



MEMORANDUM

To	Mr Michael Monagle
From	Micheal Fogarty, micheal.fogarty@katestone.global
Client name	Mr Michael Monagle
Deliverable No.	DK23018-8
Subject	Annakisha Pig Farm Licence Review - RFI
Date	2 July 2024

Dear Michael,

Katestone was commissioned by Mr Michael Monagle to complete an ammonia impact assessment for a pig farm at Annakisha, Co. Cork. Katestone completed the report entitled 'Ammonia Impact Assessment – Integrated Pig Farm at Annakisha, Co. Cork' (report DK23018-7) referred to here as the Original Report in March 2024.

The Original report was submitted as part of a licence review application for the pig farm in 2024. EPA reviewed the Original Report and subsequently issued a request for further information (RFI) that stated:

1. *The submitted NIS does not address all of the European sites listed in the AA Screening Determination, issued by the Agency on 15 November 2023, which identified that these sites may be negatively impacted by emissions to air of ammonia (and associated nitrogen deposition) from the installation. Update the NIS accordingly.*
2. *Dietary crude protein*
 - a. *Identify the dietary crude protein concentrations to be fed by animal category (i.e. dry sows, farrowing sows, weaners, growers, finishers).*
 - b. *Where it is proposed that a weighted average within one of the above categories be used in the calculation of the dietary crude protein concentration, provide indicative numbers for the numbers of animals and crude protein concentrations used in the calculation of these weighted averages.*
 - c. *Indicate how compliance with the proposed crude protein concentrations (particularly the proposed weighted average concentrations) will be demonstrated to the Office of Environmental Enforcement.*

Attachment A of this memo provides the results of an ammonia impact assessment at all Natural 2000 sites listed in the AA Screening Determination in response to Item 1.

Attachment B of this document provides a response to Item 2.

If you have any questions, please do not hesitate to contact the undersigned.

Kind regards,

Micheal Fogarty

ATTACHMENT A – ADDENDUM – AMMONIA ASSESSMENT

A1 Overview

Attachment A is an addendum to Katestone report entitled 'Ammonia Impact Assessment – Integrated Pig Farm at Annakisha, Co. Cork' (report DK23018-7) referred to here as the Original Report. The results presented in this addendum are based on a dispersion modelling assessment that was conducted using the same approach and model configuration as described in the Original Report.

The Original report was submitted as part of a licence review application for the pig farm in 2024. EPA reviewed the Original Report and subsequently issued a request for further information (RFI) in relation to the assessment. Item 1 of the EPA RFI stated:

The submitted NIS does not address all of the European sites listed in the AA Screening Determination, issued by the Agency on 15 November 2023, which identified that these sites may be negatively impacted by emissions to air of ammonia (and associated nitrogen deposition) from the installation. Update the NIS accordingly.

Attachment A is an addendum the Original Report that details Katestone's response to Item 1 of the EPA RFI. The dispersion modelling assessment undertaken in response to the EPA RFI was conducted using the same approach and model configuration as described in the Original Report.

It describes the impacts of ammonia and nitrogen deposition at two Natura 2000 sites not included in the original assessment including:

- The Ballyhoura Mountains SAC
- The Carrigeenamronety Hill SAC.

A2 Sensitive Receptors

The sensitive receptors included in the dispersion modelling assessment are at locations on the Ballyhoura Mountains SAC (DR 87 to DR95) and the Carrigeenamronety Hill SAC (DR95 and DR96) that are nearest to the Site. The modelled locations are presented in Table 1.

