Ammonia Strategy Consultation Report

April 2024

Introduction

In January 2023 DAERA published a consultation on the draft Ammonia Strategy for Northern Ireland seeking views from all interested parties. Ammonia emissions have adverse effects on nature and public health and the draft Ammonia Strategy aims to address emissions and their impact on the environment in Northern Ireland. Agriculture makes a significant contribution to the Northern Ireland economy however it also produces 97% of current ammonia emissions. Therefore, action on ammonia is required urgently to support our local farm businesses and rural communities and help them to thrive and be sustainable, while at the same time protecting our environment.

Reducing ammonia emissions will require changes to some farming practices including increased uptake of established and new technologies. Optimum use of increasingly valuable nutrients and enhanced production efficiencies will also make important contributions. Change can be a challenge but change is necessary to deliver the short and long term benefits of reduced ammonia emissions.

The draft strategy was developed under the leadership of the former DAERA Minister to plan the way forward to reduce ammonia emissions from agriculture. Responses to the consultation are being used to inform a reworked draft Ammonia Strategy for an incoming Minister and new Executive to consider.

The draft Strategy sets out a strategic approach to ammonia. It builds on the policy messages arising from the scientific evidence base and recognises DAERA's legal obligations to reduce emissions and protect habitats. The strategic approach includes a series of targets which aim to set ambition and guide action.

The long-term target is to reduce ammonia emissions to a point where Critical Loads of nitrogen deposition and Critical Levels of ammonia are not being exceeded at designated sites.

Given the generational challenge posed by the scale of current exceedances, interim targets are required. The targets DAERA proposes for 2030 are to:

• Reduce agricultural ammonia emissions from Northern Ireland by at least 30%, based on the 2020 emissions levels (from 31.2 kt in 2020 to 21.8 kt in 2030).

• Reduce ammonia concentrations at all designated sites by at least 40% (using 2020 as the baseline year) or to below Critical Levels.

DAERA proposes two pillars in a coherent approach to ammonia which can deliver on the targets including the following elements:

1. An ambitious and verifiable ammonia reduction programme:

    • Implemented on a Northern Ireland-wide basis; and

- Spatially targeted in areas around designated sites.

2. A strategic programme of conservation, restoration, and management of our most valuable habitats.

A list of the questions posed is attached in Annex A. The purpose of this document is to provide a synopsis of the responses and views submitted by stakeholders.

In July 2023, DAERA separately published a Call for Evidence to inform a new Operational Protocol to assess the impacts of air pollution on the natural environment. The Call for Evidence closed in October 2023 and, DAERA is reviewing all the available evidence relating to the assessment of air quality impacts on designated sites and protected habitats. The next steps will be the development of a new Operational Protocol to inform DAERA's planning advice and decision-making processes in the assessment of plans and projects, for an incoming Minister and new Executive to consider.

Executive Summary

In January 2023 DAERA published a consultation on the draft Ammonia Strategy for Northern Ireland which closed in March 2023. In total, 540 responses were received.

Across the majority of respondents, there was broad agreement on the need to take action on ammonia emissions in Northern Ireland to protect the environment, while at the same time supporting our local farm businesses and rural communities, helping them to thrive and be sustainable.

Responses indicated a strong level of interest in the draft Ammonia Strategy proposals for Northern Ireland.

A brief synopsis of the responses to the questions is as follows:

1. Reduction targets

Responses reflected the full spectrum in terms of the degree of support indicated for the proposed targets. The greatest number of responses were in two categories: those seeking more information and detail on the proposed targets and those citing significant financial concerns.

2. Proposed pillars of the Ammonia Strategy

Responses reflected the full spectrum in terms of the degree of support indicated for the proposed pillars. The greatest number of responses sought more detail on the proposed measures, farm level impacts and the Regulatory Impact Assessment.

3. How DAERA will enable this strategy

Responses ranged from calls for more urgency in implementation and delivery of the strategy to not being supportive of the strategy. The greatest number of responses were in two categories: those who sought more information or clarification on the proposals, and coherence with other strategies and those who cited the need for a full Rural Needs Impact Assessment (RNIA), Equality Impact Assessment (EQIA), and consideration of Less Favoured Areas (LFAs).

4. Proposals for low emission livestock housing

Responses ranged from the measures needing to reflect the need for urgency, to not being supportive of the proposals. The greatest number of responses stated the need for the proposals to be economically viable and supported, for example through financial assistance, research, training, and education.

5. Proposals for emerging technologies

Responses reflected the full spectrum in terms of support for the proposals. The greatest number of responses held the view that the technologies must be proven and cost effective, with a number of suggestions being made.

6. Proposed additional progression point in the move towards LESSE adoption requiring slurry which is being exported between farms to be spread by LESSE from 1st January 2025

Responses ranged from a need for greater urgency in the move to Low Emission Slurry Spreading Equipment (LESSE) adoption, to being opposed to the proposal. The greatest number of respondents were in two categories: those who had concerns about the impact on small farms and those who were supportive of the proposals.

7. Proposal to require all slurry to be spread by LESSE by 2026

Responses ranged from a need for greater urgency in the proposal, to being opposed to or not supportive of the proposal. The greatest number of respondents were in two categories: those who had concerns about both the impact on small farmers and silage contamination and those who had concerns about both the safe use of equipment and slurry residues in silage.

8. Proposals to encourage implementation of longer grazing seasons

Responses ranged from a need for greater urgency in the proposals, to not being supportive of the proposals. The greatest number of respondents stated that the length of grazing season is determined by weather and ground conditions.

9. How to reduce ammonia emissions from chemical fertiliser, including the potential introduction of a prohibition on the use of unprotected urea fertiliser

Responses ranged from a need for urgency in the proposal, to not being supportive of the proposal. The greatest number of respondents were in two categories: those who were supportive of a prohibition of unprotected urea and those were supportive of the use of an inhibitor but were not supportive of a ban on unprotected urea.

10. Proposals to reduce crude protein levels in livestock diets

Responses ranged from a need for urgency in the proposals, to not being supportive of the proposals. The greatest number of respondents were in three categories: those who supported the proposals if performance was not affected; those who fed diets according to processor recommendations and those who cited the need for financial support.

11. Proposals relating to improving feed efficiency through genetic improvement

Responses ranged from a need for urgency in the proposal, to not being supportive of the proposals. The greatest number of respondents were in two categories: those who had qualified support for the proposals and those who do not select their livestock genetics.

12. Proposals to encourage tree plantations around livestock housing

Responses ranged from a need for greater urgency in the proposals, to not being supportive of the proposals. The greatest number of respondents were in two categories: those who were supportive of the proposals and those who had qualified support of the proposals.

13. How to encourage the safe covering of existing above ground slurry stores and lagoons

Responses ranged from calls for the measure to go further, to not being supportive of the measure. The greatest number of respondents were in two categories: those who raised further considerations and those who were supportive of the measures.

14. DAERA's plans to support ammonia reduction measures through Green Growth and future agricultural policy

Responses ranged from agreeing that policies needed to be joined up, to not being supportive of the plans. The greatest number of respondents were in two categories: those who were not supportive of the plans and those who sought more detail and information or made suggestions.

15. DAERA's plans for knowledge transfer and education on ammonia reduction

Responses ranged from being supportive of the plans to not being supportive. The greatest number of respondents had qualified support for the plans.

16. Proposals for spatially targeted measures around designated sites

Responses ranged from calls for the measures to go further, to concerns about the impact of the measures. The greatest number of respondents were in two categories: those who had concerns about impact assessment and LFAs and those who sought more information and made recommendations.

17. Proposed conservation actions to restore habitats and support sustainable development

Responses ranged from a need for greater urgency in the proposals, to not being supportive of the proposals. The greatest number of respondents sought further information on the proposals or made recommendations.

18. Appropriate delivery and funding mechanisms to deliver habitat restoration

Responses ranged from stating that the proposals should go further, to not being supportive of the proposals. The greatest number of respondents sought information on funding or made suggestions.

19. What evidence or issues should be considered when assessing these impacts

Responses ranged from stating the need for clear assessment processes to not being supportive. The greatest number of responses were in two categories: those who had concerns about impact assessments and those who stated the need for a clear assessment process.

20. How DAERA should work with stakeholders to inform the direction and delivery of the strategy, and the detail of the various measures

Responses ranged from being supportive of stakeholder engagement, to making other suggestions. The greatest number of respondents were in two categories: those who were supportive of stakeholder engagement and those who stated concerns about the EQIA.

21. Any other comments or contributions on the document

Responses ranged from stating that the strategy should go further, to not being supportive of the strategy. The greatest number of respondents were in two categories: those who stated that the strategy should go further and those who sought further information or made suggestions about the strategy.

Responses to the Consultation

DAERA launched the consultation on the draft Ammonia Strategy on 4 January 2023 and it ran until 3 March 2023. During its eight-week term, the consultation was publicised through DAERA media platforms including DAERA Twitter and Facebook accounts, DAERA Business Development Groups, and the farming press. In person stakeholder information sessions also took place at each of the College of Agriculture, Food and Rural Affairs' (CAFRE)three campuses in Antrim, Cookstown and Enniskillen.

The consultation questionnaire provided respondents with the opportunity to answer questions based on the proposals (see list of questions at Annex A) through Citizen Space, by email, or in hard copy. All questions were open questions with the opportunity for individual responses to be provided.

In total there were 540 responses; 36 were from organisations/representative groups listed at Annex B; 189 were submitted as individual responses; and 315 were submitted in 2 separate campaign responses.

The campaign responses were defined as large numbers of duplicates of an identical response. Campaign response A was submitted as a hard copy with 144 copies of identical responses, each signed by separate individuals. Campaign response A answered individual questions. A number of responses similar or identical to the campaign A response, were also submitted via Citizen Space and this is indicated in the presentation of responses for each question. Campaign response B comprised 171 identical responses submitted via email and did not answer any individual questions so is presented as a response to question 21. A list of stakeholders for each of the campaign responses is provided in Annex B.

Responses received were a combination of structured (answering specific (all or some) questions posed) or were unstructured, i.e. not specifying which question(s) the response related to. Where there was no indication of any individual question being answered a synopsis of the response was added at Q21 which asked: *Do you have any other comments or contributions on this document?*

Where respondents combined answers to specified groups of questions, the team allocated a synopsis of the response to the most relevant question(s). Analysis included both quantitative and qualitative assessment of responses detailing the number of respondents and providing a summary of responses in relation to the key themes identified. It was not compulsory for respondents to answer all questions. As such not all respondents answered each question and not all respondents provided comments to each question. The number of responses to each question is summarised in Annex A.

Once responses were allocated to the 21 questions, analysis commenced on a question-by-question basis. Answers to questions were examined and categorised according to the specific types of response provided to each individual question. Respondent organisations/representative

groups were also categorised based on their focus in relation to farming, environment or 'other' aspects. The latter category included for example: Councils; political parties/representatives; rural focused organisations and water focused organisations. The following sections of this document present a comprehensive summary of the responses made by stakeholders to the 21 questions included in the consultation.

For each question a summary of the total number of responses including the total number of representative organisations who responded is provided first, followed by a further breakdown of the number and types of responses within each category.

As with any Northern Ireland Civil Service public consultation, responses were received from a self-selecting range of respondents.

It should be noted that the views expressed in this report are those of respondents to the consultation exercise and are not necessarily shared by DAERA. The Ammonia and Nutrients Branch read and considered all comments before drafting this report.

2.4. The consultation document can be viewed on the DAERA website by clicking on the following link: https://www.daera-ni.gov.uk/consultations/draft-ammonia-strategy-northern-ireland-consultation

4. Summary of responses

Question 1 - What are your views on the Northern Ireland wide 2030 targets outlined in the 3.1 Targets section?

- In total there were 343 responses to this question. Of the total, 31 responses were from organisations, 168 were from individuals, and 144 were from campaign response A.

- Answers were assigned to seven separate categories following consideration. The number of responses in each category is set out in Table 1 followed by summaries of the responses.

Table 1. Number of responses to question 1 by category

Category	Number of organisations	Number of individuals	Campaign response A
Targets should be more ambitious	10	2	
Supportive of the targets	3	5	
Qualified support of the targets	2	1	
More information and detail required	10	76	
Significant financial concerns cited		50	144
Not supportive	6	23	
No comments		11	

Targets should be more ambitious

- SUMMARY - 10 organisations (7 environment focused, 1 rural focused, 1 Council, 1 political party/representative) and 2 individuals stated that the Northern Ireland wide 2030 targets outlined in the 3.1 Targets section should be more ambitious. Further detail from responses is summarised below.

- An environment focused organisation suggested that close to sensitive habitats, bespoke local targets are vital based on critical loadings and consideration should be given to setting differentiated targets or recognising the need for a proportionate response so sectors presenting the greatest challenge make the greatest reductions. A good example of a targeted approach is Fenn's & Whixall NNR Shared Nitrogen Action Plan.

- An environment focused organisation prefers more bespoke targets based on critical loadings; some key designated sites have such a high loading currently that even a 40% reduction might still result in depositions which will continue to cause vegetation damage and loss of habitat quality.

- An environment focused organisation stated that these targets seem inadequate to address the issue with the speed required and are based on modest changes in practices as opposed to the action that is needed to address the problem. Action must be taken now and rapidly to tackle the 'easiest' areas and recognise that every year that the issue is not addressed adds to the problem of damaged habitats, human health issues and costs.

- An environment focused organisation stated concerns that the set target reductions (by 2050) will be insufficient to change ecological conditions of designated areas on a scale required by the 30 x 30 commitment, and that the NI decline in biodiversity will continue.

- An environment focused organisation stated that the Ammonia Strategy fails to lay out a roadmap for the wider direction of travel for agriculture in Northern Ireland. Proposals should be more ambitious and underpinned by targets set out in the Environment Strategy. Ambition will only be achieved through effective policy coherence between this strategy, the upcoming Biodiversity Strategy, Clean Air Strategy, and the Future Agricultural Policy. It is unclear how this strategy will deliver on NI's International commitments such as the Gothenburg protocol, Espoo Convention, Water Framework Directive and UN Global Biodiversity Framework.

- An environment focused organisation strongly recommends that the target to reduce agricultural emissions of ammonia by at least 40% for designated areas is extended to include all ancient and long-established woodland sites in Northern Ireland.

- A rural focused organisation expressed concern that the measures are voluntary and surprise that no reference was made to reducing livestock numbers to reduce ammonia.

- A Council is concerned by the timescale (2050) to reduce ammonia emissions to a point where Critical Loads of nitrogen deposition and Critical Levels of ammonia are not being exceeded at designated sites and wishes to register its concern at elevated ammonia levels across Northern Ireland generally. They encourage DAERA to urgently set ambitious, robust, and verifiable targets.

- An individual expressed concern that 2 years has already been lost in the process, given the current climate emergency.

- An individual suggested a wider range of measures as foliar fertiliser and the role of biology in improving soil health and farm efficiencies.

Supportive of the targets

- SUMMARY - 3 organisations (2 Councils, 1 AD focused) and 5 individuals were supportive of the targets. Further detail from responses is summarised below.

- A Council welcomed the 2030 targets outlined and sought publication of the new Operational Protocol to further help achieve targets.

- A Council stated that ambitious and achievable targets are required to drive the ammonia reductions required and to protect nature.

- An Anaerobic Digestion (AD) focused organisation support targets to mitigate ammonia emissions produced by the AD industry and the wider agricultural sector.

- Two individuals stated that the targets are achievable.

Qualified support of the targets

- SUMMARY - 2 farming focused organisations and 1 individual were supportive of the targets while noting concerns. Further detail from responses is summarised below.

- A farming focused organisation stated that the Department must not use one rule for all, as there is a massive variation in emissions across Northern Ireland's farms and it will be in everyone's interest to achieve the targets as long as rules are fairly applied and funded.

- A farming focused organisation was supportive of the overall objectives of the Strategy but had some concerns around financing and delivery of the necessary infrastructure, at both farm, agricultural contractor, and merchant level, to achieve some of the measures in the strategy.

- An individual stated that they believed the targets are honourable but need to be achieved without putting farmers out of pocket and out of business.

More information and detail required

- SUMMARY - 10 organisations (6 farming focused, 2 environment focused, 1 water focused, 1 Council) and 76 individuals sought more information and details on the Northern Ireland wide 2030 targets. Further detail from responses is summarised below.

- A farming focused organisation was in support of setting targets but believes that there will be difficulties in achieving those outlined in strategy. It is vital that targets selected are practical, fair, and realistic but those outlined within the draft Strategy are unrealistic and unachievable. Further analysis was sought on how the targets were arrived at and the reason for choosing 2020 as a base year. In addition to environmental targets, in the interests of balance, there should also be a target to maintain sustainable agricultural production at current levels as a result of this strategy. To deliver an Ammonia Strategy, partnership working is essential. A whole industry solution is needed with agri-food processors, feed companies, geneticists, researchers, veterinarians, advisers etc all assisting farmers to deliver ammonia reductions.

- A farming focused organisation were concerned that some of the scientific evidence around these targets has the potential to be flawed and that the effects of, for example, changing weather conditions etc have not been considered in future modelling. Targets must be realistic and achievable to be meaningful, and the process of arriving at them must be clear. A blanket approach has the danger of adding stresses to certain businesses (mainly small family farms) which are unnecessary and ultimately unproductive in attaining the goals of these measures. A Rural Needs Impact Assessment is recommended to inform farmers who will be unduly impacted by the strategy, backed up by data and evidence on its impact, especially on designated sites.

- A farming focused organisation stated that the overarching goal, the need to bring ammonia issues down to acceptable levels, is one that their sector is keen to support. The challenge in supporting the targets however revolves around a substantial lack of clarity around the "how", the "who" and the "by how much" at individual farm level. The organisation asked questions on how the baseline is calculated and how the emission levels have been calculated. Further questions were asked on how improvements are to be calculated; whether at the points of emission or at sensitive receptors, and whether targets are to be split across all sectors and all farms.

- A farming focused organisation asked if the baseline is correct, whether the targets are realistic and achievable, and if there are accurate methods of tracking improvements.

- An environment focused organisation recommended DAERA develop a clearer package of consistently worded targets, representing a coherent and ambitious vision for measurable ammonia reduction in Northern Ireland. They are pleased to see this ambitious commitment appears to include all habitats in Northern Ireland. However, the phrase 'sustainable and pragmatic' is not sufficiently SMART, and they would like to see this replaced by a metric against which progress can be measured. They suggest the timeframe is aligned with other commitments such as the 2040 draft Peatland Strategy.

- An environment focused organisation welcomed the proposed targets and commented that, if successful, these targets will make a significant contribution to reducing the impact of ammonia emissions across NI. To ensure that targets are met it is essential that the proposed strategy is implemented effectively, at pace, and with sufficient resourcing. It is unclear how the strategy will be resourced, raising questions regarding its ability to meet the targets set, and it is unclear whether certain interventions aimed at reducing ammonia will be delivered through regulation, or via incentives. Provision of clarity on mechanisms will be appropriate to achieve desired outcomes. DAERA must effectively apply the polluter pays principle within the strategy which should then guide appropriate interventions.

- A Council sought clarity on the funding arrangements in advance of measures being implemented.

- A water focused organisation stated that, in their view, NI must reduce ammonia emissions in a sustainable way to protect the environment, sensitive habitats and water quality, whilst maintaining a sustainable agricultural sector. While the targets set seem fair and sensible, there is no roadmap for delivery detailed within the document, showing exactly these targets are to be achieved. This draft strategy does not address the challenge of phosphorous which is an issue from the agricultural sector, causing runoff into watercourses and affecting water quality in NI.

- Forty-seven individuals stated that they did not understand the additional limitations, details, and implications; that they had not been given a full view of emissions; and did not have sufficient knowledge of the detail around the targets to be able to comment on them.

- Nine individuals asked about the impact of the Kunming-Montreal Global Biosecurity Framework in relation to the targets.

- An individual stated that this increase in protected site numbers coupled with increased restrictions on slurry spreading from 15 m to within 50 m of these areas will have a

significant impact across the whole of NI, and a reduction in farmland value is likely as it will become less productive.

- An individual stated that targets set in a Strategy should be blended and supported with a roadmap for delivery. NI must reduce ammonia emissions in a sustainable way to protect the environment whilst achieving a sustainable agricultural sector, and this strategy should align with other strategies and roadmaps.

Significant financial concerns cited

- SUMMARY - Campaign response A and 50 individuals cited significant financial concerns. Further detail from responses is summarised below.

- Campaign response A and nine individuals state stated that a reduction in ammonia emission is possible if the financial investment exists, but not all these measures are practical, accessible, or affordable to all farmers particularly small family hill farms in LFA areas.
- Thirteen individuals stated that they have not been involved in the detail and cannot comment on the 30% reduction by 2030 and ask how they can answer this question when they don't know what the effect of the Kunming-Montreal agreement will be for NI and where new restricted areas will be. They asked will happen to their income when this agreement is implemented, the impact on land value, and how plans for housing refurbishment requiring Integrated Pollution Prevention and Control (IPPC) variation will be impacted.

- Twenty-eight individuals asked about the impact on their farm income, the value of the land, their ability to make future financial plans, and stated concerns that small family farms will go out of business.

Not supportive

- SUMMARY - 6 organisations (five farming focused 1 political party/representative) and 23 individuals were not supportive of the targets. Further detail from responses is summarised below.

- A farming focused organisation stated that the targets were unrealistic and unachievable, and that there should also be a target to maintain sustainable agricultural production and not decrease output.

