

The request for a further air quality assessment by North York Moors National Park Planning Authority through the National Park Ecologist identified the need to respond to the following objectives:

1. To undertake and provide a concise assessment of potential ammonia emissions for the existing and proposed housing using SCAL
2. To provide rationale for information relating to the impact of enclosing feed and cubicle areas on air quality in comparison to open straw bedded barn and feed areas

Section 2 of this report provides a comprehensive response to these questions.

Section 2. Ammonia impacts

2.1 Approach

This section of the report provides a detailed response to the questions raised by the North York Moors National Park Ecologist.

The response seeks to support the determination of the planning application and demonstrate that the new housing facility will positively contribute towards reducing environmental impacts to land, water and air.

The existing straw-based system comprises of a 540m² cattle shed with an open-air feed lot. The proposed development will replace the function of the previous management system by creating two new buildings which will envelope the existing cubicle sheds to the west of the farm steading. It will continue to function as a straw-based system including an undercover feeding area, with no planned increase in size of the dairy herd.

Dirty water¹ from the buildings will be directed to the new slurry lagoon where the wastewater will be easily (and safely) stored without impact on the farms aquatics or minimum winter storage capacity.

2.1.1 SCAIL

The information presented below sets out the assumptions used to undertake the SCAIL assessment. Promar has undertaken detailed analysis of the High Farm proposals and conducted an assessment using SCAIL for the Harland's. SCAIL is a model used to assess emissions associated with ammonia as a result of livestock housing and slurry storage.

The sources of ammonia that make up the total contribution (i.e. the Predicted Environmental Concentration include:

1. The existing background which will take account of all contributions for the period to the end of 2018 when the APIS data is used;
2. Any new sources of ammonia within the relevant screening distance since January 2019; and
3. Contributions from the SCAIL modelled source (i.e. the Process Contribution), in this case the proposed replacement shed and extension.

The planning application relates to the replacement shed and the ammonia sources such as housed animals are already at this location and **therefore encompassed within point above (the existing background level)**. The dairy herd is already included

¹ Dirty water is a technical term to describe lightly fouled surface run-off water which has been contaminated with excrement from livestock

in the background level (based on APIS data in SCAIL) and the herd size has been at its current level for over 4 years.

2.1.2 Model scenarios

The assumptions which have been applied in the SCAIL model, which has been run for both existing and proposed housing, are as follows:

Existing deep straw-based housing

- Existing deep straw-based cattle shed – designated 'straw-bedded farmyard manure loose housing' within SCAIL's limited naming options
- Surface area of 540m²
- 6m building height
- Housing 55 cows 160 days a year

Proposed straw-based housing

- Establishment of housing to replace the function of the existing cattle shed
- Straw-based cattle shed - designated 'straw-bedded farmyard manure loose housing' within SCAIL's limited naming options
- Surface area of 569.5m² (e.g. the specific area which could result in the generation of potential ammonia emissions)
- 7.05m building height
- Housing 55 cows 160 days a year

The site has 8 environmentally sensitive receptors within a 7.5 kilometre distance of the farm. These include Special Protection Areas (SPA), Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) sites. Each of these receptors has varied impacts on flora and fauna which have been considered during the modelling.

2.2 SCAIL results

Two scenarios have been prepared to present the results based on the above assumptions:

- Existing straw-based housing system.
- Proposed straw-based housing system.

Modelling results for the proposed building have been provided to the North York Moors Planning department.

2.2.1 Key findings

Table 2.1 presents the SCAIL output of source emissions from the existing and proposed housing systems for ammonia.

Table 2.1: Ammonia (NH₃) emissions generated from existing and proposed development

Status	Housing system	NH ₃ (kg)
Existing management	Deep-straw	378
Proposed management	Straw	378

The results demonstrate there is no significant change in ammonia emissions generated from the proposed development. However, the development will most likely provide betterment in terms of air and water quality for the following reasons. The farm is not increasing cow numbers, it is improving the quality of existing infrastructure. This will benefit animal health and welfare and improve cow comfort which support emissions reduction. The cleaning and management regime of the proposed building will be improved reducing risk of emitting surface area and contribute a mitigation to c. 10% reduction. Therefore, the results demonstrate it will have an insignificant impact of receptors as there is no increase in NH₃. It will provide benefits to the background level and contribute towards a reduction in nitrogen enrichment in the local environment.