Table 1 The discrete receptor locations included in the dispersion modelling assessment

Natura 2000 site	Receptor	Location (UTM)	
		km	km
Ballyhoura Mountains SAC	DR87	527.676	5794.488
	DR88	529.506	5794.555
	DR89	530.768	5795.012
	DR90	531.806	5794.756
	DR91	532.353	5794.488
	DR92	533.541	5793.954
	DR93	534.992	5793.625
	DR94	536.003	5793.017
Carrigeenamronety Hill SAC	DR95	537.923	5793.333
	DR96	538.838	5793.287

A3 Assessment Criteria

A review of the conservation objectives published by NPWS for the Ballyhoura Mountains SAC indicate that the habitats and species listed as conservation objectives with sensitivity to atmospheric ammonia and nitrogen deposition include:

- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- European dry heaths [4030]
- Blanket bogs (* if active bog) [7130]

A review of the conservation objectives published by NPWS for the Carrigeenamronety Hill SAC indicate that the habitats and species listed as conservation objectives with sensitivity to atmospheric ammonia and nitrogen deposition include:

- Killarney Fern (*Trichomanes speciosum*) [1421]
- Dry Heath [4030]

Conservatively, the following critical loads and levels were applied to all DR locations on:

- Ballyhoura Mountains SAC:
 - A critical level of 1µg/m³ which assumes that all these areas contain the ammonia sensitive habitats
 - A critical load of 5 kg/ha/year) which assumes that all these areas contain Blanket bogs.
- Carrigeenamronety Hill SAC:
 - A critical level of 1µg/m³ which assumes that all these areas contain the ammonia sensitive habitats
 - A critical load of 10 kg/ha/year) which assumes that all these areas contain Killarney Fern (*Trichomanes speciosum*) or Dry Heath.

A4 Background concentrations of ammonia and nitrogen deposition

The background ammonia concentration and nitrogen deposition flux rates at each modelled sensitive receptor were obtained from the Simple Calculation of Atmospheric Impacts Limits (SCAIL) online tool as recommended in EPA's Ammonia and Nitrogen Assessment Guidance (EPA, 2023). The background concentrations of ammonia and nitrogen deposition levels adopted in the assessment are presented in Table 2.

Background ammonia concentration and nitrogen deposition flux rates adopted in the assessment were included in the assessment methodology defined in EPA's Ammonia and Nitrogen Assessment Guidance.

Table 2 The background concentrations of ammonia and nitrogen deposition levels adopted in the assessment (based on SCAIL)

NAME	NH ₃ Background (ug m ⁻³)	Criteria	NDEP Background (kg/ha/yr)	Criteria
DR87	1.64	1	6.77	5
DR88	2.28	1	6.13	5
DR89	2.3	1	6.22	5
DR90	2.29	1	6.25	5
DR91	2.24	1	6.17	5
DR92	2.2	1	6.04	5
DR93	2.19	1	5.92	5
DR94	2.16	1	5.95	5
DR95	2.2	1	6.00	10

NAME	NH ₃ Background (ug m ⁻³)	Criteria	NDEP Background (kg/ha/yr)	Criteria
DR96	2.24	1	5.99	10

A5 Ammonia and Nitrogen Assessment Results

The results of the assessment of impacts at the Ballyhoura Mountain SAC and the Carrigeenamronety Hill SAC are presented in this section. The Ballyhoura Mountains SAC is represented by receptor locations from DR87 to DR94. The Carrigeenamronety Hill SAC is represented by receptor locations DR95 to DR96

Katestone followed the step-wise approach described in EPA's Ammonia and Nitrogen Assessment Guidance in this assessment. The results of each step considered in the modelling assessment are presented in this section.

In summary, following the step-wise approach described in EPA's Ammonia and Nitrogen Assessment Guidance required the following steps to be completed:

- Step 1
- Step 4
- Step 5.

A5.1 Results of Step 1

Question 2 of Step 1 in the EPA's Ammonia and Nitrogen Assessment Guidance asks:

Are the background levels already exceeded for the ammonia critical level or nitrogen critical load at Natura sites within the zone of influence of my site (as reported by SCAIL)?

The background concentrations of ammonia and the background nitrogen deposition flux as determined using the SCAIL screening tool are presented along with the appropriate critical level for ammonia and critical load for nitrogen deposition fluxes in Table 2.

The results show that the background concentrations of ammonia and the background nitrogen deposition flux exceed the relevant critical level for ammonia and critical load for nitrogen deposition fluxes at a number of the modelled discrete receptor locations on each of the Natura 2000 sites including:

- Ballyhoura Mountain SAC (Receptors – DR87 – DR94)
- Carrigeenamronety Hill SAC (Receptors – DR95 – DR96).