- A farming focused organisation stated that the targets will be very difficult and onerous to achieve for an industry that emits only 12% total ammonia but also produces food for 10 million people, and that reductions must be at a level which does not reduce agricultural production and jeopardise food security.

- A farming focused organisation stated that the targets are unrealistic and unachievable and will have detrimental effects on young people in the industry trying to enter the industry.

- A farming focused organisation stated that the timeframe proposed for the anticipated levels of reduction is too short, and consequently the targets are unrealistic and unachievable given the amount of time that has already been lost. 2040 represents a more realistic time frame, given the magnitude of the targets being proposed.

- A farming focused organisation said the targets are very ambitious, and in the time frame, requiring monitoring, would likely be unachievable. It would be more sensible to set quantitative, measurable targets at the highest level in the next Ammonia strategy – e.g. for 2040 – but for this particular strategy any targets should be focused on actions, possibly outputs, but definitely not outcomes.

- A political party/representative stated that they support the setting of targets but highlight the difficulty in meeting these. A need for reality and practicality within these targets is essential, not unrealistic targets. Targets should be industry led.

- Eighteen individuals commented that the targets were too high, too harsh, not achievable, or unrealistic. A number of these individuals also cited concerns about the impact on small family farms and their own farm business.

- An individual stated that the targets should be over a longer period depending on government support in driving genetics, vaccination programmes, nutrition, and standard housing.

No comments

- Eleven individuals had no comment to make or felt they did have enough involvement in the detail to comment.

Question 2 - What are your views on the proposed pillars of the Ammonia Strategy?

- In total there were 347 responses to this question, of which 26 were from organisations, 177 were from individuals, and 144 were from campaign response A.

- Answers were assigned to five separate categories following consideration. The number of responses in each category is set out in Table 2 followed by summaries of the responses.

Table 2. Number of responses to question 2 by category

Category	Number of organisations	Number of individuals	Campaign response A
Pillars should go further/suggestions made	7	2	
Supportive of the proposed pillars	5	4	
More detail needed on measures, farm level impacts and full RIA	11	153	144
Not supportive of the proposed pillars	1	15	
No comment on the proposed pillars	2	3	

Pillars should go further/suggestions made

- SUMMARY - 7 organisations (5 environment focused, 1 rural focused, 1 water focused) and two individuals suggested the proposed pillars of the Ammonia Strategy should go further. Further detail from responses is summarised below.

- An environment focused organisation suggested designated sites be extended to include ancient woodland and commented that there is no mention of inspections, sanctions, and penalties to drive delivery of the necessary changes.

- An environment focused organisation stated that these measures will only achieve small reductions in emissions, “chipping away at the margins” without addressing the root cause of the problems. A transition to more regenerative farming practices to improve soil health and farm productivity was proposed, with funding moving away from area-based payments towards a Farming with Nature scheme.

- An environment focused organisation stated that the pillars are a great start but could go further to implement a wider range of strategies.

- An environment focused organisation recommended that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia

Strategy. They agreed with the draft Ammonia Strategy being structured around the two pillars of 'an ammonia reduction programme' to cover all of Northern Ireland and more focussed 'conservation actions to protect and restore nature' and noted that the success of Pillar two is dependent upon the successful delivery of Pillar one.

- An environment focused organisation believes these are the right pillars but expressed concerns that actions described in the pillars are not sufficiently ambitious to achieve the targets set out, as the proposed options are on the whole voluntary measures with no clear funding structure proposed and no details of monitoring to determine if outcomes are having the desired effect. Concerns were stated that regulatory measures being put forward are not accompanied by details of monitoring and enforcement to ensure required rates of compliance are being achieved.

- A water focused organisation welcomed a coherent approach to ammonia which can deliver on the targets. Much of the water abstracted for drinking water in N Ireland has its source in upland catchment areas which are sensitive and valuable habitats. These areas are susceptible to damage due to ammonia deposition, which damages habitats and biodiversity, but also can result in poor water quality through runoff from degraded or eroding peatlands. It is essential that these areas are not only protected, but also incentives are put in place, so that these uplands can be restored and enhanced.

- An individual commented that the pillars should not be confined to a few specific sites; farmers should generally be asked to reduce ammonia losses, although problematic sites should be addressed first.

Supportive of the proposed pillars

- SUMMARY - 5 organisations (2 environment focused, 2 farming focused and 1 Council) and 4 individuals were supportive of the pillars. Further detail from responses is summarised below.

- An environment focused organisation stated that these pillars are appropriate, noting that a mixture of target areas is required, and these seem to address the major aspects. It is important to stop damaging pollution as quickly as possible as damage continues to accumulate.

- An environment focused organisation is content with the proposed pillars.

- A farming focused organisation stated that in principle the two-pillar approach seems sensible.

- A farming focused organisation was supportive of the proposed pillars of the Strategy. Infrastructure at a trade/supply chain level may also be required to meet the ambition of the Strategy for on-farm measures.

- A Council agreed that a long-term strategic approach is needed to address ammonia emissions and their impact in Northern Ireland, and these pillars provide a programme of measures that are required to reduce emissions.

- An individual stated that the proposed pillars were the best that can be hoped for given the considerations.

More detail needed on measures, farm level impacts and full RIA

- SUMMARY - 11 organisations (7 farming focused, 2 Councils, 1 environment focused and 1 political party/representative), campaign response A, and 153 individuals sought more details on the proposed measures including the farm level impacts and a full Regulatory Impact Assessment. Further detail from responses is summarised below.

- A farming focused organisation support the two-pillar approach in principle but have significant concerns around the detail presented later in the strategy. They totally oppose the spatially targeted approach and believe it is divisive and damaging to NI farmers.

- A farming focused organisation stated that this consultation must set targets farmers, NIEA, and DAERA agree and understand completely before implementation, including the time period for change to take place; and asked why farmers believed to affect sites were not involved in Conservation Management Plans.

- A farming focused organisation commented that the two pillars appear a sensible starting point but in their view are incomplete. Pillar 1 should include the requirement that measurements applied to calculate reductions from the baseline must be accurate. They questioned whether measurement factors are up to date or accurate and stated that the reduction programme needs to deliver a just transition for farmers where no individual farm or sector is allocated an unjust set of reductions.

- A farming focused organisation fully support continued development of the science and innovation agenda around this topic but often feel the science can be ‘single issue’ in approach, and the wider practicalities of how farms operate are missed. This very often results in intended consequences. They would like to see more research that is ‘whole farm’ in its approach and also considers the smaller family farm structure and solutions this provides to many of the issues related to highly intensive agriculture. There is a need to ensure that we as an industry do everything to support farmers to understand the changes required, educate, and most importantly fund the change at a level that encourages uptake that is sufficient to meet our UK commitments.

- A farming focused organisation stated that the two pillars of the in their view are incomplete, citing the need for accuracy in calculation of reductions from the baseline and measurement factors. Concerns were expressed that a 50 m non slurry spread requirement may tip more poultry businesses into restricted site status by virtue of proximity of their land (within 50 m of the designated site).

- A Council stated that the primary aim of the reduction and remediation measures around and within designated sites should be to restore and maintain valuable habitats and not to create ‘headroom’ for new/additional ammonia emitting activities; further development must be subject to rigorous scientific based assessments.

- A Council encouraged DAERA to widen the scope of the pillars to include an island wide, joined up approach given that some designated sites extend into the Republic of Ireland (RoI). DAERA should also consider a third pillar to ensure farm business are protected and sustainable in the long term. They noted the potential for a very significant impact arising from the proposals on farms and believe this will result in a disproportionate impact on farms in LFAs. They called for a full Rural Impact Assessment to inform measures to support farms in these areas.

- A political party/representative principally support the pillars but expressed concerns regarding some details in the strategy and oppose spatial targeting due to it being divisive and damaging to farmers.

- An environment focused organisation welcomed the moves to focus on efforts to reduce emissions directly through pillar one and two. However, they were unclear what mechanisms DAERA will introduce to ensure they are taken up by the majority of farm businesses. The strategy’s strong focus on technological solutions to addressing the issue could prove problematic if they are not as effective as originally anticipated. A reliance on technology that doesn’t yet exist may distract from other changes that could deliver the same outcome, such as a shift to agroecological farming.

- Campaign response A and 25 individuals noted DAERA’s comments; a ‘very significant’ impact on farms impacted by the regional wide strategy to reduce ammonia or ‘spatially targeted’ measures or both, in addition to the development of a new operational protocol being addressed separately from this consultation. Their response said the impact is disproportionate on farms in Less Favoured Areas and recommended a full Rural Impact Assessment to inform what will work and not work for farms disproportionately impacted by these draft policies.

- Eighty-seven individuals stated that there are too many unknowns for them to make a comment or decision, and that they did not know what standards were expected of their farm.

- Twelve individuals responded that the proposed plan seems to have a logical direction, but there were still many details that need to be worked out between regulators and farmers within the plan's framework. Any targets set for farmers must be agreed upon and fully understood before implementation, including the timeframe for change.

- Individuals also asked detailed questions about the specific impacts of measures on their farms.

Not supportive of the proposed pillars

- SUMMARY - 1 farming focused organisation and 15 individuals were not supportive of the pillars. Further detail from responses is summarised below.

- The farming focused organisation stated that, by their nature, these pillars will make certain farms valueless, and this should be recognised in the strategy, together with an indication of how farming businesses will be compensated for any consequential loss of value.

- An individual stated that it was good to have ammonia reduced but not fair on farmers close to designated sites to be targeted.

- An individual stated that the draft "ambitious and verifiable ammonia reduction plan" means expensive, economically damaging, and onerous demands on businesses near designated sites and in intensive agriculture.

- An individual stated that they would like to see a realistic target for their farm as its own entity. The pillars proposed are not realistic due to the size proposal which will span into multiple farms. They would like assurance that each farm has its own responsibility and isn't impacted by neighbouring farms.

- An individual stated that the pillars do not align with the need for reduction of ammonia in focused areas despite the strategy clearly outlining that intensive sectors create most of the ammonia emissions, leading to punishment for all as a result of a smaller number of large farms. The strategy should reconsider the impact on small farms and acknowledge use of LESSE is not the means of achieving larger emissions. As the document states it should focus on: elimination or significant reduction of 365 day housing for both dairy and beef systems contributing 57% more emissions than the grazed systems; and a reduction in total livestock numbers in NI. The strategy should be focusing on changing agri-activity to encourage other systems eg mixed farm units with cereal based activity to mine surplus P and reduce ammonia at the same time.

- An individual commented that the measures are too ‘one size fits all’ in approach and, as with most climate change rhetoric, focus on the impacts from agriculture which in comparison to industry, commerce, transport etc, is miniscule.

No comment on the proposed pillars

- One farming focused organisation, 1 Council, and 3 individuals had no comment to make on the proposed pillars.

Question 3 - What are your views on how DAERA will enable this strategy?

- In total there were 352 responses to this question, of which 28 were from organisations, 180 were from individuals, and 144 were from campaign response A.

- Answers were assigned to seven separate categories following consideration. The number of responses in each category is set out in Table 3 followed by summaries of the responses.

Table 3. Number of responses to question 3 by category

Category	Number of organisations	Number of individuals	Campaign response A
More urgency needed	5		
Qualified support	4	1	
Need for a strategy budget/financial concerns cited	8	11	
More information/clarification and alignment with other strategies sought	8	121	
Need for full RNIA, EQIA, consideration of LFAs	1	31	144
Not supportive		11	
No comment	2	5	

More urgency needed

- SUMMARY - 5 organisations (4 environment focused, 1 rural focused) sought more urgency in implementation and delivery of the strategy. Further detail from responses is summarised below.

- An environment focused organisation felt the strategy needs more force behind its implementation and delivery than the term support implies. Ammonia reduction is such a critical matter for environmental and human health that farmers should be more aware that implementing these measures is crucial and must be given utmost priority if enforcement is to be avoided.

- An environment focused organisation commented that much more specific, targeted and 'SMART' actions are required. A comprehensive mixture of information/communication of best practice, financial incentives and strong disincentives, and the necessary underpinning of legislation and regulation (monitored and rigidly enforced) is required.

- An environment focused organisation cautioned against an over reliance on emerging technologies to reduce ammonia emissions within the short timeframe of the strategy (5

years) and the need for targets to be achieved by 2030 (7 years). They would like to see priority given to support for farmers to deliver existing proven farm measures, including appropriate funding and advice.

- An environment focused organisation responded that the final strategy needs to convey a greater sense of urgency, reflecting the linkages to both the climate and biodiversity emergencies.

- A rural focused organisation stated that it was unclear that the strategy, which appears to be totally voluntary, will achieve the level of reduction in ammonia sought by the Department.

Qualified support

- SUMMARY - 4 organisations (2 Councils, 1 farming focused, 1 environment focused) and one individual had qualified support for how DAERA proposes to enable the strategy. Further detail from responses is summarised below.

- A Council agreed that supporting science and innovation will inform best practice on delivery of the targets.

- A Council agreed that an innovation agenda that informs best practice on delivery of the targets is required and that the necessary support should be made available. In addition to farmers, this should also involve all the associated stakeholders, including the planning department for example.

- A farming focused organisation responded that they agree with, and support, the enabling measures that DAERA proposes and suggest that these should be added to with discussion and co-operation with trade stakeholders.

- An environment focused organisation responded that, while welcoming the intention to support specific knowledge transfer sessions for such ammonia reduction technologies, high quality monitoring and advice is essential for effective and targeted action to tackle emissions and should be integrated into the Farming with Nature advisory scheme with additional funding provided, including extending CAFRE workshops to include the implementation of nature-based solutions and adaptation of on-farm practices eg steps to reduce fertiliser usage, trial cover crops, minimal and no-till operations.

Need for a strategy budget/financial concerns cited

- SUMMARY - 8 organisations (7 farming focused, 1 political party/representative) and 11 individuals cited financial concerns in relation to the strategy. Further detail from responses is summarised below.

- A farming focused organisation are comfortable with DAERA's proposals for enabling the Strategy, but it must be accompanied by a budget for the enabling process – detail which is currently missing.

- A farming focused organisation were supportive of the approach outlined however DAERA need to identify and commit a budget to the delivery of this strategy.

- A farming focused organisation stated that, if any progress is to be made, the Enabling Actions should have a significant monetary expenditure attached to them. The Green Growth Capital Investment Plan is subject to confirmation. They encouraged DAERA to think about the practical and legislative barriers needed to overcome the perception (and reality) that often, planting land in trees is financially risky for farmers and landowners.

- A farming focused organisation support these measures in principle however the concern is that they are all expensive to install, especially at a time when farm incomes are low, and the reliability of future farm support is uncertain. All these items are considerable capital investments, and some are difficult to retrofit. Others have extremely high running costs and will not only add to the farm overheads but also increase farm carbon footprint through additional energy use. Planning regulations around the replacement of existing buildings with more efficient buildings must be reviewed.

- A farming organisation are very concerned about the lack of a budget to implement the strategy.

- A farming organisation welcomed DAERA's support for a science and innovation agenda that informs best practice and support for farmers to deliver changes, provided sufficient budget is made available to do so, and noting that within the consultation document there is no mention of budget or what kind of schemes will be supported.

- A political party/representative responded that, as there are no firm commitments on schemes or budget in this strategy, this undermines the entire strategy.

- An individual proposed lowering single farm payments but giving the same income to drive efficiency payments.

- Ten individuals cited the need for financial support, grant funding, provision of advice, detail on the proposed budget for the strategy and consideration of the financial impact.

More information/clarification and alignment with other strategies sought

- SUMMARY - 8 organisations (4 farming focused, 3 environment focused, 1 water focused) and 121 individuals sought further information and clarification and cited the need for alignment with other strategies. Further detail from responses is summarised below.

- Two farming focused organisations were supportive of the approach outlined while noting the need for DAERA to identify and commit a budget to the delivery of this strategy. They commented that the strategy has 5-year cycles and there are multiple strategies / regulations already in place with review cycles, few of which are synchronized. The Nutrients Action Programme is reviewed every 4 years, the Climate Action Plans every 5

years, and Water Framework River Basin Management Plans every 6 years all starting in different years. Each of these will have linkages to ammonia policy. This causes confusion and results in a lack of joined up policy agenda and a need for a more coherent approach.

- A farming focused organisation stated that all decision making must be based on sound verifiable science. They asked: “if ammonia emissions are deemed to affect the ROI or Scotland how will you ensure that their emissions do not affect us?” They need sound advice, timescales, and details of financial assistance and also expressed a need for environmental regulators to talk to farmers on their own farms and explain the issues fully, using evidence which they can understand, to together reach an understanding of how issues can be mitigated.

- A farming focused organisation welcomed the commitment to developing a pathway based on the science with the desire for science and innovation to inform best practice on delivery and were keen to ensure, through development of the stakeholder group, “agreed” best practice with the industry prior to seeking adoption on farm. Investment in development of science and innovation also applies to the science necessary to update emissions factors following mitigations so that measurement can be re calibrated against the baseline. The example ammonia dispersion cited in relation to a 7.5 km screening distance is based on point-source emissions from 27 years ago, and point sources for poultry have reduced substantially since then due to improved production methods. Consideration of extending screening point should be based on the latest science. Information was sought on cross-jurisdictional plans to control ammonia emissions at source (whether wet or dry) which could impact upon land areas within NI.

- An environment focused organisation recommend DAERA publishes a comprehensive action plan for the delivery and evaluation of the final Ammonia Strategy and the 2030 targets, setting out a long-term roadmap for achieving the 2050 emissions target, considering a wider range of drivers and pressures. They recommend DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy, noting that coherence between the final Ammonia Strategy and related policies and strategies in Northern Ireland is vital for successful delivery. The final Ammonia Strategy needs to clearly align with the Future Agricultural Policy, Climate Change Action Plan, Peatland Strategy, and Biodiversity Strategy.

- An environment focused organisation stated that while some proposals provide a clear outline on how the strategy will be implemented (e.g., new regulation on slurry spreading), others are lacking in detail (coverage of slurry storage, implementation of agroforestry), which risks action in some areas being undermined by a lack of progress in others. There is no detail on how the strategy will be resourced which is critical to its success. DAERA should outline the anticipated spend in implementing all interventions in the, covering regulation, enforcement, knowledge exchange, advice, and delivery of incentives.

- An environment focused organisation acknowledged the evidence and research in the draft strategy but were concerned that many proposals are aimed at minimising effects of ammonia being produced rather than stopping it being produced. They cautioned against an over-reliance on technological solutions on innovations, as these must be taken forward in tandem with a pro-active approach to nature-based solutions and regenerative farming

practices, which tackle the root issue of the ammonia being produced and are therefore more sustainable in the long term. The importance of enabling this strategy by supporting farmers to deliver change cannot be over-stated. One of the most important ways for DAERA to enable this strategy is by ensuring policy coherence with other key departmental and Executive strategies including the Future Agricultural Policy, Environment Strategy, Peatlands Strategy, Biodiversity Strategy and the Green Growth Strategy. A key missing element in the overall policy road map for Northern Ireland is a co-created over-arching Land Use Framework which would provide a clearer understanding of the optimum uses of our land resource to achieve sustainable outcomes for nature, climate, and society.

- Seventy-three individuals stated that all decision making must be based on sound verifiable science and evidence, with a system/procedure that all parties agree upon as 'best practice' from management, understanding and cost perspectives. To this end continued support from DAERA/AFBI research programmes is essential. Many individuals asked about the effect of ammonia emissions moving between NI, ROI, and Scotland. The need for discussion with environmental regulators was also mentioned.

- Four individuals would like confirmation that if they do x and y, that it will be acceptable, as currently the document does not provide them with a clear picture of where their future lies. They asked environmental regulators to fully explain the evidence-based issues using language they understand so they can reach an understanding of how they can mitigate issues.

- Individuals also asked about the impact on their farm; how they could know what their emissions are; and if DAERA would provide a plan of what needs to be done to meet requirements.

Need for full RNIA, EQIA, consideration of LFAs

- A Council, campaign response A and 31 individuals were supportive of plans to enable the strategy through science and innovation and call on DAERA to prioritise funding and full financial compensation for the agricultural sector to support farmers to meet targets. DAERA must also ensure that its statutory obligations in relation to the Rural Needs Act 2016, Human Rights Act 1998 and statutory equality obligations in relation to section 75 groups are met. The Council has concerns that there are shortcomings in the Department's Rural Needs Impact Assessment and equality screening templates. The Council supports logical, practical, and well thought out policies and legislation that meet the needs of farmers and take account of specific farm characteristics, alongside enabling sustainable local food supply. There should also be a detailed plan for communication and education in relation to ammonia, its effects, and the measures to be rolled out, to enable successful delivery of the strategy.

Not supportive

- SUMMARY - 11 individuals were not supportive of how DAERA proposes to enable the strategy. Further detail from responses is summarised below.

- An individual stated that farmers need to be able to spread slurry and manure all year round so there is a better approach to applying it instead of it all going out at once when bans are lifted.

- An individual stated that DAERA should be educating farmers, but the biggest problem is farm policy.

- An individual stated that they were deeply concerned about the implementation of the proposals and how they will be governed.

- Other individual responses were not supportive, and a number were critical.

No comment

- Two organisations (1 Council and 1 political party/representative) and 5 individuals had no comment to make on this question.

Question 4 - Do you have any comments on the proposals for low emission livestock housing?

- In total there were 352 responses to this question, of which 28 were from organisations, 180 were from individuals, and 144 were from campaign response A.

- Answers were assigned to seven separate categories following consideration. The number of responses in each category is set out in Table 4 followed by summaries of the responses.