2.2.2 Additional environmental benefits

The development will also provide positive benefits to environmental receptors in the catchment. Enclosing the (current) open-air feed lots will provide the opportunity to improve local air quality and water management further. The Parish Council has previously raised concerns regarding drainage from the site and diffuse pollution into the near-by beck and lane. Ensuring this feeding area is under roofed cover in the proposed housing would ensure that this volume of effluent is significantly reduced. It will also reduce ammonia emissions generated by this current management practice.

Improvements will also be made to farm infrastructure as a result of the development. For example, gutters on buildings will be maintained and directed to ensure rainwater that lands on the roofs of all buildings are diverted into the clean water system which discharges to several ditches, rather than draining into the dirty water system. Enclosing the feed area also maximises the efficiency of the farm, and indirectly local air quality, through reduced feed wastage and improved animal health and welfare.

Whilst it is recognised that the farm lies within an area not identified by Catchment Sensitive Farming as 'high priority' in the Esk catchment, the development will provide positive benefits to reducing risk of diffuse pollution from the land holding.

2.3 Conclusions

The results clearly demonstrate that improving the current housing system with the new development will be insignificant from an ammonia perspective. The proposed buildings would therefore have a positive effect upon local air quality, no impact in increasing ammonia emissions.

Using SCAL, we were able to estimate how moving emission sources to an internal environment affects emission dispersal from the site and demonstrate how local air quality will be positively affected by the proposed buildings.

The assessment shows that by improving the building design and roofing over the area between the proposed new building and the existing cattle shed will result in impacts which are insignificant.

The air quality report must be considered alongside the reduction in surface runoff (raised by Parish Council) attributable to the removal of dirty water associated to the open-air feed lot.

2.3.1 High Farm ammonia mitigating actions

The development at High Farm will contribute reductions in ammonia emissions through a range of mitigation measures. The below summary provides the key actions which are included in the proposed farm management system and will further reduce ammonia impacts on the local environment. SCAL does not have the capability to model these impacts but they are 'Best Available Techniques' and a supporting case study produced by Promar International for Defra is included for reference.

- The nutritional protein within the dairy herd is currently working towards 16.2%. This will result in a reduce ammonia emission per cow of approximately 11%.
- Regular cleaning (up to 4 times per day) of the proposed building will reduce the ammonia emissions by 20% by reducing the volume of slurry exposed to the air.
- Use of water in specific areas of the building to flush passageways directly after scraping to remove slurry. This provides a 7% reduction in ammonia emissions per cow.