According to Step 1 of EPA's Ammonia and Nitrogen Assessment Guidance:

- The approaches using the SCAIL-Agriculture model described in Step 2 and Step 3 of the EPA's Ammonia and Nitrogen Assessment Guidance are not applicable.
- A detailed assessment completed in accordance with Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance is, therefore, required to be completed. The results of the Step 4 assessment are presented in Section A5.2.

A5.2 Results of Step 4

Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance requires a licensee/applicant to complete a detailed dispersion modelling assessment.

Dispersion modelling has been conducted for five years of meteorological data. The following sections present the highest concentrations across the five-year modelled period as required by EPA dispersion modelling guidance.

The predicted ground-level concentrations of ammonia and annual average flux rate of nitrogen deposition at the nearest ecologically sensitive locations due to the pig farm are presented in Table 3.

The results in Table 3 are compared against the Step 4 criteria identified in EPA's Ammonia and Nitrogen Assessment Guidance, which require the process contribution of the pig farm (PC) to be:

- $\leq 1\%$ of the critical level for ammonia
- $\leq 1\%$ of the critical load for nitrogen deposition?

The results presented in Table 3 show that, in relation to the 1% threshold identified in Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance, the PC due to the pig farm exceeds the 1% PC threshold defined in Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance for ammonia and nitrogen deposition at two modelled discrete receptor locations on Ballyhoura Mountain SAC (Receptors – DR86 – DR94).

The results presented in Table 3 show that, in relation to the 1% threshold identified in Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance, the PC due to the pig farm does not exceed the 1% PC threshold defined in Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance for ammonia and nitrogen deposition at any modelled discrete receptor locations on the Carrigeenamronety Hill SAC (Receptors – DR96 – DR97)

If the criteria identified in Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance are exceeded, the licensee/applicant is required to undertake the assessment defined in Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance. Step 5 requires detailed modelling that takes account of in-combination effects. The results of the assessment undertaken to consider the impacts of the proposed development in the context of Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance is presented in Section A5.3 for the modelled sensitive locations on the Ballyhoura Mountain SAC (Receptors – DR86 – DR94).

Table 3 The predicted ground-level concentrations of ammonia and annual average flux rate of nitrogen deposition at the nearest ecologically sensitive locations on the modelled Natura 2000 sites due to the pig farm

DR	Ammonia			Nitrogen Deposition		
	Concentration	Criteria	% of criteria	Rate	Criteria	% of criteria
	µg/m ³	µg/m ³		kg/ha/yr	µg/m ³	
DR87	0.004	1	0.4%	0.03	5	0.7%
DR88	0.004	1	0.4%	0.03	5	0.7%
DR89	0.003	1	0.3%	0.03	5	0.6%
DR90	0.004	1	0.4%	0.04	5	0.7%
DR91	0.004	1	0.4%	0.04	5	0.8%
DR92	0.005	1	0.5%	0.05	5	0.9%
DR93	0.005	1	0.5%	0.05	5	1.0%
DR94	0.006	1	0.6%	0.06	5	1.1%
DR95	0.006	1	0.6%	0.06	10	0.6%
DR96	0.004	1	0.4%	0.04	10	0.4%

A5.3 Results of Step 5

Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance requires detailed modelling to determine the in-combination effects of:

- The pig farm
- Intensive agricultural installations (AIA) built or approved since the most recent update of background levels (determined using SCAIL-Agriculture).

The results of the in-combination assessment are assessed against the criteria identified in Step 5.

The most recent update to background levels of ammonia and nitrogen deposition was in 2018 with data used based on the locations of pig and poultry farms up to 2015 (Kelleghan *et al.*, 2022).

A review of nearby IAIs (IAI Review) was undertaken to identify all IAI developments that received licence/planning approval since 2015 or IAI developments that were built since 2015 within the following set-back distances identified in Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance:

- Licensed IAI within 10 km of the closest point of the Ballyhoura Mountains SAC to the pig farm.
- Sub-threshold Licensed IAI within 5 km of the closest point of Ballyhoura Mountains SAC to the pig farm.