Table 4. Number of responses to question 4 by category

Category	Number of organisations	Number of individuals	Campaign response A
Need for urgency		2	
Support or qualified support	4	24	
Must be economically viable and supported	12	136	144
More information/detail sought	7	7	
Need for full RNIA, EQIA, consideration of LFAs	5		
Not supportive	4		
No comment	3	4	

Need for urgency

- Two environment focused organisations stated that proposals for low emission livestock housing should reflect the need for urgency, and that the option to make the measure mandatory be retained.

Support or qualified support

- SUMMARY - 4 organisations (2 environment focused, 1 political party/representative and 1 water focused) and 24 individuals were supportive of, or had qualified support of, the proposals. Further detail from responses is summarised below.

- An environment focused organisation welcomed DAERA's consideration of the principle of low emission livestock housing and is broadly supportive but had no detailed technical comments to make.

- An environment focused organisation recommended that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia

Strategy. The management and application of manure from livestock housing is highlighted as the principal driver of ammonia emissions in Northern Ireland. The solution pathways are based on increasing uptake and knowledge transfer of ammonia reduction measures.

- A political party/representative stated that low emission livestock housing should become the standard for the Northern Irish farming and DAERA should be considering a legislative approach where, from a certain point, all new proposed livestock housing needs to be built to be low emission. The proposal for financial support (via the Green Growth programme) to retrofit existing livestock housing is a good initiative, and more support for low emission livestock housing can only be beneficial.

- A water focused organisation were supportive of low emission livestock housing but only for use during periods when grazing is not appropriate. Construction of further 365-day housing units should not be supported given the increase in ammonia these systems introduce and that these units should be actively discouraged due to the volume of slurry they produce.

- Fourteen individuals responded that new housing and refurbishments should be built to the best or highest possible standards to reduce ammonia emissions and use new technologies.

- Two individuals supported low emission housing, as long as the housing period was not increased.

- An individual stated that NIEA currently approach this as BAT (Best Available Technique) which they agreed on.

- An individual stated that refurbished houses must be able to show a reduction in ammonia levels, but not at the cost of reducing livestock numbers.

- An individual thought this was very worthwhile, and that further technological improvements will lead to further advantages for low emission livestock housing.

- An individual stated that existing buildings/sites should not be expected to reach the expectations of new buildings. It is reasonable that existing buildings should try to lower their emissions in relation to their existing emissions as accepted under the BAT IPPC procedure. Livestock numbers should not need to be reduced. They asked why large biodigesters have not been suggested for cattle slurry ammonia reduction in the strategy.

Must be economically viable and supported

- SUMMARY - 12 organisations (7 farming focused, 3 Councils, 1 environment focused, 1 political party/representative), campaign response A, and 136 individuals stated the need for the proposals to be economically viable and supported. Further detail from responses is summarised below.

- A farming focused organisation stated that grants need to be available to build low emission livestock housing facilities and convert current houses to low emission housing, and planning permissions need to be freely available for low emissions housing. Advisory services are needed on livestock housing.

- A farming focused organisation stated that every new build or refurbished farm should include an appropriate, cost-effective system/work practice approved to lower ammonia emissions. Variations which lower emissions from existing sites should be viewed as a reduction in relation to existing emissions. New housing should be built to the best, economically viable environmental standards for ammonia reduction. Refurbishments must be able to show a reduction in ammonia levels by at least 40% with the same livestock numbers.

- A farming focused organisation stated that installing new technologies in buildings is likely to be very challenging with potentially very significant costs. Technology must be accepted by NIEA and appropriate emission factors used.

- A farming focused organisation noted the need for new housing technology to be affordable and adaptable, and asked how smaller units can afford to finance these major changes and get over planning permission issues.

- A farming focused organisation stated the need for adequate funding and their belief that separation of slurry, and removal of solid slurry separate to local biogas plants, could have a major role to play in this area. The strategy should consider this technology as a priority alongside the technologies listed.

- A farming focused organisation recognised that technology has a vital role to play in reducing ammonia emissions but expressed concerns with high costs associated with technology, refitting existing buildings with this technology, and planning rules which may restrict or prevent development and limit ammonia reductions. Potential health and safety issues with some measures were noted such as the potential for the buildup of slurry gases with slat flaps.

- A farming focused organisation commented that many farms across Northern Ireland are crying out for renovation of livestock housing or rebuilding due to poor farm gate prices.

- A Council stated that many ammonia reduction technologies in housing will require ongoing management to achieve and maintain predicted reductions in emissions, and that ‘confidence in management’ should be a critical test in any financial scheme supporting implementation.

- A Council stated that the proposals will require substantial financial commitment and all measures need to be supported by way of full financial funding to the agricultural sector, with building design key but supported by appropriate education and training on the efficacy of existing, new, and emerging management practices.

- A Council recognises and agrees that farmers require support to install ammonia reduction technologies in livestock housing through financial assistance. The Council also have the

view that training delivered by DAERA is required, not only to farmers, but also others such as planning authorities who may need to assess and approve such housing.

- An environment focused organisation supported the proposals but stated that if they are to have any appreciable effect, even in the short term, the cost and speed of retrofitting will be slow and prohibitive. Low emission housing design and construction must be compulsory for new builds and more encouragement and support needs to be provided for retrofitting.

- Ninety-one individuals cited the need for cost effectiveness and economic viability in the proposals for low emission housing.

- Campaign response A and 26 individuals responded that the proposals will require substantial finance, however, they were aware that most large-scale intensive agriculture units will already have some of these measures as part of planning permission.

More information/detail sought

- SUMMARY - 7 organisations (4 farming focused, 2 environment focused, 1 rural focused) and 7 individuals sought further information on the proposals. Further detail from responses is summarised below.

- A farmer focused organisation accepts that technology has an important role to play in delivering reductions in ammonia emissions in NI. While there are many technologies and techniques that could be adopted, these will range in acceptability and affordability and the practicalities of adopting such technologies will vary between farms and sectors. It is vital that DAERA properly evaluate current technology being used on farms and update the ammonia inventory accordingly. Creation of an accurate baseline is vital. DAERA rely on the Farm Business Investment Scheme (FBIS) data in relation to uptake however there are large numbers of farmers who have adopted technologies to deliver animal health, welfare and productivity improvements that will not be recognised by DAERA and will contribute to ammonia reductions e.g. slat mats and scraper systems are common and the widespread use of these must be measured and included in the ammonia inventory.
  It is concerning that there is not an appropriate emission factor for slatted housing as it dominates NI livestock systems. It is recognised by Teagasc that slatted floors are estimated to reduce ammonia emissions by 36% compared to solid floors yet this is not currently recognised in the NI inventory.
  Retrofitting buildings is likely to be challenging as some technologies can be fitted to existing accommodation but this may not always be practical. It may be more beneficial and cheaper to build new modern facilities with appropriate ammonia measures in place. Where new buildings are required to adopt new technologies, planning rules may restrict or prevent development and therefore subsequent ammonia reductions. This must be addressed within the revised NIEA Operational Protocol. Betterment must be recognised as vital to allow the industry to adapt and improve to deliver further reductions. Many technologies that deliver ammonia reductions have very significant costs. Costs of installation and running costs could make the project/ business unviable even with Government support. There are concerns that useful technologies available are often not accepted by NIEA and it takes too long for decisions to be made. Most measures will not provide financial or production benefits to farmer therefore are not economic to introduce.

- A farming focused organisation questioned whether current emission factors fully reflect technologies currently in use across farms and if they are properly recognised within the planning process.

- A farming focused organisation asked for more information on: whether the inventory includes below ground slurry storage; significant health and safety risks not addressed in the Strategy; government funding; and research to demonstrate and verify the effect of slatted floors on the ammonia inventory.

- A farming focused organisation stated that it is unclear how individual livestock houses are to be assessed to determine the level of remediation investment required. Clarification was sought on practice within Environmental regulation (under IPPC permits) in relation to BAT and allowances for existing buildings that may find some technologies harder to adopt than new builds.

- An environment focused organisation stated that evidence provided in the draft strategy highlights the important role low emission livestock housing can play. They felt the proposals were vague and recommend DAERA put forward a date by which all relevant housing will need to meet clearly defined standards, providing an impetus for change and allowing farmers to receive financial support during transition.

- An environment focused organisation stated that solutions such as scrubbing while appearing good on paper have faced criticisms in countries where deployed extensively. Despite the high cost and emission reducing potential they often prove unsuitable in practice due to ongoing maintenance. There is no guarantee that such systems would be maintained to a standard to ensure continued reduction in emissions. Any technology recommended needs to ensure that they will be maintained and are equally appropriate under Northern Irish conditions. Many emission reductions suitable for housing need to be followed up by subsequent approaches in the manure management chain. If emissions are reduced when animals are housed, it can increase the amount of ammonia potentially volatilised during spreading. The full manure management chain needs to be considered when weighing options for emission management.

- A rural focused organisation stated that technologies proposed for low emission livestock housing may be of considerable size and have the potential for significant impacts which may be beyond agricultural permitted development rights and require full planning permission and accompanying environmental reports and assessments including the storage of hazardous materials. This could have an impact on neighbouring amenity, nuisance due to noise, odour, air and water pollutants and visual impacts on rural character.

- An individual stated that more emphasis should be put on reducing ammonia from pigs and poultry rather than ruminant animals: the consultation is totally focused on cattle; a much more balanced approach should be taken.

- An individual commented that the cost and environmental impact of producing slat mats greatly outweigh the marginal benefits they bring to the environment; it is better to convert

solid floors to slatted channels with grooved slats to improve urine runoff and grip for cows' feet. They would also include rainwater harvesting and storage as additional water to dilute slurry will reduce ammonia emissions during spreading.

- An individual asked why large scale biodigesters for cattle were not suggested as a solution.

- An individual asked if farmers who have already lowered emissions will be required to reduce them further.

- An individual stressed the importance of manufacturers of any proposed technologies providing test results for the performance of their relevant item. They stated that current information seems to be very general with the 'potential to reduce' rather than evidence of reductions.

Need for full RNIA, EQIA, consideration of LFAs

- Five individuals were supportive of how DAERA would enable the strategy but cited concerns relating to the Rural Needs Act 2016, the Human Rights Act 1998 and Equality duties under Section 75.

Not supportive

- Four individuals were not supportive of the proposals.

No comment

- Three organisations (1 farming focused, 1 environment focused and 1 Council) and 4 individuals had no comments on the question.

Question 5 - Do you have any comments on the proposals for emerging technologies?

- In total there were 341 responses to this question, of which 30 were from organisations, 167 were from individuals, and 144 were from campaign response A.

- Answers were assigned to seven separate categories following consideration. The number of responses in each category is set out in Table 5 followed by summaries of the responses.

Table 5. Number of responses to question 5 by category

Category	Number of organisations	Number of individuals	Campaign response A
Need for urgency	1		
Supportive of the proposals		8	
Financial support required		5	
Technologies must be proven and cost effective/ suggestions made	25	139	144
The potential role for anaerobic digestion (AD)	2		
Not supportive		9	
No comment	2	6	

Need for urgency

- One environment focused organisation stated that the proposals are appropriate but must be introduced with an appropriate sense of urgency, based on best available science and practical research with new technologies introduced as they become available.

Supportive of the proposals

- Eight individuals were supportive of the investigation and the implementation of emerging technologies.

Financial support required

- Five individuals had the view that the proposal would require substantial finance and continued government support, and that few could justify the technologies financially.

Technologies must be proven and cost effective/ suggestions made

- SUMMARY - Twenty-five organisations (13 farming focused, 6 environment focused, 3 Councils, 2 political parties/representatives, 1 water focused), campaign response A, and 139 individuals held the view that emerging technologies must be proven and cost effective. Further detail from responses is summarised below.

- A farming focused organisation stated that emerging technologies will be vital to help tackle ammonia emissions from farms. They support further investigation of new technology and welcome the horizon scanning study commissioned by DAERA. They recognised opportunities but reiterate the potential for unintended consequences through, for example, slurry acidification where further information is needed on impacts on soil fertility and health. Other slurry additives also need further consideration and have potential to be cost-effective mechanisms to deliver ammonia reductions. Slurry bags should also be considered. In addition to DAERA verifying the environmental benefits and potential unintended consequences, it is vital that the economics and practicalities of adopting technologies on commercial farms are also examined. DAERA / NIEA must move away from a risk averse attitude and allow farmers to trial more new and innovative technology. A more streamlined process is required for the innovation process to work and there is a real need to get all agriculture sector players sector involved with science and innovation submissions. DAERA should maximise funds and deliver to the private sector to enable them to innovate and better engagement is needed within NI to facilitate this process. Support will be needed to develop and trial new technologies on commercial farms. The industry should work in partnership with Government and researchers to progress adoption of innovative technologies.

- A farming focused organisation supported emerging technologies in principle while noting that initial costs and future running costs must be a key consideration as well as unintended consequences such as increases in carbon footprint, and the impact of acidification of slurry on soil biology. It is essential that research make its way from the research stage to on-farm trials in a timely and supported fashion.

- A farming focused organisation sees technology as a key enabler in supporting farmers and the Northern Ireland agricultural sector to achieve Strategy objectives including implementation of proposed ammonia reduction measures. They suggest greater emphasis be given in the strategy to measures that support farmers in achieving greater precision in application of nutrients to crops (including grassland), and data to support management decisions.

- A farming focused organisation stated that science and innovation have a key role to play in developing and validating new and emerging technologies critical to delivering further ammonia reductions. Many commercial companies are involved in world leading R&D in this space, and it is incumbent on DAERA to further incentivise these efforts by clearly and transparently laying out the process for accepting, validating, and crediting technologies, products and solutions robustly and quickly. It is welcome that DAERA have commissioned a horizon scanning study to seek and review novel approaches for ammonia reduction across the globe and consider cost effectiveness of such approaches, but practicalities and potential unintended consequences must also be factored in e.g. slurry acidification impact on soil health. Further research on slurry additives should be progressed quickly as they

are already being used on farms in NI and offer other agronomic benefits so could represent a cost-effective multi-benefit solution.

- A farming focused organisation were glad to see DAERA encourage emerging technologies, as implementation and demonstration of these technologies is vital for future success. They encourage all emerging technologies to be properly trialled on private sector farms (i.e. not just AFBI and CAFRE farms) as this can lead to significant increase in take up if technologies are successful.

- A farming focused organisation stated that emerging technologies need to be funded by government if it is to be viable for all producers, given the family sized structure of Northern Ireland farming, and stated their support for viable and workable solutions which fit our circumstances.

- A farming focused organisation responded that innovation is how we will beat climate change and every effort needs to be applied and funded in this direction.

- A farming focused organisation asked if there is any research to support Foliar Nitrogen Application in a Tow and Fert system as this as a lower emissions system and stated the need for more research on slurry additives, manure additives, and management.

- An environment focused organisation responded that technology-focused solutions to low emissions farming will be an important part of the solution but must be balanced with deployment of proven practices of nature-based solutions and mitigation of unintended consequences. Technologies should be adopted using the precautionary principle and should not be factored into emissions reductions plans until they have been shown to be effective.

- An environment focused organisation was supportive but said the benefits from product development are too far down the line to make much impact by 2030.

- An environment focused organisation welcomed the commitment to harness new technology and innovation and keep abreast of research, but it needs to happen in tandem with a pro-active approach to all actions and approaches currently available, including widely beneficial nature-based approaches and regenerative farming practices. Given the scale and urgency of the challenge it would be unwise to pin hopes on future technologies which may not translate into reality. They stress the importance of verifying environmental benefits and avoiding unintended consequences of emerging technologies.

- An environment focused organisation welcomed consideration of this issue and flag up the need for the carbon impact of emerging technologies to also be considered.

- An environment focused organisation noted that while technology has a role to play in reducing emissions, there is a risk it distracts from other solutions that can deliver reductions in line with other benefits such as biodiversity recovery, improvements in soil health and water quality. The focus of the proposed technologies tends to be on supporting the continuation of intensive production rather than supporting a shift towards more agroecological farming systems. They recommend that DAERA invests further research in

these areas in a Northern Ireland context, to build on a growing evidence base which is demonstrating the benefits that a shift to these types of farming practices can bring.

- An environment focused organisation recommends that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy

- A Council agreed that all available scientific evidence must be fully considered to verify the environmental benefits and avoid any unintended consequences.

- A Council supports the investigation and implementation of emerging technologies, commenting that emerging technologies will be easier to incorporate into new buildings and implications for existing long-established buildings needs to be carefully considered. The Council urge DAERA to ensure that the methodologies for emerging technologies are robust and verifiable, clearly demonstrating the required ammonia reduction prior to implementation. The Council have concerns with some methodologies for emerging technologies that have been presented to support planning applications and would query whether they actually deliver benefits purported.

- A Council are of the opinion that ammonia reduction technologies should not have unacceptable unintended consequences elsewhere in the environment, in particular, emerging evidence on the impact of acidified or lower pH slurry on soil health should be monitored. As technologies evolve, new tools for ammonia reduction are likely to emerge and be taken into consideration through research programmes and, the Council would be of the view that it is imperative that DAERA provide all the necessary support to those stakeholders who are associated with such schemes.

- A political party/representative commented that DAERA seeks to encourage the development and implementation of emerging technologies for ammonia reduction; this is the most exciting element of the proposal and if done right will have massive potential, therefore they support such measures.

- Forty-four individuals responded that DAERA and AFBI are important cogs in ensuring that new equipment is thoroughly tested and improved, however they also noted some issues arising in relation to standards accredited to ammonia mitigation equipment from other European countries, slowing down progress in reducing ammonia emissions.

- Twenty-one individuals support the investigation and the implementation of emerging technologies, of whom nine also stated that financial support will be required to develop and trial new technologies on farms and that DAERA should work in partnership with farmers to progress the adoption of new emerging technologies.

- Campaign response A supports investigation and the implementation of emerging technologies, stating that financial support will be required to develop and trial new technologies on farms. DAERA should work in partnership with farmers to progress adoption of new technologies.

- Six individuals wish to see continued governmental and regulatory support for the Ammonia Research Programme in assessment of current and future technologies. A proactive

approach towards assessment of emerging technologies would be a working group with industry so that all technologies could be assessed pragmatically with consideration of biosecurity, animal welfare and economic viability. It is essential that DAERA/AFBI continue this relationship with industry and provide the independent research required to give confidence in adopting new technologies.

- Four individuals felt that a working group with industry would be a proactive approach towards assessment of emerging technologies considering biosecurity, animal welfare and economic viability.

The potential role for anaerobic digestion (AD)

- SUMMARY - Two AD focussed organisations outlined the potential role for anaerobic digestion. Further detail from responses is summarised below.

- An AD focused organisation stated that there are a wide range of technologies within the AD sector which reduce ammonia emissions and enhance efficiency of digestates as fertiliser. Acidifying feedstocks, especially slurry and manure, has been found to reduce ammonia emissions by lowering pH of digestate to prevent ammonification. This could be an avenue DAERA should explore and consider how funding and regulatory approaches could encourage acidification. The addition of nitrification inhibitors prevents immobile ammonium being converted into mobile nitrate, preventing N leaching. Acidification and nitrification of digestate keeps the material within the pH range required by plants to absorb nutrients so has little impact on crop/ plant growth. Nitrified liquid digestate also has the advantage of being odourless. With support for the processing of digestates, municipal organic wastes can be converted into high-grade fertilisers. Ammonia stripping of certain organic wastes is beneficial to the anaerobic digestion process. Other cutting-edge research, such as the use of electrical plasma treatment to reduce ammonia volatilisation from digestates, is in the early stages of research and could revolutionise ammonia mitigation from the AD sector. Regulations that enforce one particular route to ammonia emission mitigation may stifle research and development, particularly those that seek to valorise digestate such as nitrification, pelletisation and acidification. DAERA is encouraged to take a holistic and flexible approach which examines mitigation measures on a case-by-case basis.

- An AD focused organisation commented on the use of AD in helping address the challenge of managing poultry litter in Northern Ireland in a more environmentally friendly and sustainable manner through diverting phosphorus in litter away from agricultural land. A combination of anaerobic digestion and nitrogen stripping technology is helping reduce ammonia emissions from agriculture. The nitrogen stripper utilises sulphuric acid in its process which results in the creation of an ammonia sulphate solution that is exported for use as a concentrated liquid ammonium fertiliser that replaces artificial nitrogen fertiliser. This helps to address environmental challenges associated with excess nutrients by exporting phosphorus and nitrogen away from agriculture in Northern Ireland to markets with a demand for these valuable nutrients, thereby creating sustainable circular economy benefits. AD technology also has an important role to play in the fight against climate change as it can reduce Greenhouse Gas Emissions (GHG). Replacing fossil fuels with renewable energy generated in this manner reduces GHG emissions. In this way, diversion

of animal manures, that are already generated in Northern Ireland, to proven AD treatment would be a significant environmental benefit relative to current practice, particularly AD plants with capability to help abate phosphorous and ammonia nutrient excesses in Northern Ireland agriculture.

Not supportive

- Nine individuals were not supportive of emerging technologies. Reasons included costs, the 2030 deadline being too close to wait for them to arrive, that they are financially out of reach for small farms, the need for more input from private sector industry, and that technology already in place in other areas of the world should be used rather than reinventing the wheel.

No comment

- Two organisations (1 environment focused, 1 Council) and 6 individuals had no comment on this question.

Question 6 - Do you have any comments on the proposed additional progression point in the move towards LESSE adoption requiring slurry which is being exported between farms to be spread by LESSE from 1st January 2025?

- In total there were 321 responses to this question, of which 27 were from organisations, 150 were from individuals, and 144 were from campaign response A.