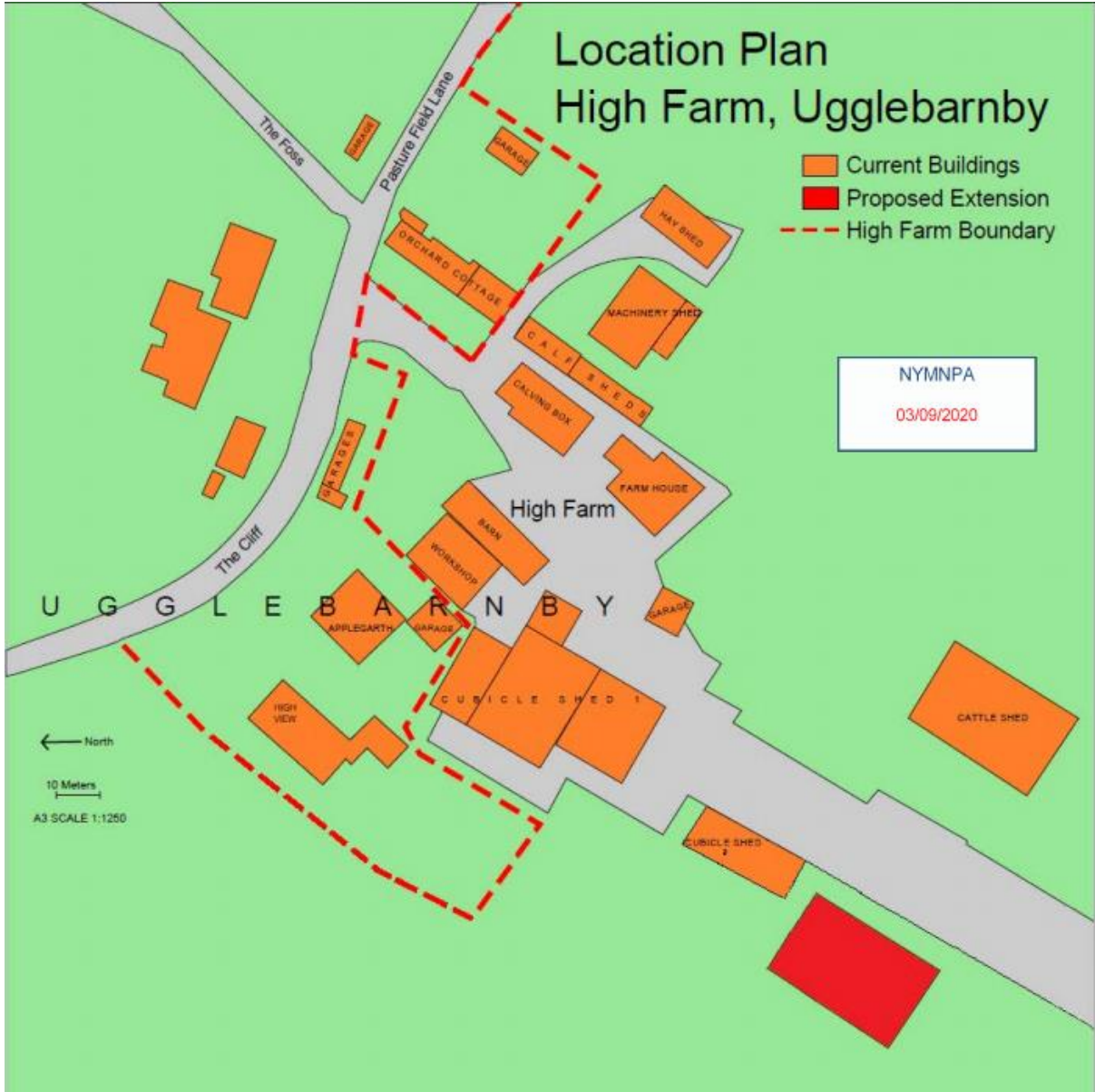
- Effective drainage will be a key mitigation in the floor design of the building. The grooved floor will quickly remove liquid/urine and reduce mixing of excreta and urine which creates ammonia emissions.
- Bedding using chopped straw will result in lower emissions as it is more absorbent of urine. The increased frequency of using straw is proven to lower ammonia emissions.
- Supporting evidence to demonstrate the positive effect of mitigation actions to reduce ammonia emissions from building design were incorporated into this best practice case study. These are relevant to the High Farm planning application: <http://publications.naturalengland.org.uk/publication/5791522916401152?category=5100549248909312>. This document was written and produced by Promar International for Natural England, Catchment Sensitive Farming and Defra.

Furthermore, the current slurry management and application regime means further abatement will be delivered. The farm is maximising best practice application methods which have a low impact on ammonia emissions. The farm utilises expert support to reduce ammonia impact and works with a highly skilled contractor who only applies slurry through low ammonia emission technology. This reduces ammonia from slurry storage and spreading by approximately 55 per cent.