The IAI Review included detailed searches of satellite imagery, the EPA licence database and the planning systems of:

- Limerick County Council
- Cork County Council.

The areas searched were determined using the methodology defined in EPA's Ammonia and Nitrogen Assessment Guidance and are presented in Figure 1.

The IAI Review identified:

- There are a small number of IAI in the areas searched
- There have been no new EPA licence approvals for IAI within the search areas since 2015
- EPA has not approved any increases in stocking numbers at any EPA licensed IAI in the search areas after 2015
- EPA has not approved any licence amendments/reviews for any EPA licensed IAI in the search areas after 2015
- No planning approvals for sub-threshold IAI within a 5 km setback distance from the Ballyhoura Mountains SAC have been issued after 2015.

The results of the IAI Review identified there is no requirement for a cumulative assessment of impacts on the Ballyhoura Mountains SAC as no IAI meet the requirements of Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance. Accordingly, the cumulative impact on the Ballyhoura Mountains SAC of all IAI as defined in Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance is equal to the impact of the pig farm in isolation.

The results have been assessed against the Step 5 criteria identified in EPA's Ammonia and Nitrogen Assessment Guidance that require the cumulative impact to be less than:

- 20% of the critical level for ammonia
- 20% of the critical load for nitrogen deposition.

The results of the Step 5 cumulative assessment on ecologically sensitive receptors on the Ballyhoura Mountains SAC are presented in Table 4.

At the Ballyhoura Mountains SAC the worst-case cumulative impact due to the pig farm in combination with other IAls that meet the requirements of Step 5 was well below the in-combination assessment level of 20% with the highest modelled results at any of the modelled sensitive locations being:

- 0.6% of the critical level for ammonia
- 1.1% of the critical load for nitrogen deposition.