- Answers were assigned to eight separate categories following consideration. The number of responses in each category is set out in Table 6 followed by summaries of the responses.

Table 6. Number of responses to question 6 by category

Category	Number of organisations	Number of individuals	Campaign response A
Need for greater urgency	4	1	
Supportive of the proposal	3	62	
Qualified support	3	5	
Further suggestions made or matters raised	4	3	
Concerns about impact on small farms	6	38	144
Financial concerns		11	
Not supportive of the proposal	3	14	
No comment	4	15	

Need for greater urgency

- SUMMARY - Four organisations (3 environment focused and 1 political party/representative) and 1 individual held the view that there should be greater urgency in the move to LESSE adoption. Further detail from responses is summarised below.

- An environment focused organisation stated that all the measures were appropriate and must be introduced with an appropriate sense of urgency, based on best available science and practical research, with new technologies introduced as they become available.

- An environment focused organisation responded that the roll out of LESSE equipment is relatively easy if appropriately funded and should be seen as a “quick win”. Retention of nitrogen in slurry can be supplemented by reductions earlier in the management chain adding value as a fertiliser. Mixed species swards should be prioritised over grassland monocultures, these swards require lower nitrogen inputs and as such can be effective at reducing emissions if less slurry and fertiliser is required.

- An environment focused organisation explained that a lesson from foot and mouth was that livestock movements within a farm business are difficult to monitor. This approach should be implemented across all farming units dependent on slurry spreading for nutrient input. LESSE needs faster implementation as the preferred method.

- A political party/representative felt that the adoption of LESSE as a standard should be encouraged as fast as possible. Legislation to codify this would be encouraging, and perhaps creating incentives for early adopters would speed up the process. The reduction goal for 2030 is going to be exceptionally difficult without decisive, effective action so quick adoption of solutions like LESSE should be encouraged. The department should consider being more decisive when it comes to preventing the spreading of slurry close to designated sites.

- An individual questioned whether it would be possible to tag farmers/contractor's slurry spreaders to geolocate spreading operations and asked about the use of drones in detecting pollution incidents. They also asked if soil sampling would include being able to ensure land is not too densely applied and designated sites are protected from unscrupulous operations affecting watercourses.

Supportive of the proposal

- SUMMARY - Three organisations (2 Councils,1 environment focused) and 62 individuals were supportive of the proposal that all slurry and digestate which is being exported from the farm/site of production should be spread by LESSE. Further detail from responses is summarised below.

- A Council responded that it welcomes the progression, given its potential for ammonia reduction.

- A Council agree low emission slurry spreading equipment (LESSE) is one of the most effective ammonia reduction techniques. Spreading slurry using LESSE has been an important part of reducing the impact of farming on the environment. The move towards requiring slurry which is being exported between farms to be spread by LESSE will make such conditions as part of planning applications easier to enforce.

- An environment focused organisation strongly supports implementation of trailing shoe/trailing hose and dribble bar spreading technology. The proven increased efficiency in nitrogen recovery from injected /LESSE can permit reductions in applied nitrogen fertiliser usage with concomitant reductions in nutrient leakage and water quality improvement.

- Forty-one individuals responded that all slurry and digestate which is being exported from the farm/site of production should be spread by LESSE.

- Further comments from individuals were that: LESSE is important to reduce emissions; that all these gains are positive; that they do not object to the proposal; and that all their slurry is spread by LESSE.

Qualified support

- SUMMARY - Three organisations (2 environment focused, 1 farming focused) and 5 individuals were supportive of the proposals where the measure is appropriate, taking into consideration individual circumstances. Further detail from responses is summarised below.

- An environment focused organisation highlighted that the measures have a significant role to play in reducing emissions and should also support improvements in productivity through more targeted applications of organic materials to soils, delivering benefits to farm businesses. The move is welcome but must be followed by an effective system of monitoring and enforcement to ensure high rates of compliance.

- An environment focused organisation stated it is essential to ensure the current derogation of the Nitrates Directive is reviewed to avoid sending conflicting signals to land managers and to underpin the commitment to achieving targets set out in the strategy. Consideration should also be given to redirecting extra slurry to farms that could effectively utilise it, informed through the Soil Nutrient Health Scheme. Both the exporting and receiving farm would need an active nutrient management plan.

- A farming focused organisation observed that the timeline is ambitious, and that farmers and industry will require supportive policies to enable the target to be met.

- Four individuals were supportive of the proposed additional LESSE progress point where appropriate with provisos including: where the equipment is available; where the land can support it; the need to address small, hilly and damper lands that could not take the much heavier equipment.

Further suggestions made or matters raised

- SUMMARY – 4 organisations (3 farming focused and 1 environment focused) and 3 individuals made further suggestions in relation to this proposal. Further detail from responses is summarised below.

- A farming focused organisation stated that climate change is driving the agenda and there is no time to waste. They support the move to LESSE in the knowledge that more needs to be done in this area due to contamination problems and dead grass striping in warm weather on certain types of land with LESSE equipment. In addition there may be a place for slurry buggy spreading with splash plate (aerosol is minimal) as a low-cost transition for many farmers and trials should be done on this.

- A farming focused organisation proposed a phased introduction of LESSE on a more realistic time scale. Concerns over the reliability of LESSE equipment should be addressed as a prelude to the encouragement of wider use on farms. The net environmental impact of LESSE equipment should be evaluated since their use involves more water and increased diesel use by tractors. Cost benefit needs to be evaluated in the context of capital cost and running costs. The threshold for LESSE requirement should be lowered to 150 LSUs.

- A farming focused organisation stated that all slurry and digestate which is being exported from the farm/site of production should be spread by LESSE; LESSE is appropriate farms where land is capable and safe to accommodate this machinery. However this approach still presents issues where the equipment is not available to remove or finely chop the fibre that exists within the slurry. The result is that fibre is sitting in long strips on the fields and has not rotted before the grass has been cut for silage. This slurry fibre is being picked up and wrapped within the bales with the result that cattle refuse the silage. This would be less of an issue if processed through an AD plant.

- An environment focused organisation recommended that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy.

- An individual pointed out that exporting slurry leads to higher fossil fuel usage.

- An individual queried how the carbon footprint of these proposals weighs against the perceived ammonia reduction benefits?

- An individual suggested this wouldn't be an issue if the slurry was processed through an AD plant.

Concerns about impact on small farms

- SUMMARY – 6 organisations (4 farming focused, 1 Council and one political party/representative), campaign response A, and 38 individuals were concerned about the impact on small farms. Further detail from responses is summarised below.

- A farming focused organisation voiced concerns that the proposal to force use of LESSE on these farms by 2025 has potential to hinder the movement of manures. If slurry is currently being moved by contractors, it will already be spread with LESSE however the majority of smaller farmers currently importing slurry will not be in a position to purchase or use LESSE. How will DAERA enforce this measure as it is difficult to prove if the slurry being spread has come from a different farm?

- A farming focused organisation opposed mandatory LESSE as on small farms such equipment is not viable and contractors unaffordable.

- A farming focused organisation have concerns that this will hamper smaller farms and farms without livestock from importing a cheaper source of nutrients from more intensive units which could then have unintended consequences. They don't understand how this could be enforced at farm level.

- A farming focused organisation perceived this as a positive, but small farmers will need help in adapting current slurry spreaders/tankers as small beef farmers may struggle with slurry dry matter being too high to go through LESSE. They may need help in separation of slurry and possibly grants.

- A Council was concerned at the impacts on small farmers in terms of affordability of

equipment and sought clarity on specific proposals for grant aid to those farmers and farm contractors who wish to buy the equipment but require financial support. A specific scheme for small holdings is called for to enable them to adapt. They also call for the Department to conduct a scoping exercise across small farms prior to introduction of this requirement. They also noted reports of LESSE machinery having an impact on contamination of silage with associated impacts on animal welfare and ask that the Department further research/investigate this matter.

- A political party/representative has concern that all slurry spreading must be done by LESSE by 2026. This will have largest impact on smaller farmers particularly in Fermanagh and South Tyrone. LESSE is very expensive and very much out of reach of many farmers. The practicality of such a measure will hinder many farmers and make them solely reliant on contractors to spread slurry, which could lead to issues down the line. Financial assistance will be required to see this proposal work.

- Campaign response A and 31 individuals stated that LESSE machinery will play a significant role in reducing ammonia emissions at spreading compared to splash plate through the use of a dribble-bar, trailing shoe or injection. They have specific concerns about the impact on small farms with a lot of small fields where the LESSE equipment may not suit getting through gaps etc. DAERA have not indicated how practical this technology is on smaller/smaller farms. There will be challenges with contractors, what other options has the department considered for small farms to reduce ammonia?

- An individual highlighted that small beef farmers may struggle with the dry matter being too high to allow slurry to be spread through LESSE options and may need help in separation of slurry and possibly grants etc.

- An individual expressed concern that DAERA has not indicated how practical this technology is on smaller farms. There will be challenges with contractors and, in setting a time bound target, there must also be consideration of external dependencies such as supply chain robustness and scaling up vehicle production. What other options has the Department considered for small farms to reduce ammonia?

- An individual responded that it seemed unfair if large farmers were to get grant aided equipment that was available at that time and now small farmers with less resources are told they have to get it when the scheme is now closed.

- An individual with a small pig farm stated that any slurry exported goes to small, local beef and sheep farms. If this is imposed, it is hard to see how these importers could justify the extra costs incurred by adopting LESSE. In such cases importers would turn to increased use of artificial fertilisers which would offset any benefits of LESSE reducing ammonia emissions.

- An individual stated that LESSE slurry application is fine if you are above 200 LUs or a contractor otherwise it is disproportionally expensive. Smaller farmyards and smaller farms cannot accommodate these large machines, nor can they be financially afforded. There needs to be an exception made for small farm businesses, which would not be conducive to contractors' large machinery, nor would these small businesses be attractive to the

contractor who would serve existing large customers with accessible farmyards, and larger accessible fields. This exception could be based around livestock units. and average field size / tank size / farmyard measurements.

Financial concerns

- SUMMARY - 11 individuals had financial concerns related to the additional costs arising as a result of the proposal. Further detail from responses is summarised below.

- An individual responded that if slurry was being exported to an arable farm, they would let the arable farm use splash plates rather than LESSE as the arable farm has only one chance in a whole year to put slurry on and can't afford LESSE equipment for one application of slurry in a year.

- An individual felt that this is not only limiting to the farmer but also adds additional costs. As many farms already pay for or have equipment to spread the slurry themselves, and with the cost of fertilisers continuing to rise smaller farmers need the free and easy exchange of excess slurry to limit output costs.

- An individual questioned how the increase in costs will be compensated, stating that property value could decrease, income will decrease for farmers, and buildings could require refurbishment.

Not supportive of the proposal

- SUMMARY - 3 farming focused organisations and 14 individuals were not supportive of the proposal. Further detail from responses is summarised below.

- A farming focused organisation are opposed to this proposal. A key objective of water policy has been to allow the redistribution of nutrients from farms with excess to those that would benefit from organic manures. This tends to replace some chemical fertiliser and in general will see nutrients in additional organic manures move from more intensive to less intensive farms or to non-livestock farms. The increasing amount of paperwork that is now required for movements of organic manures has resulted in some farmers moving away from importing organic manures due to concerns around inspections. The proposal to force the use of LESSE on these farms by 2025 has the potential to further hinder the movement of manures. If slurry is currently being moved by contractors, it will already be spread with LESSE, however the majority of smaller farmers currently importing slurry will not be in a position to purchase or use LESSE as outlined in question 7. It will be almost impossible for DAERA / NIEA to enforce this measure in 2025 without following slurry tankers and being in a position to prove while spreading is taking place that the slurry spread has come from a different farm business.

- A farming focused organisation are against this because of the uncertainties surrounding the viability and impacts of this proposal given it is timetabled to move so quickly. There is no indication of funding and whether manufacturers can deliver by 1st January 2025.

- A farming organisation responded that the strategy would have the opposite effect to that which is desired. The movement of nutrients between farms is something that should be heavily encouraged by DAERA. The proposal places an additional, unnecessary, barrier on more effective nutrient application by discouraging nutrients to be exported from nutrient heavy farms. It is possible, say that two farmers have historically exported and imported nutrients. There may be good agronomic reasons for this – e.g. Farmer A is more highly stocked than Farmer B. Farmer A needs to export nutrients because his soil nitrogen (N), phosphorus (P) and potassium (K) indices are high. Farmer B, who has less stock, needs nutrients and his soil NPK indices are low. A reliable source is from slurry from Farmer A. Neither are large enough to require LESSE equipment, and neither has the cashflow to afford it. The result of this strategy is that Farmer A cannot export the slurry to Farmer B, and so he spreads it using a splash plate on his own land. He would prefer to have it exported but his financial position and legislation force him to do otherwise. Farmer B would like to import the slurry, as his fields need the nutrients – but his own financial position and legislation prevent him from doing so. The result: Farmer A plasters his ground with slurry using his splash plate which leads to a worsening ammonia situation, worsening eutrophication, and a worse agri-economic situation. Farmer B buys in chemical fertiliser to replace the slurry which leads to a worsening eutrophication situation and a worse agri-economic situation. This is not a good scenario to encourage, and we believe that the strategy here should be reconsidered.

- An individual stated this will be impossible to police as imported slurry can be mixed with home produced slurry in a tank before spreading.

- An individual stated that low emission slurry spreading is problematic especially if slurry is untreated; injected slurry means that toxins are being injected into the soil, which has an adverse effect on soil biology. They support slurry being applied by dribble bar, but not injected and comment that slurry is also full of wormers which are clearly not beneficial to soil biology and earthworms.

- An individual stated that the measure disregards the practicalities on the ground of being able to spread using LESSE in certain terrains and disregards the distance that some slurry is being exported. Significant financial aid would be required.

No comment

- Four organisations (2 farming focused, 1 environment focused,1 water focused) and 15 individuals had no comment to make on this question.

Question 7 - What are your views on the proposal to require all slurry to be spread by LESSE by 2026?

- In total there were 330 responses to this question, of which 26 were from organisations, 160 were from individuals, and 144 were from campaign response A.

- Answers were assigned to ten separate categories following consideration. The number of responses in each category is set out in Table 7 followed by summaries of the responses.

Table 7. Number of responses to question 7 by category

Category	Number of organisations	Number of individuals	Campaign response A
Need for greater urgency	4		
Supportive of the proposal	3	6	
Concerns about safe use of equipment and slurry residues in silage	1	45	
Concerns about impact on small farmers and silage contamination	1	33	144
Concerns about cost and funding of LESSE	1	12	
Concerns about impact on small farms	1	16	
More information sought or suggestions made	5	4	
Support LESSE use with caveats	4	22	
Opposed to or not supportive of the proposal	3	16	
No comment	3		

Need for greater urgency

- SUMMARY - 4 organisations (3 environment focused and one political party/representative) stated a need for greater urgency or ambition around this target. Further detail from responses is summarised below.

- An environment focused organisation responded that financial support for LESSE was first introduced in 2009, 14 years ago. They suggest the proposed deadline of 2026 should be brought forward with a requirement for all slurry to be spread by LESSE by 2025, citing

implementation and monitoring risks associated with a more fine-grained approach making it best to keep it simple, so it is clear what has to be done, and by when.

- An environment focused organisation stated that, where appropriate, the installation of LESSE equipment (trailing shoe, dribble bar, and injection systems) is relatively easy to roll out, and if appropriately funded under this strategy should be considered a “quick win” to achieve reduction targets. They question the lack of urgency or ambition around this target and urge the requirement for all slurry, where appropriate, to be spread by LESSE within 1 year of the proposed introduction of a final strategy (by June 2024).

- An environment focused organisation stated that the proposal is appropriate but must be introduced with an appropriate sense of urgency, based on the best available science and practical research, and new technologies introduced as they become available.

- A political party/representative responded that the goals for 2025 (exported slurry between farms required to be spread by LESSE) and 2026 (all slurry to be spread by LESSE) are a great development. Delay in developing this strategy has delayed such policy for too long, the adoption of LESSE as a standard should be encouraged as quickly as possible. The reduction goal for 2030 is going to be exceptionally difficult without decisive, effective action so quick adoption of solutions like LESSE should be encouraged. LESSE’s benefits of better grass growth supported, but the department should consider being more decisive in preventing the spreading of slurry close to designated sites.

Supportive of the proposal

- SUMMARY – 3 organisations (1 farming focused and 2 Councils) and 6 individuals agreed with the proposal. Further detail from responses is summarised below.

- A farming focused organisation agreed with the proposal to require all slurry to be spread by 2026.

- A Council stated that, given its potential for ammonia reduction, they welcome the proposed requirement.

- A Council responded that, given the potential for ammonia reduction and the associated benefits in terms of nutrient management, they agree that all slurry spreading should be required to take place by low emission techniques by 2026.

- Six individuals either agreed with the proposal, said that it was essential, or had no issues with it.

Concerns about safe use of equipment and slurry residues in silage

- SUMMARY - 1 farming focused organisation and 45 individuals cited concerns regarding safe use of equipment and slurry residues in silage. Further detail from responses is summarised below.

- A farming focused organisation and 29 individuals stated that LESSE is appropriate for those farms where the land is capable and is safe to accommodate this machinery. However this approach still presents issues where equipment is not available to remove or finely chop the fibre that exists within the slurry. The result is that fibre is sitting in long strips on the fields and has not rotted before the grass has been cut for silage. This slurry fibre is being picked up and wrapped within the bales with the result that cattle refuse the silage.

- Nine individuals stated concerns about slurry residues leading to cattle refusing to consume the silage.

- Six individuals stated concerns about slurry residue ending up in silage.

- An individual responded that they believe this is a dangerous proposal. They believe they are seeing the detrimental effects on cattle health on farms that have adopted LESSE in full namely increased risk of silage spoilage. This occurs when slurry is applied by LESSE after 1st or 2nd cut and is followed by a prolonged dry spell with little or no rain to wash away/disperse the slurry dry matter left in lines down the field. As the next crop of grass grows, the decaying slurry dry matter is raised off the ground and held on the leaf of the grass. When the next crop is cut and raked up into the swathe, this slurry residue is ensiled. When the clamp is opened for deeding out, it is thought that these decaying patches within the clamp create a focus for secondary fermentation and an increased risk of mycotoxin challenge. These factors can lead to severe health implications on farm and avoidable welfare issues to cattle. These fears are shared amongst the cattle nutrition industry also. They strongly oppose the mandatory introduction of LESSE on farms in Northern Ireland.

Concerns about impact on small farmers and silage contamination

- Campaign response A, a Council, and 33 individuals are concerned for small farmers who may not be able to afford to buy such equipment and asked what the specific proposals are to deliver grant aid to those farmers and farm contractors who want this equipment but require financial support to purchase the machines? Farmers and farm contractors must be supported with the cost otherwise this could have an impact on farm profitability. They recommend a specific scheme for small and smaller farmers is given consideration particularly in the context of over 80% of farms in the north designated as small/smaller and evidence shows that farmers can make a massive impact by changing their slurry spreading machinery. They recommend the department conducts a scoping exercise prior to this proposal being made mandatory. It has also been reported that LESSE machinery could have an impact on the contamination of silage with an impact on animal welfare and they ask the department to investigate and research this matter.

Concerns about cost and funding of LESSE

- SUMMARY - A farming focused organisation and 12 individuals cited concerns about the costs of this measure. Further detail from responses is summarised below.

- A farming focused organisation suggested that the situation be reviewed by 2025 to assess affordability across all livestock farms and other spreading methods.

- An individual responded that they spread their own slurry but will stop if the proposed new legislation comes into place, as they can't afford the equipment, meaning loss of a significant amount of control of how they operate their farm business. Fibre gets clogged in the pipes meaning contractors are reluctant to work with such slurry and is slow to rot into the soil.

- An individual responded that it is not feasible due to the expense and the cost of LESSE will increase more if all farmers have to use it by 2026. Existing slurry tankers that are in good working order will be worth nothing and end up as scrap. Larger tractors will be required with higher demand for fuel and emissions will be increased.

- An individual responded that 2026 is too soon and not practical. They agree all slurry should be spread by LESSE, but the grant process for helping farmers purchase LESSE equipment is not adequate. For example the FBIS grant uses reference prices which are out of touch with prices for LESSE on the ground. In order to be successful farmers must apply for less than the 40% grant funding. There needs to be an adequate grant system in place to help farmers move to LESSE and a higher grant rate of the actual costs. The scheme which supports LESSE slow at processing applications which further frustrates farmers.

Concerns about impact on small farms

- SUMMARY - 1 farmer focused organisation and 16 individuals had concerns about the impact of the proposal on small farms. Further detail from responses is summarised below.

- A farming focused organisation stated that on small farms such equipment is not viable, and contractors are unaffordable.

- An individual believes this should be the long-term objective, but the strategy needs to consider carefully the impact on the small farm unit. As a small farmer they are using alternative means to reduce their ammonia emissions: using biological products to reduce ammonia on slurry spreading; improving soil structure and reduction of runoff; using clover swards for nitrogen fixing thus reducing chemical N and ammonia emissions; introducing rotational crop growth to reduce feed imports; extended grazing techniques. They are concerned the blanket approach will have a significant negative impact on small farm units in NI many of which are more environmentally friendly than the intensive units and believe the deadline should be extended for small units <100 LU to beyond 2028, preferably 2030. They also stated that with the introduction of LESSE technology the volume of product being applied in many cases has increased considerably and is increasing risk of runoff to the environment. As the product is applied in small rows it is not as evident as via the use of a splash plate. Whilst the technology has ammonia benefits, abuse of the technology equally has a very negative impact, and the department needs to consider carefully how this can be managed.