Section 3. Appendices

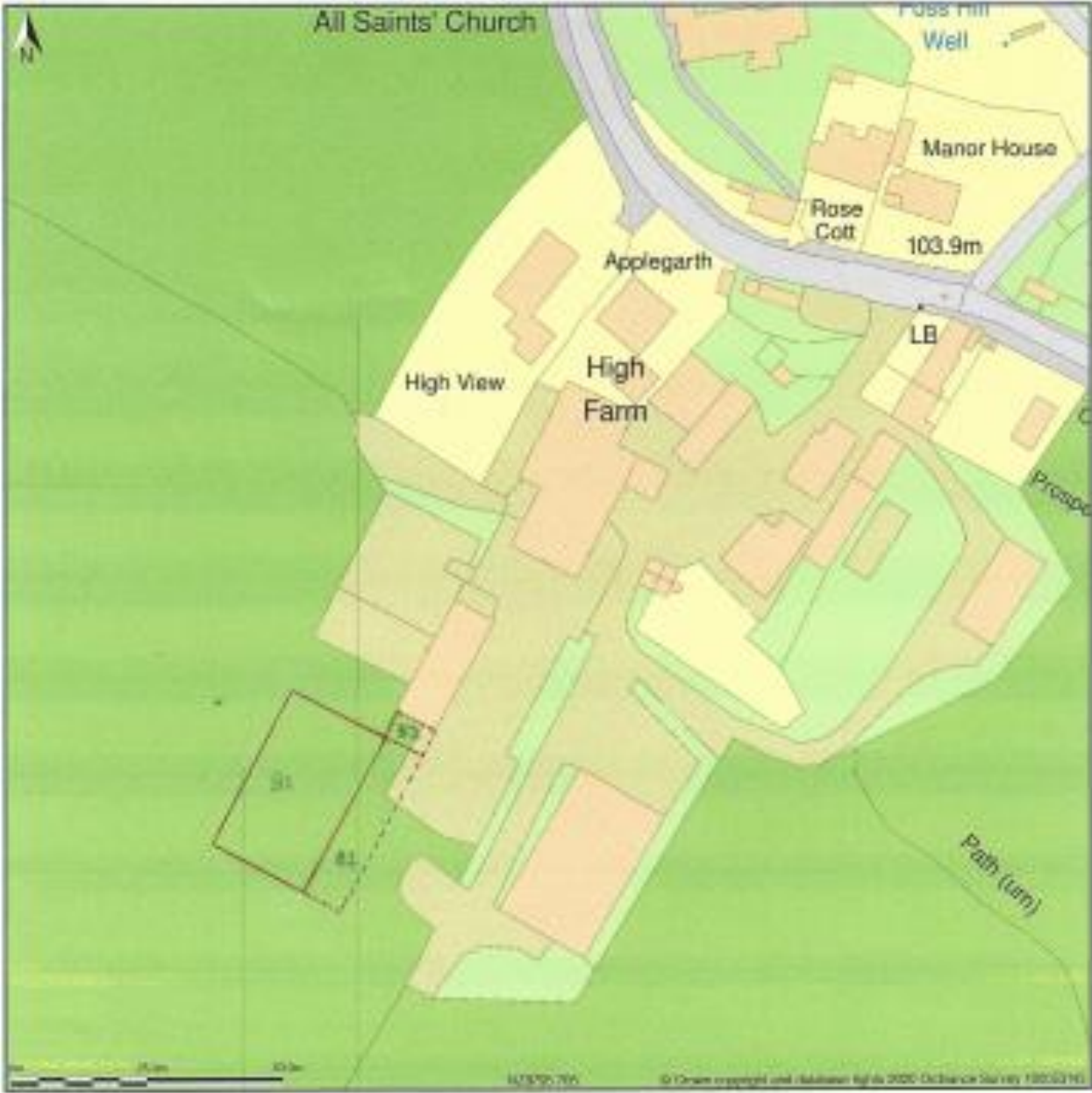
3.1 Appendix 1: Site layout

3.1A; Location plan and development proposal



Location plan for High Farm. The red block on the west of the site indicates the location of 'building 1', the main building proposed in the development.

3.1B: Proposed livestock housing and extension



Location plan for High Farm, outlining the proposed housing and extension to the existing cubicle shed. 'B1' indicates building 1, the main building proposed in the development. 'B2' indicates the extension which will join the cubicle shed and 'B2' to form one undercover housing and feeding area as part of the proposed plans.