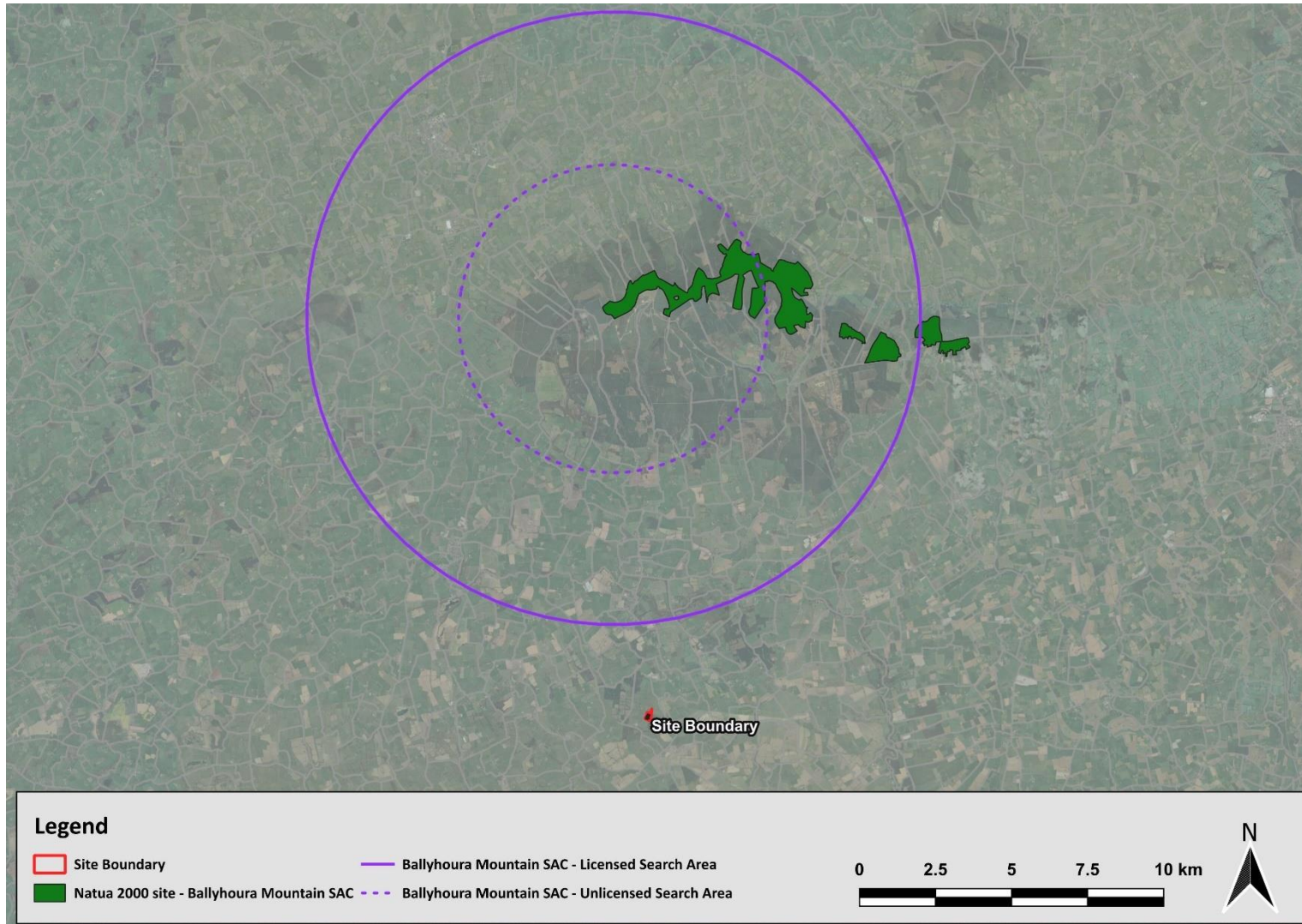


Figure 1 Areas searched for background IAs and background IAs that were included in the cumulative assessment using the methodology defined in EPA's Ammonia and Nitrogen Assessment Guidance

Table 4 The predicted cumulative ground-level concentrations of ammonia and annual average flux rate of nitrogen deposition at the ecologically sensitive locations on the Galtee Mountain SAC due to the pig farm in combination with background facilities that meet the requirements of Step 5

DR	Ammonia			Nitrogen Deposition		
	Concentration	Criteria	% of criteria	Rate	Criteria	% of criteria
	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$		$\text{kg}/\text{ha}/\text{yr}$	$\mu\text{g}/\text{m}^3$	
DR87	0.004	1	0.4%	0.03	5	0.7%
DR88	0.004	1	0.4%	0.03	5	0.7%
DR89	0.003	1	0.3%	0.03	5	0.6%
DR90	0.004	1	0.4%	0.04	5	0.7%
DR91	0.004	1	0.4%	0.04	5	0.8%
DR92	0.005	1	0.5%	0.05	5	0.9%
DR93	0.005	1	0.5%	0.05	5	1.0%
DR94	0.006	1	0.6%	0.06	5	1.1%
DR95	0.006	1	0.6%	0.06	10	0.6%
DR96	0.004	1	0.4%	0.04	10	0.4%

A6 Conclusions

Mr Michael Monagle commissioned Katestone to complete an ammonia impact assessment (AIA) for a pig farm located at Annakisha North, Doneraile Co. Cork (Site). Katestone completed the AIA report (Original Report) for the pig farm which was submitted as part of a licence review application.

EPA reviewed the Original Report and subsequently issued a request for further information (RFI) in relation to the assessment. Item 1 of the EPA RFI requested an assessment of impacts of ammonia and nitrogen deposition resulting from operations at the pig farm on two Natura 2000 sites that were not considered in the Original Assessment.

Attachment A is an addendum to the Original Report that details Katestone's response to Item 1 of the EPA RFI. The dispersion modelling assessment undertaken in response to the EPA RFI was conducted using the same approach and model configuration as described in the Original Report.