- An individual stated that beef farmers with suckler cows and beef cattle on Disadvantaged Areas (DA) and Severely Disadvantaged Areas (SDA) land have small parcels of land in different locations. They have divided their land into small fields by planting hedgerows for shelter and grassland management, and biodiversity. The land is not suited to the large heavy slurry plant used by contractors. They have a small light vacuum tanker used to apply slurry to fields as and when required during silage cutting and grazing rotations. They can utilise the small tractor they need for feeding cattle and general farm work to apply slurry. They stated that it is nigh on impossible for this type of farmer to get contractors to put out their slurry. It is not financially viable for them to come and spread a 4-acre field in one visit. It is not good nutrient management for the farmer to spread all their slurry at once. With the margins in beef farming they cannot afford to pay a contractor to spread their slurry and cannot afford big expensive LESSE equipment. There needs to be financial support for small lightweight dribble bars that can be fitted to smaller tankers, so they can adopt LESSE. This funding needs to be provided in a straightforward simple and direct manner. They are an experienced well-educated farmer but cannot afford to spend time off-farm at Greenmount attaining a qualification to improve their eligibility for funding. They are 52 and their son will be coming into the farm business as their successor, but it is not financially viable to bring him in now, to improve eligibility, whilst they still have to maintain their household, their parents' household, and support their children through education.

More information sought or suggestions made

- SUMMARY - 5 organisations (2 environment focused, 2 farming focused, 1 water focused) and 4 individuals sought more information or made further suggestions in relation to the proposal. Further detail from responses is summarised below.

- An environment focused organisation supported the use of LESSE for slurry spreading but noted that the cost of LESSE implementation will cause difficulties for small dry-stock farms, particularly in marginal/hilly areas and on land with over 15% slope. These farms make a significant contribution to the grass-based suckler beef industry and are the backbone of the rural community across most of Northern Ireland. Hence to take this forward it will largely be a contractor operation. If most farmers are going to be tied into contractors for their slurry spreading, this will remove the opportunity to follow good agricultural practice regarding slurry application and use (as in DAERA's Code of Good Agricultural Practice for the Reduction of Ammonia Emissions -p16).
  They encourage support for technology developments in the area of modifications for smaller tankers and slurry separation. For example there is currently a retrofit package available (c10k) to suit a 1350 gallon tanker. Whilst most smaller tankers have a 1150 gallon capacity, this is not a major increase in size. It should be noted that in the ROI, adaptation is currently grant funded at 60%. They also stated that current research (from Germany) shows that there is only a marginal advantage (6% Nitrogen losses after application) in using a trailing shoe (TS) over a dribble bar (DB) LESSE method. However when other factors are taken into consideration: the Trailing Shoe is 300kg heavier than the Dribble Bar; the Trailing Shoe has a 20HP greater tractor requirement than the Dribble Bar; the Trailing Shoe is less easy to fit, and the additional weight is unbalanced on smaller tankers and tractors; at current prices the Trailing Show costs approx. £7400 more to fit than the Dribble Bar.

The Department should not base their support position on such a marginal advantage in performance and should prioritise their support recognising the particular need to retain a viable, environmentally, and economically sustainable beef and sheep industry, largely dependent on smaller farms. The suitability of the Dribble Bar system may facilitate its uptake on many more farms than the Trailing Shoe system and help address the problem of dependence on contactors and promote concomitant adherence to Good Agricultural Practice as outlined above. They also recommend that the Department consider measures such as supporting machinery rings and co-operative practices with shared equipment for smaller farms. In such a situation, the cost advantage of the DB over the TS might lead to more LESSE machines being available for use and thus achieving greater value for money invested. To avoid the measured spikes in slurry application around the opening/closing date mechanism currently in place, we recommend a more flexible system of approval for application based on weather condition and soil type be implemented. This would also enable more nutrients to be recovered and more climate resilience to be built into the system.

- An environment focused organisation recommended that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy.

- A farming focused organisation proposed that, rather than a complete ban on use of splash plate system a phased threshold reduction based on livestock numbers should be introduced over a set time frame.

- A farming focused organisation stated that a blanket ban on LESSE by 2026 would be very challenging for NI farming due to the time pressures and existing debt structure on farms. This would also need significant funding and a cost benefit analysis for DAERA would likely have limited benefits for providing grant funding for very small herds, and that money could be better spent elsewhere. They wonder whether a more appropriate model would be to limit the sale of new splash plates by a certain date. and slowly phase down the number of livestock units a holding can have if they are to be able to use splash plate technology.

- A water focused organisation welcome the use of LESSE slurry spreading by 2026 in principle if it is likely to improve water quality. They stated that intensification of the livestock sector and the all-year round housing of cattle is causing a massive slurry build-up on farms and must be discouraged. There is a need to be careful that the use of LESSE applicator techniques does not encourage more large farms and intensification. Many small farm businesses may not be able to afford the investment in such equipment, thus forcing them to cease farming and be taken over by their large neighbour who can afford the LESSE machinery. So, the small farmers could go out of business and the large farms get larger, overall causing a greater slurry problem. It must always be remembered that livestock numbers are the root of the ammonia and slurry problem, so incentives should be implemented that reduce livestock numbers, particularly in areas where land conditions are poorer. At present large farm units already are required to use LESSE spreading equipment. This primarily relates to dairy cow slurry which is typically c4% Dry solids (ie very soft and will flow easily in the technology). For beef systems raw slurry is up to 10% DS which will not flow freely and if spread at this % will remain in rows in the field and will be recaptured with the grass rake back into the silage contaminating future feed. In order

to eliminate this problem the slurry will need to be diluted with Water. The strategy should consider the source of this water as I understand it is illegal to remove water from rivers/lakes etc without consent. If the farmer reverts to using potable water, they will be charged which is fine, but the larger issue is that this would create additional demand on our resources and costs. The strategy is silent upon the estimated volume of water that will be required and how this will be sourced to achieve this outcome.

- An individual asked what will happen to all the slurry tankers with only a spread plate.

- An individual believes there should be options available to sell your slurry to AD plants or have an arrangement to have it processed at AD plants, reducing silage wastage and the fibres that are not broken down on fields with LESSE.

- An individual stated that one major issue that could be overlooked in these systems is the impact compaction can have within soil structures.

- An individual stated that there would be less of an issue if processed through an AD plant.

Support LESSE use with caveats

- SUMMARY - 4 organisations (2 environment focused and 2 farming focused) and 22 individuals responded to this question. Further detail from responses is summarised below.

- An environment focused organisation stated that this is an important intervention in reducing emissions. Farmers should be supported in the years leading up to 2026 with clear information and advice on the benefits of more targeted application, while also being provided with adequate resources to invest in appropriate capital.

- An environment focused organisation stated that they support this, recognising the impact it would have. However consideration should be given to a phased approach, with larger farms being required to transition sooner. Consideration needs to be given to how the smaller, more extensive, farms which are contributing less to the problem, can be supported to make this transition as current LESSE options are not necessarily suited to small scale operations and upgrading of equipment may not be economically viable on an individual farm basis. They would like to see support for technology developments in the area of small tankers and slurry separation and for supporting the sharing of machinery between farmers to reduce costs and encourage uptake. It is important to stress that LESSE and other technologies alone will not be enough to meet the medium and long-term ammonia reduction targets. It is essential to tackle how the ammonia is being produced in the first place, rather than focusing mainly on making the ammonia produced less polluting.

- A farming focused organisation supports the use of LESSE for slurry spreading wherever it is deemed to be practical in its application and its use does not create other issues due to removing the control away from individual farmers and into the hands of contractors. The cost of LESSE equipment will rule it out for smaller (particularly suckler/drystock) farms,

- A farming focused organisation had the observation that this timeline is ambitious and that the farmers and the trade will require supportive policies to enable this target to be met.

- An individual stated that they have already adopted this method so have no issues regarding it but are aware that it will cause much hardship for many others who will have to rely on contractors to spread as LESSE equipment is expensive and small tankers aren't really compatible with this kind of technology.

- 18 individuals were supportive of the use of LESSE where the land is appropriate, and it can be safely accommodated.

Opposed to or not supportive of the proposal

- SUMMARY - Three farming focused organisations and 16 individuals are opposed to the proposal. Further detail from responses is summarised below.

- Two farming focused organisations are opposed to the mandatory use of LESSE for all farms. The timeline proposed is not feasible, there would be a significant cost to farms should this be imposed in NI and it is totally unacceptable. Farmers have been moving towards LESSE over the last number of years and it is positive that a survey of slurry spreading practices in NI by AFBI in 2020 reported that an estimated 39% of slurry was spread by LESSE, improving nutrient efficiencies. These changes have been driven by the various funding schemes that have assisted farmers in purchasing LESSE. The majority of farms in Northern Ireland own their own slurry tanker, which offers them flexibility to spread slurry when conditions are most suitable, minimising environmental risk and maximising nutrient efficiency.
  While there has been an increase in the number of dribble bar or trailing shoe tankers on farms, these are costly, and the majority of farmers are not in a position to purchase new LESSE. In addition, many farms would not have a tractor large enough to operate LESSE. Even if the current level FBIS support for low emission spreading was rolled out again it will be still unviable for most smaller farm businesses in Northern Ireland. Many small dairy and beef farms run a profitable business as they can carry out their own slurry spreading using their own equipment at the most suitable times. Imposing additional costs plus the likelihood that contractors are unlikely to prioritise smaller farms could threaten the viability and future of these smaller businesses. There will also be a reduction in nutrient efficiency as the ability to choose the most suitable times for spreading will be removed. Despite the benefits of LESSE, there also many practical concerns with the usage of LESSE.
  This equipment is more expensive to purchase and to use than splashplate tankers. The reliability of LESSE is questionable and is dependent on slurry composition and quality. At times famers and contractors report that it has been difficult to obtain replacement parts resulting in long periods of downtime for LESSE again reducing the reliability of this equipment. It should also be highlighted that splashplates will remain the most economically method of spreading dirty water therefore it is not practical or realistic to completely ban the use of the splashplate tanker. Splashplates will be necessary on most farms for some spreading at certain times of the year and for emptying the last few loads of a tank which is thicker in consistency etc.

Farmers have found that spreading with LESSE in dry and warmer months of the year results in the slurry staying in the lines in which it was spread and contaminating silage crops. This is an animal health and welfare concern and a reason why many farmers do not use LESSE between silage cuts. Vets are reporting an increase in mycotoxins in some larger dairy herds with many attributing this to the use of LESSE. This is further exacerbated when farmers are relying on contractors as farmers are dependent on the contractor's schedule rather than spreading at the most appropriate times. CAFRE have highlighted silage contamination in an article published online stating 'with high applications followed by dry weather, the fibre from the applied slurry can lift up into the crop'. Others advise farmers to consider tedder/rake ground clearance following application and/or using products such as a mycotoxin binder to reduce health impacts. Both of these options will add additional cost which is unlikely to have been considered in economic assessments of LESSE carried out to date. This is a major concern and further investigations into the animal health implications of LESSE equipment must be examined. Farmers believe that DAERA have been dismissive of this issue to date and urge the Department to liaise with Private Veterinarians on this aspect.

The LESSE are heavier machines and soil compaction is a real concern and, while umbilical systems are preferable these may not be practical to use in some locations. Even the operation of umbilical systems with heavier tractors can cause compaction issues. A contractor is unlikely to set up an umbilical system to spread on a small area of land again impacting on the smaller farmers. Larger tractors are required to haul LESSE and therefore a move away from splashplates not only requires the replacement of a tanker but also a tractor. There are locations which are unsuitable for LESSE. Many fields in NI will be unsuitable for LESSE as they are small in size or due to the slope. Access to yards could restrict the ability to use LESSE on some farms, and narrow laneways to fields may be unsuitable for the larger tankers and distance could make them unsuitable for umbilical systems. Farms split by roads again may be unable to use umbilical equipment. This has been recognised within the Nutrients Action Programme with a relevant exemption included within the Regulations.

Farmers have also highlighted the difficulty in getting contractors to do slurry spreading work at peak times e.g. silage time and therefore in order to get nutrients applied at the most appropriate time it is necessary to do this work yourself however a LESSE could not be justified. It is too simplistic to suggest the contractors would increase capacity to cope with the potential increased demand as contractors are already facing labour shortages. The seasonal nature of the work with anti-social hours often makes it difficult to attract employees. Spreading would be dictated by the contractor's schedule as opposed to the optimum time for nutrients and the decisions around spreading would be taken out of the farmer's hands. Researchers in Wageningen University have indicated that splashplates used alongside low protein diets and maximum grazing can deliver equivalent emissions reductions to injection tankers and high protein and limited grazing systems. This would further support a more proportionate response to the use of LESSE on some farms which are more likely to have lower protein diets and grazing animals.

In addition to the many practical and financial concerns listed above it should be noted that it is highly unlikely that the manufacturing sector could supply the number of tankers required should this measure be imposed along the current timelines. There are still considerable delays to those farmers who sought to purchase LESSE within the Farm Business Improvement Scheme (FBIS) Tier 1 scheme despite manufactures being aware of the scheme opening in advance. It is totally unrealistic to expect that every farmer in NI would be able to source LESSE by 2026. There are also concerns that in future DAERA

may again move the ‘goalposts’ and declare the dribble bar unacceptable. Farmers switching to replace splashplate tankers with dribble bar will make a significant financial investment and need guarantees that this type of LESSE will satisfy DAERA in future. Any moves to drive farmers towards LESSE must be accompanied by a suitable support package. Regardless of support, moves towards LESSE will not be suitable or a proportionate policy option for the spreading of all slurry and for many smaller farmers and therefore must be rejected.

- A farming focused organisation representative stated that 2026 is much too soon to be viable and financially achievable.

- An individual is totally opposed to mandatory or compulsory use of LESSE due to financial costs, compaction, topography, field size and farm sizes, stating that 79% are very small farms.

- An individual stated that the proposals were not practical or possible due to the type of land and size and type of equipment.

- An individual stated that the expense of the new tankers and/or a retro fit kit is totally inaccessible to the average farmer.

- An individual doesn’t think this proposal necessary as current restrictions are enough.

No comment

- Three organisations (1 farming focused, 1 environment focused, 1 Council) had no comment to make on the proposals or stated that it was not relevant to their sector.

Question 8 - Do you have any comments on the proposals to encourage implementation of longer grazing seasons?

- In total there were 334 responses to this question, of which 26 were from organisations, 164 were from individuals, and 144 were from campaign response A.

- Answers were assigned to six separate categories following consideration. The number of responses in each category is set out in Table 8 followed by summaries of the responses.

Table 8. Number of responses to question 8 by category

Category	Number of organisations	Number of individuals	Campaign response A
Need for greater urgency	1		
Supportive of the proposals	3	6	
Grazing season determined by weather and ground conditions	7	136	144
Further suggestions made	14	9	
Not supportive of the proposals	6		
No comment		8	

Need for greater urgency

- One environment focused organisation stated that the proposals are appropriate but must be introduced with an appropriate sense of urgency, based on the best available science and practical research, and new technologies introduced as they become available.

Supportive of the proposals

- SUMMARY - 3 organisations (2 farming focused and 1 environmental focused) and 6 individuals were supportive of the proposal. Further detail from responses is summarised below.

- A farming focused organisation stated that they support measures to encourage and assist farmers in extending grazing seasons.

- A farming focused organisation note the analysis presented in the Strategy highlighting the lower ammonia emissions associated with grazing livestock and the application of fertilisers to grassland and agree that the storage and management of animal slurries should be the major focus of the Strategy. They also note that longer grazing will contribute to reducing ammonia emissions and support measures to encourage and assist farmers in extending grazing seasons.

- An environment focused organisation had the view that this seems like a reasonable approach, especially as such grazing methods may reduce the associated carbon cost of supplementary feeding, especially imported feed such as soya.

- An individual stated that they would support this proposal if it helps to reduce emissions.

- An individual is favour of the proposals as this will increase our 'green' image and will be more favourable with consumers, and less intensive agriculture will promote wildlife habitats.

- An individual stated that grass is the cheapest form of animal feed, so they would be content with this.

Grazing season determined by weather and ground conditions

- SUMMARY - 7 organisations (four farming focused, 1 political party/organisation, 2 Councils), campaign response A, and 136 individuals stated that the length of grazing season is determined by weather and ground conditions. Further detail from responses is summarised below.

- A farmer focused organisation recognises that an extended grazing period will reduce ammonia emissions. However, weather will have a major impact to the potential to extend the grazing season in NI, and while a 5-year average is being determined, the weather in NI is unpredictable. Grazing can also be difficult for some dairy farms due to the location of their land and unless a farm has access to grazing ground surrounding their housing this can be impractical due to roads etc.

- A farming focused organisation and 16 individuals responded that if the land area permits and weather conditions are favourable this should be agreed. However from a practical perspective it must be reviewed annually to determine if an extended grazing season has been achieved for that year. Farmers will always hope to achieve an extended grazing season as this is the cheapest means of animal feeding.

- A farming focused organisation stated that most farmers already work to this principle All farmers grazing animals will work to maximize grazing on farm but weather, location, and soil type dictate length of grazing season.

- Campaign response A and 29 individuals stated that that most farmers keep their livestock in fields for longer, but it is weather dependant. Extending grazing reduces the requirement for housing. Farmers in LFAs would find this policy difficult to implement given the ground conditions.

- A political party/representative stated that DAERA wants to encourage longer grazing seasons. In reality this sounds good, and in many respects, most farmers already work to this goal. Nevertheless, the potential reduction in ammonia is minimal and as with most seasons of grazing, everything is weather permitting. In Fermanagh especially this may not be feasible due to ground conditions.

- A Council have concerns regarding whether this measure is achievable given the variability of weather in Northern Ireland. Extending grazing reduces the requirement for housing. Farmers in LFAs would find this policy difficult to implement given the ground conditions.

- A Council acknowledge that achieving grazing seasons that are on average one week longer at the beginning and end of each season will reduce total cattle ammonia emissions by 3.5%, however, given the variability of weather in Northern Ireland, this may not be achievable.

Further suggestions made

- SUMMARY – 14 organisations (6 environment focused, 5 farming focused, 1 political party/representative, 1 Council, 1 water focused) and 9 individuals made further suggestions in relation to this proposal. Further detail from responses is summarised below.

- An environment focused organisation strongly supports this measure. While recognising the ease of management for stock movement and milking and the simplicity of straight fertiliser -based grassland production from zero grazing i.e. permanently housing animals, we are opposed in principle to this practice and therefore support the implementation of longer grazing seasons. As 61% of ammonia emissions come from the management and spreading of slurry and 6% from grazing livestock, the longer animals are able to be kept outdoors the better. A relatively small area of silvopasture on farms saved for late autumn or early spring grazing could significantly extend the period animals can remain grazing. We would encourage the Department (particularly CAFRE) to include a better understanding of soil management into its educational and training courses.

- An environment focused organisation welcomed the recognition that trees can play a role in facilitating longer grazing seasons. However, the Draft Ammonia Strategy only focusses on agroforestry (silvopasture). Hedgerows can deliver a range of benefits that can extend grazing seasons as well as capturing and storing carbon and benefitting wildlife. These benefits support a number of workstreams under Future Agricultural Policy including the Farming with Nature and Farming for Carbon Packages. They recommend the strategy encourages and supports farmers to plant and restore hedgerows to encourage longer grazing seasons and that this is included in successor schemes to the Rural Development Programme.

- An environment focused organisation stated that a shift to agroecological farming practices can play a key role in supporting a longer grazing season, with a holistic focus on soil health, covering chemical, physical and biological function. Interventions aimed at building all three foundations of soil health should be encouraged and incentivised, not just within the ammonia strategy but within the wider agricultural policy framework, including mob/deferred grazing, herbal leys and integrating trees effectively into productive farming systems. DAERA should seek to emphasise the benefits of a longer grazing season, not solely from the perspective of emissions reduction, but also through reduced costs from shorter housing periods, less reliance on artificial inputs to maintain production and higher carrying capacities as a result of improved pasture and soil health.

- An environment focused organisation stated that this strategy should work alongside future agricultural policy to encourage uptake of more nature friendly changes to agricultural management through future payment frameworks such as the environmental farming schemes, potentially developing remedial management plans by implementing new grazing regimes in future agreements on certain areas of land where it is possible to administer longer grazing seasons. However, balance must be struck between maintaining sensitive sites' delicate grazing regimes and moving to more extensive systems with higher stocking rates.

- A farming focused organisation stated that farmers will need more training on paddock grazing and that full grants are needed for infrastructure in fields to allow paddock grazing. They also suggested looking at soil humus and biologically enhancing soil products to make ground more passible in the shoulders of the year.

- A farming focused organisation agree that a longer grazing season is beneficial, but it is difficult to set targets for this. They agree with the need for support for associated capital investment, most notably around development of grazing infrastructure.

- A farming focused organisation stated that they support this measure in principle. However, it should be noted that all farmers currently grazing animals will work to maximize grazing on farm therefore unlikely that this measure will deliver the expected reductions. Farmers strive to achieve longest grazing period as possible. DAERA should note that if supporting grazing infrastructure, they should consider support for drainage in appropriate areas. For some farms within the Environmental Farming Scheme, grazing at certain times of the year is restricted and therefore farmers are forced to house livestock if no alternative winter grazing sites can be found. In terms of verification of grazing, there is currently a proposal for the inclusion of an All-Island Grass Fed Beef PGI between DAERA and DAFM. As part of that specification, cattle must spend a minimum number of days grazing pasture with a tolerance due to mitigating circumstances, defined as weather, soil type, animal welfare considerations or other environmental conditions are impeding factors. It is the industry's intention for the Northern Ireland Beef & Lamb Scheme (NIBL FQAS) to collect data from farmers on their turn out dates and turn in dates. Farmers will be audited at a minimum once every 18 months by a trained independent auditor. This information may be useful in the future in order to assess grazing within the beef sector provided that data sharing agreements allow. This could give confidence to officials and planners when assessing ammonia emissions and merits further discussion.

- An individual asked if the farmer who keeps cattle out on grass as long as possible and tries his best will be treated the same as someone who keeps them indoors 365 days.

- An individual stated that as a grass-based farmer, they do all they can already to lengthen the grazing season and quite often have cattle out well into December, and there shouldn't be a blanket approach to all farmers. Bigger dairy farms and fully housed systems create most ammonia and have seen a lot of financial gain from this approach. The farmers who have created the ammonia problem are the farmers to help fix it.

- An individual stated that optimising grassland management is the key. Climate change will most likely result in milder and wetter weather with little difference in temperatures throughout the year.

Not supportive of the proposals

- SUMMARY - 6 individuals were not supportive of the proposal. Further detail from responses is summarised below.

- An individual stated that longer grazing seasons cause soil erosion, and they don't think it is a good idea with the level of rainfall.

- An individual stated that better housing, bigger tanks, and having more stock inside may be better for the environment.

- An individual stated that if they could have done this they would already have done so. Their beef farm is used for winter grazing by local sheep farmers.

No comment

- Eight individuals had no comment to make on this proposal.

Question 9 - Do you have any comments on how to reduce ammonia emissions from chemical fertiliser, including the potential introduction of a prohibition on the use of unprotected urea fertiliser?

- In total there were 320 responses to this question, of which 26 were from organisations, 150 were from individuals, and 144 were from campaign response A.

- Answers were assigned to eight separate categories following consideration. The number of responses in each category is set out in Table 9 followed by summaries of the responses.

Table 9. Number of responses to question 9 by category

Category	Number of organisations	Number of individuals	Campaign response A
Need for urgency	1		
Supportive of prohibition	6	63	
Support use of inhibitor, not supportive of a ban on unprotected urea	4	31	144
Concerns about costs and benefits	3	4	
Concerns about shelf life		5	
More information needed/other proposals	6	24	
Not supportive of prohibition	3	13	
No comment	3	10	

Need for urgency

- An environment focused organisation stated that measures must be introduced with an appropriate sense of urgency, based on the best available science and practical research, and new technologies introduced as they become available.

Supportive of prohibition

- SUMMARY - 6 organisations (3 farming focused, 2 Councils and 1 political representative) and 63 individuals were supportive of prohibiting the use of unprotected urea fertiliser. Further detail from responses is summarised below.

- A farming focused organisation stated that there is a lot less waste with liquid fertiliser application and if farmers were properly paid for their produce progress would be a lot easier on all fronts.

- A farming focused organisation stated that the sale of unprotected urea should be banned, and they agree with the proposal to introduce legislation to prohibit the use of unprotected urea fertiliser. However the principal negative is that the shelf life for the inhibitor has a life expectancy of 4 to 6 months and fertilizer manufacture is not a' just in time' production and delivery system.

- A farming focused organisation agree with the proposal to switch to the use of protected urea. Farmers should be incentivised to use protected urea. The supply chain for protected urea should be investigated since the inhibitor used has limited shelf life.

- A Council welcomes that legislation is being considered to achieve these particular outcomes.

- A Council agree that the best way reduce ammonia emissions from fertiliser is to introduce legislation which would ensure the prohibition of the use of unprotected urea fertiliser.

- A political representative stated that it is very encouraging to see proposed legislation for this, noting that while urea fertiliser is of relatively low usage, decisive action is welcome. Protected/stabilised urea fertiliser should be the minimum standard for its usage and the department is right to pursue this.

- Thirty individuals agreed that the sale of unprotected urea should be banned. Of these 26 supported the introduction of legislation to ban sales of unprotected urea and 16 also noted that the shelf life for the inhibitor has a life expectancy of 4 to 6 months and fertilizer manufacture is not a' just in time' production and delivery system.

Support use of inhibitor, not supportive of a ban on unprotected urea

- SUMMARY - 4 organisations (1 environment focused, 1 farming focused, 1 political party/representative, 1 Council), campaign response A, and 31 individuals supported greater use of an inhibitor but did not support an all-out ban. Further detail from responses is summarised below.

- An environment focused organisation supports all moves leading to a reduction in the use of chemical fertiliser and a greater awareness of, and encouragement for, measures that focus on soil health and biological regeneration of soil fertility. They also recognise the value of urea fertiliser and that the move towards regenerative farming will be slow and not suit all farmers but will eventually be driven by increased costs and, in the case of phosphate, decreased availability of phosphatic fertilisers (it is recognised that mineral phosphatic mining has now passed "peak production") of raw materials in fertiliser production. Hence, while urea use continues, they support use of the protected form of urea.

- A farmer focused organisation accepts that there is local research suggesting that the use of protected urea can reduce ammonia emissions when compared to untreated urea and as such, does support its use, but would not be in favour of a blanket ban on unprotected urea fertiliser. It is difficult to see how this proposal will deliver much impact given that the proportion of urea use in NI is so low and it is out of step with policy in the rest of the UK

which has not proceeded with such a prohibition. Due to the significant expense, farmers will be seeking to minimise nitrogen and ammonia losses as much as possible and as such, urea is typically spread earlier in the growing season when the risk of this is lower.

- A political party/representative, a Council, campaign response A, and 30 individuals do not support a ban on the use of unprotected urea fertiliser however they would support greater use of urease inhibitors.

Concerns about costs and benefits

- SUMMARY - 3 farming focused organisations and 4 individuals cited concerns regarding the potential increase in fertiliser costs. Further detail from responses is summarised below.

- A farming focused organisation stated that urea use in Northern Ireland is low therefore the imposition of this proposal will have very limited benefits in terms of ammonia reduction. However, while usage of urea in Northern Ireland is relatively low, it is important and the cheapest source of chemical nitrogen for many farmers. NI farmers are paying some of the highest fertiliser prices in Europe. They are also concerned with the reduced shelf live that protected urea has, the fertiliser is only effective for 6 months. This will impact farms which purchase their fertiliser ahead of the sowing season.

- A farming focused organisation stated, in addition to the comments from the organisation above, that the ban on AN fertiliser forces farmers towards urea as an alternative which is recognised to have higher ammonia emissions than AN. Access to commodity urea keeps the UK fertiliser market in step with the global nitrogen fertiliser market and therefore by having access to commodity urea from the global market, there is a greater chance that the UK fertiliser prices remain competitive. The requirement to use an inhibitor puts a barrier between the global market and NI agriculture therefore will restrict competition in the marketplace and has the potential to further increase prices. Fertiliser is a significant cost on farms and any increases will increase production costs and reduce competitiveness and place NI farmers at a disadvantage to their GB and Irish counterparts. DEFRA has clearly indicated recently ‘that any legislation or industry scheme that takes away the choice of use of fertiliser type (i.e. untreated solid urea) under current circumstances would present significant operational and economic difficulties for farmers.’ Industry representatives in GB have questioned the impact of inhibited urea on soil health and quality.
  In response DEFRA has concluded ‘The impact of increased use of UIs on soil quality is uncertain due to a lack of evidence. There is some evidence that UI-treated urea, as it retains integrity longer in the soil for plant uptake, can lead to increased concentrations of ureic nitrogen in connected watercourses.’ DEFRA also indicates that they will investigate this in more detail before adopting a regulatory approach. DAERA must consider this point before imposing a policy that could result in further unintended consequences.
  The assumptions behind the emission factor for urea fertiliser does not consider the mitigation efforts put in place by farmers to protect urea such as spreading conditions, timing of spreading etc. The majority of urea is spread in the early part of the year when conditions are most suitable, and losses will be minimal. Farmers management is key and as fertiliser is expensive farmers will ensure that the spread in conditions that minimize N losses from urea applications. There are concerns about the research used to verify ammonia reductions from inhibited urea. Urea is also used in orchards, and it is important to ensure that there is a suitable cost-effective alternative for the horticulture sector if this

ban is to be imposed. Despite proposals to ban urea, England have not adopted a blanket ban due to various concerns raised by stakeholders. All the above points suggest that it would be unwise to consider banning the use of urea fertiliser in NI when there are still so many uncertainties around the costs and benefits of this policy proposal.

- A farming focused organisation support any measure that allows for the reduction or more efficient use of chemical fertiliser if it does not affect the viability of the small family farm. There is a danger that prohibiting products could create artificial market conditions ultimately resulting in farmers paying higher prices for inputs.

- Four individuals had concerns related to costs: that the measure is not financially viable; that it is disproportionate; and that it would increase prices by limiting supply.

Concerns about shelf life

- Five individuals cited concerns about the shelf life of protected urea.

More information needed/other proposals

- SUMMARY - 6 organisations (3 environment focused, 2 farming focused and 1 water focused) and 24 individuals sought more information on the proposal or made other proposals. Further detail from responses is summarised below.

- An environment focused organisation stated that an increased focus on all key elements of soil health will help to reduce chemical fertiliser use on farms in Northern Ireland, thereby helping to reduce ammonia emissions. A move to prohibit unprotected urea fertiliser is likely to play an enabling role in a move towards lower chemical fertiliser use, but it must be supported by up-to-date guidance, advice, and appropriate incentives e.g. schemes that improve soil management to adopt more nature-friendly alternatives.

- An environment focused organisation stated that the significant increase in the cost of fertiliser in the past year has highlighted the need for a much more targeted approach to the application of chemical fertiliser and urged a broader approach to soil health and fertility. They welcome the move to reduce emissions using protected urea as a measure but urge caution and suggest further research in relation to its use, in order to understand their impact on naturally occurring bacteria in the soil, and their long-term effects. Also note that the claimed reduction in emissions through their use will only be realised if applied using best practice guidelines which farmers need to be made aware of through an effective knowledge exchange programme.

- An environment focused organisation recommended that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy.

- A farmer focused organisation stated that AD Plants provide the opportunity for organic fertilizer to be an option for farmers, that can be treated to bind ammonia in and thus avoid

volatilisation. Such an approach ties in well with the Circular economy and would reduce artificial fertiliser usage.

- A water focused organisation support the use of protected urea if it ultimately leads to improved water quality and query if there needs to be research and monitoring carried out to determine how this might impact on water quality.

- An individual responded that removal of commoditised fertiliser urea will have a costly distorting effect on the NI fertiliser market. Correct application of urea releases no more ammonia than CAN, farmers are financially incentivised to minimise losses so correct application is strongly encouraged. On the real market in 2022 protected Urea traded at its equivalent CAN price resulting in a premium over Urea of over £200/t at times. The statements in the draft consultation are in the context of maximum possible loses from urea and completely unreflective of reality. Their suggestion for reducing ammonia emissions from chemical fertiliser was to engage farmers in knowledge transfer and best practice around urea applications. They further detailed research studies on: NBPT emissions reductions; wind tunnels; rainfall and micrometeorological measures.

- An individual suggested that DAERA set up system similar to the apple scab or potato blight warning system to give farmers a weather window that would allow unprotected urea to be sown with minimal emissions.

- Two individuals stated that better utilization of slurry offers potential for all farmers to reduce the amount of chemical fertilizer applied.

Not supportive of prohibition

- SUMMARY - 3 organisations (2 farming focused, 1 environment focused) along with 13 individuals were not supportive of this proposal. Further detail from responses is summarised below.

- A farming focused organisation stated that this prohibition would have a disproportionate effect on the small urea fertiliser market.

- A farming focused organisation noted that the Strategy acknowledges that the total amount of urea used in Northern Ireland is relatively low and that Calcium Ammonium Nitrate is the predominant form of nitrogen fertiliser used by Northern Ireland farmers. Any significant substitution of Calcium Ammonium Nitrate fertilisers with urea fertilisers, either as urease inhibitor-treated or untreated, is likely to increase ammonia emissions from fertiliser applications in Northern Ireland. There are a range of challenges in treating urea fertilisers with inhibitor compounds: the compounds are difficult to handle, are usually applied at importer/distributor level in Northern Ireland and can pose health and safety risks for workers engaged in their application; there are limitations on the capacity to apply these inhibitor compounds to urea fertilisers; the application of urease inhibitor compounds introduces additional chemicals to the soil and plant growth system. Furthermore, urea fertilisers treated with inhibitor compounds can be stored for limited periods if the effectiveness of the urease inhibitor is to be maintained.

- One individual stated that these questions are all aimed at the dairy farmer and that arable farmers are not thought of when urea prohibition is talked about. The arable farmer needs urea for first applications to winter crops as CAN fertilisers won't work at that stage of the crop, arable farmers then use protected for second applications to crops so it would be wrong to prohibit unprotected urea.

- An individual stated that a unilateral ban is not necessary; the sale of unprotected urea in sunlight should be banned as it takes heat and sunlight to breakdown ammonia. It does not need to be protected in cooler weather conditions.

- An individual had grave concerns about a blanket policy to use protected urea, noting trials on the most commonly found inhibitors demonstrated that they were taken up by plants, and impacted upon growth (nitrogen synthesis within the plants). When the inhibitors where subsequently taken up by animals during trials, they had health impacts upon the animals.

No comment

- Three organisations (2 environment focused, 1 farming focused) and 10 individuals had no comments to make on this proposal.

Question 10 - Do you have any comments on the proposals to reduce crude protein levels in livestock diets?

- In total there were 347 responses to this question, of which 28 were from organisations, 175 were from individuals, and 144 were from campaign response A.

- Answers were assigned to nine separate categories following consideration. The number of responses in each category is set out in Table 10 followed by summaries of the responses.

Table 10. Number of responses to question 10 by category

Category	Number of organisations	Number of individuals	Campaign response A
Greater urgency required	1		
Supportive of the proposals	4	8	
Qualified support	10	6	
Support if performance not affected		68	
Uses processor's recommendation	1	52	
Financial support required		27	144
More information needed/other proposals	6	5	
Not supportive		9	
No comment	4	2	

Greater urgency required

- An environment focused organisation stated that measures must be introduced with an appropriate sense of urgency, based on the best available science and practical research, and new technologies introduced as they become available.

Supportive of the proposals

- Summary - 4 organisations (1 farming focused, 1 environment focsued,1 Council and 1 political party/representative) and 8 individuals were supportive of proposals to reduce crude protein in livestock diets. Further detail from responses is summarised below.

- A farming focused organisation were interested in all technologies that reduce the need for crude protein in livestock diets.

- An environment focused organisation stated that it seems to be an approach that is worth further investigation.

- A Council recognise that the level of crude protein consumed by livestock has a significant influence on ammonia emissions and are of the opinion that DAERA should work closely with farmers and the feed industry to identify the best strategies to reduce crude protein in livestock diets. The Council advise that crude protein intake is more difficult to control via a condition of any potential planning approval required.

- A political representative/party stated that reducing crude protein in principle seems good and broadly welcomed, with many within the industry having already moved towards reduction.

- An individual stated that this is already their direction of travel in their formulations in order to improve nitrogen digestibility and reduce carbon dioxide equivalent (CO2e) from feed.

- An individual stated that they have reduced crude protein in their animal diets to great effect and this has reduced the amount of slurry they produce.

Qualified support

- Summary - 10 organisations (5 farming focused, 2 Environment focused, 2 Councils, 1 political party/representative) along with 6 individuals had qualified support for this measure. Further detail from responses is summarised below.

- A farming focused organisation support this measure provided it does not affect animal welfare or the viability of small family farms. They noted the importance of other proposed policies not being antagonistic to this policy, and hope that the role the small family farm model plays in the NI economy and its ability to meet a myriad of environmental outcomes is not lost in developing policies to combat highly intensive sectors of the industry. They felt that this requires financial support to ensure farm businesses remains viable. The feed industry needs to identify the best strategies to reduce crude protein in rations, and silage testing and grass testing also require support to determine the overall protein level in grass-based livestock's diets.

- A farming focused organisation stated that this is already an established direction of travel in dairy cow diets, and they agree with the proposed approach. The issue of permanent grass versus the production of animal protein crops needs to be considered in the context of overall carbon emissions.

- A farming focused organisation support the proposals to reduce crude protein in livestock diets in principle. The pig and poultry sectors have made significant gains already in reducing crude protein which will have reduced ammonia emissions and these sectors should be given credit for this. Crude protein (CP) is more difficult to control in grazing livestock / forage-based diets however it is recognised that there is potential for further reductions in the cattle and sheep sectors. Silage analysis is key and should be supported by DAERA. Protein in livestock diets is expensive therefore most farmers will reduce where possible with the right guidance. It is vital that any reductions do not negatively impact on

animal health and welfare and performance which could undermine any environmental improvements from the reduction in CP. They are supportive of DAERA's commitment within the consultation document 'to work with farmers and the feed industry' to identify the best strategies to reduce crude protein in livestock diets. It is vital that the ammonia inventory is updated to reflect changes in the protein levels of diets. They are supportive of home-grown proteins. While the Pilot Protein Crops Scheme was useful and delivered an increase in the number of farmers growing protein crops, longer term commitments from DAERA are needed on protein crops to allow for rotation planning going forward. It should also be noted that not all farms are suitable for growing protein crops due to land type and climate and therefore this will not be an option for all farms. DAERA should review restrictions within the Nutrients Action Programme derogation criteria which restricts these farmers from growing protein crops. This is not helpful and should be removed from the derogation rules.

- A farming focused organisation support DAERA's commitment within the consultation document 'to work with farmers and the feed industry' to identify the best strategies to reduce crude protein in livestock diets. It is vital that the ammonia inventory is updated to reflect changes in the protein levels of diets. Crude protein (CP) is more difficult to control in grazing livestock / forage-based diets however it is recognised that there is potential for further reductions within the cattle and sheep sectors.

- A farming focused organisation welcomes the recognition of the pivotal role precision nutrition can play in helping to reduce nutrient losses, particularly nitrogen in the form of ammonia. It is reassuring that DAERA have indicated a desire to work with the feed industry and encourage direct engagement on this proposal. They feel it would be more appropriate for the focus to be on improving nitrogen use efficiency (NUE) in livestock as a more successful way of driving lower ammonia emissions rather than a tunnel vision approach to the level of crude protein. It is essential that animal health and performance are not compromised by such a broad-brush approach, particularly without the right professional advice. The reference to the ROI nitrates derogation crude protein requirements is not relevant to NI and they do not support any suggestion that a similar requirement be imposed in NI as the NI dairy industry is structured differently.

- An environment focused organisation stated that this is important, and they would like to see a timeline for its introduction, alongside a clear knowledge exchange programme. Local case studies or local champions could help engage the wider farming sector to use concentrates with less crude protein, demonstrating that it has been shown to not affect productivity and that it can benefit their bottom line. This measure however must not be viewed in insolation without tackling the high carbon input associated with feeding imported concentrates and the need to better utilise grass-based production.

- An environment focused organisation strongly supports this measure through a combination of a reduction in imported feed usage and increased reliance on grass-based production, resulting in a gradual increase in arable cropping to produce protein and carbohydrate crops for local livestock consumption. Climate change predictions are for conditions more favourable to diverse arable production so this measure will lead to more climate resilient and lower gaseous emissions (particularly methane and ammonia) from livestock production. Any emissions will be more than offset by gains in food security and sovereignty

and the overall benefits decreased numbers of livestock will bring. There will be no need for decreases in individual animal output or performance. They encourage the Department to look closely at cross-policy linkages and recommend an all-Ireland approach be taken to some of these wider issues of food security and regionality of climate change impact predictions.

- A Council is cognisant that feeding 'low protein' diets can reduce ammonia production. There must be robust verification to ensure proper implementation of such feeding regimes.

- A Council supports this measure however it will require sustainable financial support for farms to transition. The Council urge DAERA to ensure methodologies for reducing crude protein and establishing protein crops are robust and clearly demonstrate the required ammonia emission reductions, prior to implementation.

- A political party/representative stated that the reduction of crude protein in animal diets creating a marked reduction in ammonia production is an important consideration that should be supported but were concerned see such emphasis placed on growth of protein crops as a solution as 113 operations took part in the 2021-2022 scheme and grew around 641 hectares in that time. They asked if this is a realistic solution in a widespread context.

- Two individuals supported the measure in principle, stating that everything possible should be done to support local production, and consequently DAERA should remove restrictions in the Nutrients Action Programme (NAP).

- An individual supports a pilot protein crop scheme to create a domestically produced source of protein; noting that the success would depend on the economics of protein crops vs other crops.

Support if performance not affected

- SUMMARY - 68 individuals supported this measure as long as there were no negative effects on animal growth rates and performance. Further detail from responses is summarised below.

- Thirty-one individuals supported the measure as long as the performance of their birds was not adversely affected.

- Six individuals supported the measure as long as dairy cow performance and milk yield were not adversely affected.

Uses processor's recommendation

- SUMMARY - 1 farmer focused organisation, and 52 individuals stated that their feed is blended as per processors recommendations with no choice given. Further detail from responses is summarised below.

- The farmer focused organisation stated that their meal is supplied from the mill without their input, and they have to hit food conversion targets regardless of the ideals suggested in protein levels.

- Forty individuals stated that their feeds all come from the millers produced to the processor's recommendations.

Financial support required

- Campaign response A and 2 individuals stated that DAERA must recognise the importance of ensuring a balanced livestock diet that achieves acceptable productivity. This will require financial support to ensure farm business remain sustainable.

- Twenty-five individuals stated that financial support will be required to ensure farm businesses remain sustainable.