The results of the AIA are presented here:

- The results of the Step 1 assessment indicated that:
 - The approaches using the SCAIL-Agriculture model described in Step 2 and Step 3 of the EPA's Ammonia and Nitrogen Assessment Guidance are not applicable
 - A detailed assessment completed in accordance with Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance is, therefore, required to be completed.
- The results of the Step 4 assessment show that, in relation to the 1% threshold identified in Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance, the PC due to the pig farm:
 - Meets the requirement of Step 4 for ammonia at all modelled receptor locations on the:
 - Ballyhoura Mountains SAC (Receptors – DR87 – DR94)
 - Carrigeenamronety Hill SAC (Receptors – DR95 – DR96)
 - Exceeds the requirement of Step 4 for nitrogen deposition at a single modelled discrete receptor location on the Ballyhoura Mountains SAC (Receptors – DR87 – DR94)
 - Meets the requirement of Step 4 for nitrogen deposition at all modelled receptor locations on the Carrigeenamronety Hill SAC (Receptors – DR95 – DR96)
- The results of the Step 4 assessment indicate that a Step 5 assessment, involving detailed modelling that takes account of in-combination effects, is required for nitrogen deposition at the modelled sensitive locations on the Ballyhoura Mountains SAC.
- The Step 5 assessment requires a review of background IAIs that needed to be included in the in-combination assessment for nitrogen deposition on the Ballyhoura Mountains SAC. This review determined there is no requirement for a cumulative assessment of impacts on the Ballyhoura Mountains SAC as no IAI meets the requirements of Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance to be included. Accordingly, the cumulative impact on the Ballyhoura Mountains SAC of all IAI as defined in Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance is equal to the impact of the pig farm in isolation.
- The results of the in-combination Step 5 assessment show that At the Ballyhoura Mountains SAC the worst-case cumulative impact of nitrogen deposition due to the pig farm in combination with other IAIs that meet the requirements of Step 5 was well below the in-combination assessment level of 20% with the highest modelled results at any of the modelled sensitive locations being 1.1% of the critical load for nitrogen deposition.

Final Report Findings

The results of the assessment indicate that the impacts in isolation and cumulative impacts of the proposed pig farm with background IAIs are under EPA limits and therefore **comply** with

- The Step 4 evaluation criteria at all modelled locations on the Carrigeenamronety Hill SAC (Receptors – DR95 – DR96)
- The Step 4 evaluation criteria for ammonia at all modelled locations on Ballyhoura Mountains SAC (Receptors – DR87 – DR95)
- The Step 5 evaluation criteria for nitrogen deposition at all modelled locations on Ballyhoura Mountains SAC (Receptors – DR87 – DR95)

ATTACHMENT B – RESPONSE TO ITEM 2 – DIETS

B1 ITEM 2A

B1.1 EPA RFI

Identify the dietary crude protein concentrations to be fed by animal category (i.e. dry sows, farrowing sows, weaners, growers, finishers).

B1.2 Katestone response

The site will adopt low protein diets as a BAT technique to reduce ammonia emissions to the atmosphere. The level of protein in diets at the pig farm will be limited (as a weighted average) to:

- 14.5% for sows (gilts, dry sows and farrowing (lactating) sows)
- 17.5% for weaners
- 15% for fatteners (growers and finishers).

B2 ITEM 2B

B2.1 EPA RFI

Where it is proposed that a weighted average within one of the above categories be used in the calculation of the dietary crude protein concentration, provide indicative numbers for the numbers of animals and crude protein concentrations used in the calculation of these weighted averages.

B2.2 Katestone response

The diets at the site are supplied in the following categories:

- Sows:
 - Gilt diet
 - Farrowing (lactating) sow diet
 - Dry Sow diet
- Weaners
 - Gromaker 1 diet
 - Gromaker 2 diet
 - Gromaker 3 diet
- Finisher diet

The weighted average for each of sows, weaners and finishers will be calculated based on the % of each diet supplied to the site and not the number of pigs to which the diet is fed.