More information needed/other proposals

- SUMMARY - 6 organisations (3 environment focused, 3 farmer focused) and 5 individuals sought further information or made further proposals. Further detail from responses is summarised below.

- An environment focused organisation responded that specific recommendations need to be made based on peer reviewed literature, with particular focus on percent protein in diets of animals from which initial emission rates are based. This work needs to be supported by monitoring the effect of diets on emissions at a house level.

- An environment focused organisation stated that the strategy does not currently provide any specific recommendations on how reduced crude protein levels in livestock diets will be achieved, other than an ambition to work with industry and the continued rollout of a protein crop payment and doesn't acknowledge the role that a reduction in the total consumption of feed could play in reducing ammonia emissions, while providing a range of other co-benefits.

- An environment focused organisation recommends that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy.

- A farming focused organisation stated that crude protein is expensive therefore most farmers will reduce where possible with the right guidance. Growing protein crops should be supported but needs longer term commitments from DAERA to allow for rotation planning and it is not suitable for all farms due to land type /climate.

- A farmer focused organisation stated that protein as a feed ingredient is very expensive and thus the poultry and pig industries have for years sought to drive protein usage efficiency as part of their existing business model. Nitrogen efficiency needs to be considered in parallel to low protein solutions. Driving nitrogen use efficiency is key because if the protein level drops to the detriment of performance, ammonia emissions will increase. There are limits to how far protein reductions can be taken, given need to be balanced against the need to remain economically viable. If this action is taken forward, economic support is likely to would be required.

- A farmer focused organisation noted that there is progress with seaweed additives and much work being done across the world on diet to reduce emissions from livestock.

Not supportive

- SUMMARY - 9 individuals were not supportive of this measure. Further detail from responses is summarised below.

- Two individuals said that the measure would make farmers less competitive on the world market.

- One individual said they cannot see the benefit in this at all and it would be better encouraging farmers to use independent rumen nutritionists to formulate balanced diets which increase daily live weight gain.

No comment

- Four organisations (1 water focused, 1 environment focused, 1 farming focused, 1 Council) and two individuals had no comment to make in relation to this question.

Question 11 - What are your views on the proposals relating to improving feed efficiency through genetic improvement?

- In total there were 335 responses to this question, of which 27 were from organisations, 164 were from individuals, and 144 were from campaign response A.

- Answers were assigned to eight separate categories following consideration. The number of responses in each category is set out in Table 11 followed by summaries of the responses.

Table 11. Number of responses to question 11 by category

Category	Number of organisations	Number of individuals	Campaign response A
Need for greater urgency	1		
Supportive of the proposals	5	24	
Qualified support	9	28	144
Poultry producers do not select genetics		79	
Further information/research required	5	11	
Financial support required		4	
More information needed/other proposals	6	5	
Not supportive of the proposals		8	
No comment/firm views	7	10	

Need for greater urgency

- An environment focused organisation stated that measures must be introduced with an appropriate sense of urgency, based on the best available science and practical research, and new technologies introduced as they become available.

Supportive of the proposals

- SUMMARY - 5 organisations (3 farming focused, 1 Council, 1 political representative) and 24 individuals were supportive of proposals to improve feed efficiency through genetics. Further detail from responses is summarised below.

- A farming focused organisation agreed with this stating the need to work with Artificial Insemination (AI) Companies marketing bulls in the Top 1% for both Terminal and Maternal Traits. Little improvement in progeny performance will be seen unless sires in the Top 1%

are used. They suggested help for pedigree breeders to import genetics in the top 1% of the breed for feed efficiency (i.e. embryos) from outside Europe to broaden the gene pool.

- A farming focused organisation are supportive of these proposals and the importance of genetic improvement.

- A Council support research on feed efficiency and genetic improvement.

- A political representative/party stated that improved efficiency is always a welcome development to any farmer, and they support such measures.

- An individual stated that this continues year on year in the poultry industry and has made drastic improvements in poultry industry ammonia emissions.

- An individual stated that all farming businesses should be striving to improve genetics in terms of feed efficiency if they want to be successful.

Qualified support

- SUMMARY - 9 organisations (7 farming focused, 2 environment focused), campaign response A, and 28 individuals were supportive of the proposal while making further comments and proposals. Further detail from responses is summarised below.

- Two farming focused organisations are supportive of the proposed Ruminants Genetics Programme. Improving productivity and feed efficiency are vital as the industry moves forward. The proposed Genetics Programme will allow farmers to select and breed from the most productive and environmentally sustainable animals. This is a long-term project however any gains made must be promptly incorporated into the ammonia inventory.

- A farming focused organisation stated that every dedicated farmer always wants to do things better and if straightforward genetic improvement helps ammonia emissions, then it has mileage, however, they will not support genetically modified genes.

- A farming focused organisation stated improved Feed Conversion Ratio (FCR) through management of genetics and nutrition is part of existing business models, has substantially reduced FCR over the last decade for poultry meat production, and will continue to be an area of focus for the poultry sector. Genetic improvement has also been the focus of the egg laying sector with a similar focus on better utilization of nutrition to drive performance. While different production models will have different FCRs the metric across all will be the ammonia emissions per house per year, with the baseline continuing to be set based on standard broiler or egg laying performance. The challenge for DAERA will be keeping emission factors up to date for ammonia reductions arising from such ongoing activities That will be key to giving credit to supply chains that embrace this approach.

- A farming focused organisation support and have advocated genetic improvement for many years but more Knowledge Transfer to farmers is required. They are supportive of the Ruminants Genetics Programme but disappointed that the sheep sector are not already involved in ongoing developments as sheep are ruminants.

- A farming focused organisation stated it is imperative that caution is taken in selection of breeding programme targets and traits. Animals should be selected for higher grazed and conserved forage feed ratios, their ability to convert grass should be the priority, and not performance based on cereal intakes. They encourage a broad view in relation to genetics as chasing a single trait can lead to the demise of other very useful traits. Close cooperation with colleagues in RoI was recommended as they appear to be further ahead on genomics.

- A farming focused organisation are supportive of improving feed efficiency through genetic improvement, but note it is vital that the ammonia inventory can be updated accordingly and expeditiously to give the industry the credit it deserves from any improvements made.

- An environment focused organisation are supportive of research which will help ensure those livestock kept specifically for production will be growing and producing as efficiently as possible. Caution was urged in selection of the targets and traits which breeding programmes are based on. Animals should be selected for higher grazed and conserved forage feed ratios. Any move away from this direction runs the risk of adverse criticism of the farming industry and the image it wishes to create of grass-fed meat from a clean green source. They are also very cognisant of the need to retain livestock which have particular value for conservation grazing. The benefits of lower-productivity animals, often of native breeds adapted to our climate and vegetation to manage habitats for their biodiversity value is well proven.

- Campaign response A and 11 individuals were supportive of the measure but stated that it should not be enforced.

- Individual responses also noted the time taken to deliver genetic improvements, differences between the ruminant and non-ruminant sectors, and the importance of protecting animal health and longevity.

Poultry producers do not select genetics

- Seventy-nine individuals stated that their poultry are provided, and they do not select the genetics.

Further information/research required

- SUMMARY - 5 organisations (3 environment focused,1 farming focused, 1 political party/ representative) and 11 individuals sought further information, including more on the provision of sufficient evidence for validation of measures. Further detail from responses is summarised below.

- 1 farming focused organisation and 7 individuals stated that within their industry they have a history of breeding for improved FCR via genetics, which will continue to remain a key focus. They asked how DAERA is practically proposing that they as a sector validate continually improving FCR in terms of reduced nitrogen excretion and ammonia emissions, and what would be considered sufficient evidence.

- An environment focused organisation stated that members were unsure how quickly this would make a significant impact on the problem, especially given the urgency of the situation and the need for radical reduction in ammonia.

- An environment focused organisation stated that strategy provides no clear proposals on how feed efficiency through genetic improvement will be achieved other than stating an existing work programme under the future agriculture policy framework, and that they therefore, we are not in a position to comment on its role in relation to reducing ammonia emissions.

Financial support required

- Four individuals were supportive of the proposals, as long as there was financial support for them.

Not supportive of the proposals

- Eight individuals were not supportive of the proposals. Two were not supportive of changing genetics, 1 felt it should be driven by industry and three provided no reason.

No comment/no firm views

- Seven organisations and 10 individuals had no comment or firm views on these proposals.

Question 12 - What are your views on the proposals to encourage tree plantations around livestock housing?

- In total there were 320 responses to this question, of which 28 were from organisations, 148 were from individuals, and 144 were from campaign response A.

- Answers were assigned to seven separate categories following consideration. The number of responses in each category is set out in Table 12 followed by summaries of the responses.

Table 12. Number of responses to question 12 by category

Category	Number of organisations	Number of individuals	Campaign response A
Need for greater urgency	1		
Supportive of the proposals	4	24	144
Qualified support	11	86	
More detail/information sought	6	6	
Not supportive of the proposals	5	17	
Needs financial support	13		
No comment	1	2	

Need for greater urgency

- One environment focused organisation stated that there needs to be greater urgency based on the best available science and practical research.

Supportive of the proposals

- SUMMARY - 4 organisations (2 Councils, 1 farming focused, 1 rural focused), campaign response A, and 24 individuals were supportive of the proposals to encourage tree plantations around livestock housing. Further detail from responses is summarised below.

- A Council welcomed this proposal as it will aid the reduction in emissions and also help the visual amenity and character of the countryside for new agricultural buildings in the rural area.

- A Council noted the role of tree plantations around livestock housing as a secondary mitigation technique and are also of the opinion that tree plantations have many additional environmental benefits, such as increasing biodiversity and carbon sequestration and will

play a role in achieving the UK's emission reduction targets for greenhouse gases. They also provide screening around housing units and should be encouraged.

- A farming focused organisation welcomed and supported this measure.

- A rural focused organisation supports the use of tree plantations around livestock housing, stating that as well as acting as a barrier to reduce the escape of ammonia from livestock housing it may act as a visual screen and contribute to tree planting and carbon reduction targets.

- Campaign response A and 10 individuals believe the plan is good.

Qualified support

- SUMMARY - 11 organisations (5 farming focused, 3 environment focused, 2 Councils, 1 water focused) and 86 individuals had qualified support for the proposals. Further detail from responses is summarised below.
- Two farming focused organisations stated that, while they recognise that tree plantations around livestock housing will capture ammonia emissions, given the proposed scale needed and specific locations required, this is totally impractical on most farms with the majority not having suitable sites of sufficient size and shape in the appropriate locations. It should also be noted that some housing will include fans which are designed to disperse emissions and therefore tree plantations are of limited benefit to these farms. There are concerns that encouraging tree planting close to farm buildings could result in potential insurance issues and devalues land. Risks to animal and flock health also need to be evaluated. Tree plantations close to yards will attract wildlife, such as badgers, and wild birds which could pose a threat to livestock and flocks therefore care needs to be taken. However, where farmers feel they can incorporate suitable plantations, this should be recognised and accepted by planning authorities as a mechanism to offset ammonia emissions. There may be some benefits to planting around some designated sites where the landowner is agreeable, but this would need significant long term financial support from outside the agriculture budget. There are current difficulties in sourcing suitable trees due to a lack of nursery stock and restrictions due to the NI Protocol.

- A farming focused organisation support the proposals but believe they will not suit many farms and farm layouts.

- A farming focused organisation and 34 individuals stated that, where it is suitable to do so, this technique for ammonia reduction should be employed. There should be a full written agreement between the farmer, Environmental bodies and DAERA detailing tree type, position, depth of the planting area etc. along with the agreed figure for mitigation over time before planting commences.

- A farming focused organisation support this measure in principle however the level of funding and duration of support needs to be increased – support should be in place for the lifetime of the building. Current woodland schemes are too short. In many cases these tree plantations will be on some of the most productive land and therefore the loss of production must be compensated. In many instances due to farmyard layout or position within the

holding this may not be practicable possible, and on smaller holdings it may require too large a land area to be viable.

- An environment focused organisation strongly supports this nature-based proposal, noting the potential to reduce ammonia emissions while delivering ecosystem services. The 5 and 10-year duration of various tree planting support measures are too short to encourage farmers to adopt these measures. DAERA is encouraged to use results from the Soil Nutrient Health scheme and build Lidar surveys and carbon measurements into the Ammonia Strategy, particularly in relation to bespoke targeting and buffer creation to incentivise and promote further tree planting on farms (i.e. policy linkages).

- An environment focused organisation was supportive but noted the time lag between planting of trees and achieving ammonia reduction benefits, meaning this measure will only have significant effect if carried out with a suite of other measures. There is no detail to enable them to understand how this would be translated into delivery, at what scale, and within what timelines. The Farming for Nature package has potential to encourage planting of green infrastructure such as agroforestry and wider hedgerows to help achieve many of the outcomes required across ammonia, biodiversity, carbon, and climate change policy frameworks. A knowledge exchange program is needed to demonstrate the benefits trees and hedgerows can bring to the farming system.

- An environment focused organisation took the view that if evidence supported the approach working to reduce ammonia deposition in the surrounding area, it would be beneficial. Members noted the importance of the species being suitable for the location, not creating perverse outcomes, ongoing management demands, and the potential for benefits to biodiversity and visual amenity.

- A Council noted significant ‘lead times’ before tree plantations are suitably established to effectively trap ammonia emissions, the need for careful management to maintain effectiveness, and that implementation must be verifiable.

- A Council support this measure resulting in additional biodiversity net gain or benefit but note that tree plantation devalues land therefore significant financial incentives to encourage the conversion of arable or grassland to woodland are required. The Council also notes issues regarding insurance where trees are planted close to buildings and difficulties in sourcing suitable trees or nursery stock due to supply chain challenges.

- A water focused organisation welcome planting native species deciduous trees if it can be shown to improve water quality. It will also have benefits for biodiversity and carbon sequestration. Planting should be encouraged in areas where soil erosion is an issue as it would help bind the soil together, creating a more stable soil structure and thus less sediment runoff into watercourses. Planting trees in the right places and in the right way, such as establishing wet woodlands could provide further benefits to water quality such as providing a buffer for potential run-off. They would not support the planting of conifers as the shallow root system causes soil instability and more runoff of sediments into watercourses. If a tree planting initiative implies a solution for 365-day housing, then they do not support this as a solution to this problem, rather extended grazing should be the solution.

- Individuals supported the proposals while citing practical concerns around the location of tree planting, vermin, building ventilation, suitability of land, and the need for full written agreements.

More detail/information sought

- SUMMARY - 6 organisations (4 environment focused, 1 farming focused, 1 political party/representative) and 6 individuals sought more detail and information on the proposals. Further detail from responses is summarised below.

- An environment focused organisation strongly welcomed recognition of the role that trees in farms can play to reduce the impact of ammonia emissions from livestock housing. They noted a number of factors for consideration within the context of the 2030 ammonia reduction targets. Tree planting to capture ammonia must be carried out in combination with, and not in place of, other measures to reduce ammonia emissions at source. It is important to plant the right species in the right layout, for example, trees planted closest to poultry housing should be of deciduous species as coniferous species tend to become matted with dust and feathers that are drawn out by ventilation systems.
  Given the immediacy and scale of ammonia reduction targets in Northern Ireland, it is vital that tree plantations around livestock housing takes place sooner rather than later.

- An environment focused organisation, while accepting that tree planting assists removal of pollutants from the atmosphere, wished to highlight a number of issues from the strategy in relation to this proposal. The strategy links to a tool developed by the UK Centre for Ecology and Hydrology (CEH) for removal of PM2.5 from the atmosphere not ammonia. Though “farm trees to air” is yet to be integrated into Northern Ireland, applying it in other parts of the UK highlight that achieving 15-25% as outlined in the strategy may be over ambitious. Any protection provided by tree belts requires a number of years before any effect can be provided, the depth of tree canopy is vitally important, and a considerable scale of planting will be required to result in any meaningful reduction to reduce impacts on sensitive sites. Any proposed land use change must be implemented using the principles of sustainable land use and the “right tree, right place” approach with an emphasis on native tree species, to enable delivery of ammonia reduction, climate mitigation and biodiversity improvements.

- An environment focused organisation stated that the strategy does not outline how it will work with farmers to increase the uptake of strategically planted trees around livestock housing within the strategy, including the level of uptake that would be required, the role of advice in choosing suitable trees to deliver multiple objectives, or the schemes that will be rolled out to deliver this.

- A farming focused organisation noted gaps in the strategy in relation to the number of trees needed per cow to be effective. There needs to be an assessment of the impact on the area of land currently used for milk production, and, consequently, the impact on milk production. There should be an indication of costs involved and impact on cash flow. Since it will take time to deliver results through this proposal, farmers who participate should be

given credit from the time of planting. Ongoing management costs over time should be recognised and compensation provided.

- A political party/representative stated that tree belt plantations can offer a good buffer-zone solution for catching some ammonia emissions but more context about the parameters of how strategic tree placement will be approached would be helpful. Consideration of how designated areas can be negatively impacted by poorly planned afforestation is required noting that the Peatland Strategy and Ammonia Strategy are interlinked, and restoration of semi-natural peatlands will be prioritised. Creating these tree belts should be encouraged where possible, but an assessment of where this is possible and how much of an impact this realistically has would be beneficial.

- Individuals asked questions including whether tree planting would let a farm increase its poultry flock, what density trees can be planted at to maximise trapping ammonia, who pays for planning and planting, and what happens when a farm doesn't own land downwind from their farm.

Not supportive of the proposals

- SUMMARY - 5 organisations (4 farming focused, 1 political party/representative) and 17 individuals were not supportive of the proposals. Further detail from responses is summarised below.

- A farming focused organisation stated that the ambition is reasonable, but there are significant and complex barriers to farmers planting trees close to their buildings and DAERA must acknowledge these barriers and work with other government departments to alleviate them if any meaningful progress is to be made. The barriers are planning, inheritance tax, and land values.

- A farming focused organisation would like to set aside tree mania as good land is needed to grow food, therefore, to help on the emissions front farmers could grow hemp which has thousands of uses and one acre of hemp sequesters more carbon and other emissions in one year than an acre of trees will do in twenty years. In addition, the year after hemp the land is rich in fertility and ready to grow food.

- A farming focused organisation stated that that this measure is total impractical on most farms – the vast majority will not have suitable sites in appropriate locations. It may have some benefits around designated sites but would need significant long term financial support from outside agriculture budget.

- A farming focused organisation stated that their major concern with this proposal is the risk of trees attracting wild birds, as for poultry farmers this will increase the risk of AI transmission. Other concerns are that for some poultry farmers with limited amounts of land, the proposal for a 20-100 m wide footprint that runs parallel to the poultry house will not be feasible. If trees are considered for a poultry farm, the potential value of the mitigation and the technical requirements (tree variety, distance of planting between trees

etc) must be agreed between the farmer, environmental bodies and DAERA before the commitment is made by the farmer. Many houses have requirements to extract such emissions through roof ventilation creating a challenge as to the height of the trees to capture these emissions.

- A political party/representative stated that, concerning this proposal, it would seem completely impractical to many farms due to the building or site location.

- Individuals were not supportive for reasons including: the focus needing to be on cutting emissions; not seeing any benefit to planting trees against a cattle house; the proposals not being practical; and the risk of trees being a haven for vermin and wildlife detrimental to biosecurity and disease control.

Needs financial support

- Thirteen individuals cited the need for financial support for tree planting and loss of value to farmland.

No comment

- 1 farming focused organisation and 2 individuals had no comment to make in relation to the proposals.

Question 13 - What are your views on how to encourage the safe covering of existing above ground slurry stores and lagoons?

- In total there were 306 responses to this question, of which 30 were from organisations, 132 were from individuals, and 144 were from campaign response A.

- Answers were assigned to six separate categories following consideration. The number of responses in each category is set out in Table 13 followed by summaries of the responses.

Table 13. Number of responses to question 13 by category

Category	Number of organisations	Number of individuals	Campaign response A
Measure should go further	4	2	
Supportive of the measure	1	63	
Financial support required	2	29	
Further considerations raised	15	19	144
Not supportive of the measure	5	10	
No comment	3	10	

Measure should go further

- SUMMARY - 4 environment focused organisations and 2 individuals felt this measure should go further. Further detail from responses is summarised below.

- An environment focused organisation sought stronger regulatory baselines through the establishment of enhanced conditionality for nutrient management planning and more robust cross-compliance, monitoring and enforcement, as well as mandatory adherence to the Code of Good Agricultural Practice for storing slurries.

- An environment focused organisation recommend that the strategy provides a clear end point in which it will be expected that all existing stores are covered as a minimum requirement, alongside support for capital investment e.g. grants, or soft loans during this transition period.

- An environment focused organisation stated that a realistic date needs to be agreed by which time this should be mandatory. There needs to be responsibility on the possible polluter to take measures to reduce clear pathways of emissions and we feel this is an obvious one. Any support in this measure should focus on enabling the covering of old stores by a given timeline. Covering new stores should not be supported as this should be the expected norm and these costs should be absorbed through the farm business. It is worth noting that this measure will only lead to a predicted 1-2% reduction and therefore we

suggest that the resource allocated must reflect this as other measures have the potential to deliver more value for money.

- An environment focused organisations stated that the measures are appropriate but must be introduced with an appropriate sense of urgency, based on the best available science and practical research, and new technologies introduced as they become available.

- An individual stated that the measure should be mandatory.

Supportive of the measure

- SUMMARY - 1 farming focused organisation and 63 individuals were supportive of the measure. Further detail from responses is summarised below.