Recent crude protein analysis undertaken on each of these diets and the indicative percentage that each diet makes up of total farm feed are presented in Figure 2. The information in Figure 2 provides an indication of:

- Crude protein in each of the diets
- The percentage each diet makes up of total farm feed

The weighted average crude protein levels at the pig farm based on the data is also presented for:

- Weaners
- Sows
- Fatteners

Annakisha Pig Farm Feed Protein Levels

Diet Name	Analysed Protein Level	% Use of Total Feed
Gromaker 1	16.96	1.10
Gromaker 2	17.01	4.29
Gromaker 3	17.72	12.55
Gromaker 4	0.00	0.00
Finisher 1	14.94	65.50
Finisher 2	0.00	0.00
Gilt	11.70	1.50
Lactating Sow	16.57	7.81
Dry Sow	12.50	7.26

Protein Level By Pig Growth Stage

	%
Weaner Avg Protein	17.50
Finisher Avg Protein	14.94
Sow Avg Protein	14.35

Figure 2 Annakisha Pig Farm Feed Protein Levels (Supplied to Katestone by Makeway Ltd)

B2.3 Important additional information relevant to response to Item 2b

There are complexities associated with the regulation of CP levels based on a single feed analysis of dietary CP levels being below the specific level that a diet was formulated to achieve, as has been undertaken as part of this response. Enforcement around crude protein level in diets by EPA needs to account for the following:

- Pig diets are made up of natural food components (e.g. wheat, barley, soya bean meal) that are subject to natural variations in nutritional components (such as fat, protein, carbohydrate, vitamin, mineral content) and synthetic components (e.g. synthetic amino acids such as lysine, synthetic vitamins, synthetic minerals).

- The standard practice of animal feed suppliers when generating a diet with a specific crude protein (CP) content is to formulate the diet based on the weighted average CP content of each food component that goes into the diet
- The CP content of each food component is the average CP content as determined from hundreds of historical individual tests of each food component (i.e. Nutritional companies hold databases containing the results of CP analysis on hundreds of samples of wheat; The average CP level of wheat samples in the database is used in the formulation of a diet produced by that nutritional company that contains wheat).
- As a result the CP level of a formulated diet is subject to normal variations due to natural CP variations in nutritional components.
- Over time it would be expected that analytical testing of a formulated diet would show a distributed range of CP levels with the average CP level of that distribution being at the level targeted when the diet was formulated.
- Importantly, historical research linking CP levels to odour and ammonia emission rates was based on diets formulated to specific CP levels and not diets that were analytically tested to ensure that they were at a specific CP level. These diets were therefore subject to the same natural variations in CP levels around the CP levels to which the diet was formulated.

The approach to the enforcement of CP levels in diets:

- Should therefore not be based on a single feed analysis of dietary CP levels being below the specific level that a diet was formulated to achieve
- Needs to account for the natural variation of CP of the feed components that make up a diet
- Should be based on the results of analytical CP testing of a diet being within the typical range of CP levels that would be expected within a diet formulated with a specific level of CP with typical range of CP levels being informed by a database of historical analytical tests of CP in feed components
- The determination of the typical range of CP levels in a diet formulated to a specific level requires a level of work to be undertaken as there may be some variances in the databases held by researchers and nutritional companies.

B3 ITEM 2C

B3.1 EPA RFI

Indicate how compliance with the proposed crude protein concentrations (particularly the proposed weighted average concentrations) will be demonstrated to the Office of Environmental Enforcement.

B3.2 Katestone response

At this time Katestone has no proposed methodology to demonstrate compliance with proposed crude protein concentrations to the Office of Environmental Enforcement. Katestone has investigated potential methodologies for demonstrating compliance and has part of this investigation has determined that there are significant uncertainties in dietary science associated with natural variations in nutrient components of natural ingredients and accuracy of measurement technologies. These issues need to be resolved before a robust method to demonstrate compliance with proposed crude protein concentrations to the Office of Environmental Enforcement can be determined.

Katestone findings are based on investigations including review of peer reviewed literature, discussions with animal nutritionists including experts in pig nutrition at University College Dublin and numerous nutritionists employed by commercial pig feed producers in Ireland.

Katestone has relayed its findings to EPA licence officers verbally. It was agreed as part of these discussions that the issues highlighted above needed to be addressed before a robust method to demonstrate compliance with proposed crude protein concentrations to the Office of Environmental Enforcement can be determined.