- A farmer focused organisation and 23 individuals stated that, as this has been proved to have a positive effect on ammonia mitigation, it is an option that can be employed on appropriate farms with all new and upgraded tanks having it as a requirement.

- Further individual responses supporting the measure stated that: the measure makes sense; is a good idea; seems reasonable; has been proven to have a positive impact; and makes sense in high rainfall areas.

Financial support required

- SUMMARY – 2 farming focused organisations and 29 individuals stated that the measure requires financial support. Further detail from responses is summarised below.

- A farming focused organisation stated that it is imperative that DAERA make available sufficient financial support to the agricultural industry to be able to deliver the ammonia reduction measures outlined, noting that there has been no indication of what size of budget will be required or made available to do so, which must be urgently considered and published.

- Individual responses included: support for the measure with financial aid; the need for funding to support additional costs; the need for 100% grant support; and the need for the measure to be heavily subsidised.

Further considerations raised

- SUMMARY - 15 organisations (5 farming focused, 3 environment focused, 3 Councils, 1 water focused, 1 political party/representative, 1 AD focused, 1 planning focused), campaign response A, and 19 individuals raised further considerations in relation to the proposals. Further detail from responses is summarised below.

- A farming focused organisation stated that these proposals are impractical. There needs to be an engineering solution to make covering stores more practical and less of a health and safety risk. There will be cost involved, and DAERA funding should be available. There is

no indication in the document of how the ammonia released when mixing slurry prior to spreading can be minimised or eliminated. Funding should be available for research to develop technology to capture ammonia in various farming contexts. Existing slurry stores have a finite lifespan, and it is unlikely that it would be cost effective to incur cost in covering these that are approaching the end of their productive use.

- A farming focused organisation supported the proposal only where practical and financially supported by government.

- A farming focused organisation stated that they understand this is an area that can and has made progress. Setting the financial support at the correct level is crucial. The undertaking of doing this work is key – the current 40% grant is not a huge motivation (e.g. compare this to 60% grants under TAMS III in Republic of Ireland). Not all above ground stores will be possible to cover with above ground solutions. There is a lack of skills to implement on a 100% basis. Mobile and static separation should be considered for funding to deliver waste management networks, removing nutrients from farm that cause ammonia problems, and producing biogas.

- A farming focused organisation stated that the proposal makes sense and cost-effective options are needed.

- An environment focused organisation stated that, given high ammonia emissions from above ground stores (as opposed to below ground tanks) as far as possible within the grounds of human health and safety, we would encourage retrofitting of some form of safe covering on existing above ground tanks (bearing in mind the resource implications given approx. 80% of above-ground stores are currently not covered) and on all new ones. The resource allocated to this measure must reflect the prediction that it will only lead to a 1% overall agricultural emissions reduction and other measures have the opportunity to deliver greater value for money.

- An environment focused organisation recommends that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy.

- A Council welcomes the proposed measure, given its potential for ammonia reduction.

- A Council is of the opinion that while not all existing above ground slurry stores and lagoons will be suitable for retrospective covering due to potential health and safety risks, that DAERA should work closely with the industry to examine if these issues can be addressed and to develop ways of increasing the number of above ground slurry stores being covered or crusted, including, how the planning legislation can/should be amended if required.

- A Council support this measure, acknowledging that not all above ground slurry stores or lagoons would be suitable to cover due to health and safety reasons. Financial incentives should be provided to encourage uptake. Caution is urged caution in relation to installations of floating covers; the methodologies supporting such covers are, in the Council's opinion, not robust and may not deliver the anticipated or required ammonia emission reductions.

- An AD focused organisation agrees that covering stores and lagoons is good practice however, not all covers are suitable for all types of stores and lagoons. They encourage DAERA to avoid being too prescriptive to encourage selection of the most appropriate cover. The issue with requiring stores and lagoons to be covered is that particularly for older stores it can be expensive to retrofit. DAERA should consider grants or tax exemptions, to financially support farmers and operators in deploying the best solution.

- A planning focused organisation stated their agreement with comments in the consultation detailing potential issues with covering existing slurry stores.

- A water focused organisation stated that, where the structure can be safely covered this should be encouraged. It is likely that this would need to be through education of the issues to the farming community and incentives to assist them in making the changes.

- Campaign response A and 9 individuals stated that financial incentives will be required to encourage uptake and that it would be helpful if the department provided costings for this measure. In addition they require further information on a health and safety impact assessment/risks of retrospective covering of existing slurry stores and lagoons.

Not supportive of the measure

- SUMMARY - 5 organisations (4 farming focused, 1 political representative) along with 10 individuals were not supportive of the proposal. Further detail from responses is summarised below.

- A farming focused organisation feels that it is totally unacceptable that DAERA are considering this proposal and yet include no updated figures on the costs to the industry. It is widely agreed that the cost of installing covers on tanks either on new tanks or on existing tanks is significant with very limited benefits. The saving in tank space due to the reduction in rainwater will not offset the installation costs. It is concerning that the draft Strategy incorrectly outlines that new slurry lagoons must be covered when this is not the case as indicated in the NAP Guidance. Allowing the formation of a crust can result in reduction of emissions by up to 50% and therefore they question the real benefit of covering tanks. Rainwater entering tanks helps slurry consistency and particularly if LESSE is used, thinner slurry is necessary. More dilute slurry has lower ammonia emissions therefore covering tanks may not be as beneficial for emissions as suggested. Covering existing stores present significant challenges and must be removed from the proposals. Many existing stores will not be structurally fit to hold a fixed cover and floating covers present a number of difficulties and more importantly safety issues. The small proportion of slurry stored in outdoor stores in NI, will mean that covering existing stores potentially results in only limited ammonia mitigation. The AFBI ammonia scenario output work estimates that if all existing stores were covered this would only result in approximately 1% reductions in emissions in NI. While there are a number of options for floating covers there are concerns around all of these. Farmers who operate floating covers have highlighted a number of practical and safety issues. There are also issues with mixing tanks with covers, while there may be a mixing hatch on some of the plastic covers, this does not allow for a change in the mixing position. Mixing from the top of above ground stores is necessary, as the

internal pumps do not offer sufficient mixing of the slurry. Many farmers with above ground stores operate pumps that can be moved around the top of the tank to allow efficient mixing this would not be possible with a cover. The 'tented' covers present numerous challenges and have proved difficult to manage. Experience on farm has seen damage to tanks following strong winds increasing the risk of spillages/pollution. Also there is evidence of covers collapsing following snow. Snow lying on covers has also caused additional strain on the panels of above ground stores again resulting in structural damage. The build-up of gas under covers is a safety concern. Furthermore, above ground stores that use jet pumps to move slurry are unsuitable for covering. Covering existing lagoons present even more challenges due to the large surface area and will depend on how they are constructed. Some lagoons mix from several points and empty from various points and therefore this would be difficult if a cover is installed. There needs to be more research on the release of ammonia once mixing starts. While we accept that a cover will reduce emissions there needs to be a full analysis carried out on what happens when the tank is mixed and this must be clearly communicated to the industry. In addition, the amount of water going into above ground stores from rainfall and also from yard runoff will result in slurry being more dilute than the standard figures would suggest. This would result in ammonia emissions potentially being lower than the current estimates and therefore the benefits in terms of nutrient efficiency from covering tanks are probably over estimated.

- A farming focused organisation feels that it is unacceptable that DAERA are considering this proposal as the installation of covers on tanks has very limited benefit. Research shows that allowing the formation of a crust can result in reduction of emissions by up to 50%. Rainwater entering tanks helps slurry consistency and particularly if LESSE is used, thinner slurry is necessary. Also, more dilute slurry has lower ammonia emissions therefore covering tanks may not be as beneficial for emissions as suggested. Concern also lies with the covering of existing tanks; these tanks may not be structurally sound and therefore unfit to hold a fixed cover and floating covers present several difficulties and more importantly safety issues. The small proportion of slurry stored in outdoor stores in NI, will mean that covering existing stores potentially results in only limited ammonia mitigation. The AFBI ammonia scenario output work estimates that if all existing stores were covered this would only result in approximately 1% reductions in emissions in NI.

- A farming focused organisation oppose this measure for several reasons: costs; structural issues make it impractical on many existing tanks and lagoons; mixing issues; and build-up of gas.

- A farming focused organisation stated that the cost benefit of this measure is questionable with little benefit to the farmer. The % level of grant funding would need to be very high to encourage uptake and they would not be supportive of this measure as the risks and costs appear to outweigh the benefits.

- A political party/representative oppose this measure on the grounds of practicality and safety. The costs associated with projects are not practical to many farmers and the potential build-up of gasses dangerous.

- Individuals disagreed with encouraging safe covering of existing above ground slurry stores and lagoons the proposal for reasons including the expense, the small emissions reduction overall, the need to dilute slurry with water, costs, insurance, and safety concerns.

No comment

- Three organisations (1 environment focused, 1 council focused, 1 farmer focused) and 10 individuals had no comment in relation to this question.

Question 14 - What are your views on DAERA's plans to support ammonia reduction measures through Green Growth and future agricultural policy?

- In total there were 325 responses to this question, of which 28 were from organisations, 153 were from individuals, and 144 were from campaign response A.

- Answers were assigned to six separate categories following consideration. The number of responses in each category is set out in Table 14 followed by summaries of the responses.

Table 14. Number of responses to question 14 by category

Category	Number of organisations	Number of individuals	Campaign response A
All policies must be joined up	9	1	
Supportive of the plans	1	4	
More detail and information needed/suggestions made	11	60	
Financial support needed	3	39	
Not supportive of the plans	3	41	144
No comment		7	

All policies must be joined up

- SUMMARY - 9 organisations (6 environment focused, 3 farming focused,) and 1 individual cited the need for policies to be joined up. Further detail from responses is summarised below.

- An environment focused organisation stated it is essential that all policies and strategies work together in a coherent way and more needs to be done to achieve the necessary policy alignment to meet the challenging targets for ammonia, biodiversity and climate. They believe much more could be achieved by taking a more ambitious and proactive approach to supporting farmers to transition to regenerative farming, enabling them to deliver sustainable profitable farming systems which would also deliver societal benefits.

- An environment focused organisation responded that the Future Agricultural Policy should enable funding through its capital investment measure for this reduction programme. These should take the form of soft loans to ensure equity with those farmers who have already invested at their own cost to deliver improvements within their business and to ensure value for money. Any such investment should be time limited after which farmers will be expected to make improvements at their own cost. The Farming with Nature package could help to protect and restore habitats impacted by ammonia but must be supported by a strong

regulatory baseline. Use of public funds should be prioritised to fund restoration and management of impacted habitats, and not to reward farm businesses and other land managers for complying with (current or future) regulations and not polluting the environment.

- An environment focused organisation stated that integration of policies across DAERA and across government is vital. Clearly ammonia reduction is vital for protection of the natural environment and the services it delivers as well as for human health and must be a priority in all policy and action.

- An environment focused organisation welcomed plans by DAERA to support ammonia reduction measures through Green Growth and future agricultural policy. However, their view is that longer grazing seasons could be supported by Green Growth capital proposals for nature, this would support the proposal to integrate agroforestry (silvopasture) and their recommendation for hedgerow planting. They recommend that support for these measures is designed and administered in ways that complement each other. Funding through Green Growth and Future Agricultural Policy should not restrict access to forestry grants including the Small Woodland Grant, Forest Expansion Scheme or Woodland Investment Grant. To be effective the process of identifying grants must be simplified to enable farmers to establish the grant that best suits the needs of their farm business.

- An environment focused organisation responded that many of the proposed interventions aimed at reducing ammonia emissions and restoring priority habitats and designated sites that have been impacted by them sit naturally within future agriculture policy. Therefore they welcome DAERA's ambition to secure policy coherence between the ammonia strategy and NI's agriculture policy framework. Future agri-environment schemes are a key mechanism for restoring priority habitats affected by ammonia deposition, but there is no indication of the total budget that will be allocated towards such schemes between now and 2030. Finally, agricultural regulation and enforcement also has an important role to play in addressing the issue, but how this will operate within the new framework is still unclear. More work is required to ensure the ammonia strategy and future agriculture policy framework are truly joined up and do not result in perverse outcomes.

- An environment focused organisation asked what specific support measures are being advocated by DAERA to encourage implementation at the farm level, and welcome more detail on how agri-environment schemes will aim for a coordinated approach to deliver environmental benefits by encouraging group participation at a catchment or landscape scale.

- A farming focused organisation agree that Green Growth funding should be used to promote the outlined measures. A business case should be put to the NI Executive for additional funding to support these measures based on the public good they deliver and the lack of any real advantage to farm businesses. Because many of the measures are effectively non-productive for the farm business the level of funding will have to be considerable. The fact there is no commitment to any level of funding or any attempt at designing a scheme and attaching a proposed budget to it is very alarming. There is so much cross over between the ammonia issue and many other current issues that the thinking must start joining up and a well-designed and well-funded scheme that operates in

a simplistic nature must be co designed with wider industry before any reduction targets can be agreed.

- A farming focused organisation responded that while they acknowledge and support ammonia reduction measures through Green Growth and future policy initiatives, they believe it is important that we do not undermine an overall objective of climate action (which is to reduce and remove fossil fuels from the entire food production cycle including in fertiliser manufacturing) through any interim measures adopted in this ammonia reduction strategy.

- A farming focused organisation stated that the consultation talks about Green Growth Strategy as a cross cutting strategy and thus an Ammonia strategy should be part of this joined up environmental approach. It is sensible that ammonia reduction measures can access the Green Growth capital funds to deliver adequate funding to deliver both support for ammonia reduction and green transition investments. It is surprising that this is the only significant point at which policy seeks to be joined up, given the complementary nature some of the mitigations have with lowering carbon.

- An individual stated the critical importance that all these proposals are joined up and working to common goals so that ammonia reduction can work in tandem with Net Zero farming.

Supportive of the plans

- A Council and 4 individuals were supportive of DAERA's plans.

More detail and information needed/suggestions made

- SUMMARY - 11 organisations (8 farming focused, 1 environment focused, 1 Council, 1 AD focused) and 60 individuals required more detail and information or made further suggestions. Further detail from responses is summarised below.

- A farming focused organisation and 23 individuals stated that financial support for the implementation of ammonia reduction measures on farms will be necessary to ensure farmer buy in. Without sight of clear proposals it is difficult to give a fuller response.

- A farming focused organisation stated that having no current firm commitments on budget or scheme is concerning; there must be sufficient budget and a practical scheme to deliver.

- A farming focused organisation stated: to deliver the level of ambition within the proposed Strategy, DAERA must provide financial assistance to the industry. There are no firm commitments on budget, or a scheme proposed to reassure farmers that there is a genuine will within Government to assist with ammonia reduction measures. They propose a capital grant scheme be established in NI to improve environmental sustainability including tackling ammonia emissions, but it is imperative that this is more practical and flexible that previous schemes. While they welcome financial commitments that have been delivered to date to assist with equipment or buildings to reduce emissions through Manure Efficient Technology Scheme (METS), Farm Business Investment Scheme – Capital Tier 1 and Tier

2; all these schemes have been oversubscribed and underfunded. The FBIS has frustrated farmers with the 'Value for Money' element which results in farmers reducing grant support to help ensure they can avail of some funding from this competitive programme. 40% grant support rate is not sufficient to assist farmers and young farmers should be supported. The outdated Regulatory Impact Assessment indicates a net cost to agriculture of £43.65million per year. This economic analysis was presented publicly by AFBI in 2020 and fails to take into account considerable cost rises in the past 2 years on feed, fuel, fertiliser equipment and machinery. It is vital that these costs are revised to reflect more accurately recent inflationary pressures. Provision of adequate financial assistance towards the cost of ammonia mitigating measures is imperative. During other major policy changes, DAERA have brought forward financial schemes and incentives in tandem with policy proposals. It is unacceptable that DAERA are bringing proposals that could have a significant impact on the agricultural sector with only a vague commitment of possible support through Green Growth and Future Agricultural Policy proposals with no attempts made to draft, propose, or fund a mechanism or scheme to assist the industry. It is also vital that DAERA sequence timelines to ensure any support provided is of use and value. While they accept that once a policy becomes a legal requirement, DAERA cannot provide funding for that measure, it is vital that implementation dates coordinate with financial assistance to ensure those who need to avail have opportunity to do so. Failure to sequence financial support and legislative timelines appropriately will not deliver the changes required to reduce ammonia emissions. To do otherwise could be interpreted negatively by the industry as an intentional mechanism by DAERA to drive down production. They also reiterate that nature-based solutions such as peatland restoration and forestry should be funded from outside the agriculture support budget.

- An environment focused organisation recommend the final Ammonia Strategy sets out a long-term roadmap for achieving the 2050 emissions target, considering a wider range of drivers and pressures and that the final Ammonia Strategy's links with, and impacts on, other major policies and commitments, both national and international are clearly mapped. They welcome the commitment on page 10 of the draft Ammonia Strategy to 'Provide appropriate financial support for the implementation of ammonia reduction measures on farms through the Green Growth capital investment plan and relevant Future Agricultural Policy Programme Measures'. Limited details are provided on these delivery and funding mechanisms, and the risks and barriers associated with delivery. Detail is required, especially on the cost-effectiveness of the actions and investments needed and how these will align with the timing and structure of the proposed Farming for Nature Scheme, for example.

- A political party/representative stated there is no clarity as to the rate of payment per hectare under the Farm Sustainability Payment, and if this will be equal to the basic payment scheme. Many proposed mitigation measures will involve capital expenditure that the industry cannot afford. They do not support ammonia reduction measures being funded through a new future agriculture policy. DAERA should not cause further uncertainty to the farming community by employing this method to fund ammonia reduction measures.

- An AD focused organisation stated their support for DAERA's ambitious set of Green Growth Capital Proposals and their strategic outcomes: increased productivity, environmental sustainability; improved resilience; and effective functioning supply chain.

However, with 10 different Capital Growth Proposals, it must be made clear which funds and support measures can be accessed to directly mitigate ammonia emissions for farmers with digesters and users of AD-derived products, and that there is flexibility in the support given to guarantee that whichever measures AD operators and farmers choose to take, there is accessible support. Given that "Nutrient recovery and renewable energy systems (ammonia stripping)" is recognised as an important emerging technology in the Draft Ammonia Strategy, they urge AD technologies to be integrated into Green Growth Capital Proposals from the offset.

- A Council said that the aim (and test) of financial support must be to deliver reductions in emissions rather than to provide 'headroom' for new/additional emissions.

- A water focused organisation stated that a sustainable agricultural sector, reduction in intensity and delivery of water quality benefits through nature-based solutions are preferred.

Financial support needed

- SUMMARY - 3 organisations (1 Council, 1 environment focused, 1 rural focused) and 39 individuals stated the need for financial support. Further detail from responses is summarised below.

- An environment focused organisation recognises the linkages shown by the Department between its ammonia strategy and green growth capital proposals and support these but urge that sufficient capital allocation is made available to implement them. Ammonia reduction is such a critical matter for environmental and human health that farmers should be more aware that implementing these measures is crucial and that they must be given utmost priority if enforcement is to be avoided.

- A Council agrees that a holistic approach to tackling the climate crisis by balancing climate action with the environment and the economy is the right way forward as this has the potential to benefit all. They noted that Green Growth was developed following extensive stakeholder engagement with internal Northern Ireland Civil Service (NICS) Departments and external stakeholders from local government, the private sector, voluntary and community sectors and others. However these ammonia reduction measures may only be achieved if the appropriate financial support is provided.

- A rural focused organisation stated there will be a requirement for smaller farmers to receive support for many of the ammonia reduction measures proposed in the consultation, such as retrofitting ammonia reducing equipment to livestock housing, purchase or lease of new LESSE equipment or design and planting of tree plantations to act as a barrier. Such schemes must be strictly monitored to ensure they are achieving verifiable reductions in ammonia at farm level.

Not supportive of the plans

- SUMMARY – 3 organisations (1 Council, 1 farming focused, 1 political party/representative) campaign response A, and 41 individuals were not supportive of the plans. Further detail from responses is summarised below.

- A Council, campaign response A, and 30 individuals stated that the Basic Payment scheme worth approximately £300 million will come to an end in 2024. Farm support has been key to food production and its loss could affect agricultural production which could affect food security. An agricultural policy is being developed by DAERA; basic farm payment is to be replaced by a farm sustainability payment that will be area based and will use entitlements, but there is no clarity on the rate of payment per hectare under the Farm Sustainability Payment, and if this will be equal to the basic payment scheme. Many proposed mitigation measures will involve capital expenditure which the industry cannot afford. They do not want to reduce the size of the sector or add any additional costs as returns will not justify this. They do not support ammonia reduction measures being funded through a new future agriculture policy. DAERA should not cause further uncertainty to the farming community by employing this method to fund ammonia reduction measures.

- A farming organisation were against linking Green Growth & ammonia reduction proposals with future agricultural policy.

- An individual stated that a lot of support is not worth applying for as inflation rises are surpassing the grant aid set when drawing the scheme up and the maximum price set by DAERA is outdated by the time the scheme is up and running.

- Individuals also stated concerns related to the impact on food production, the need for food self-sufficiency, the growing world population, and how they would be impacted financially.

No comment

- Seven individuals had no comment to make on the plans.

Question 15 - What are your views on DAERA's plans for knowledge transfer and education on ammonia reduction?

- In total there were 300 responses to this question, of which 24 were from organisations, 132 were from individuals, and 144 were from campaign response A.

- Answers were assigned to six separate categories following consideration. The number of responses in each category is set out in Table 15 followed by summaries of the responses.

Table 15. Number of responses to question 15 by category

Category	Number of organisations	Number of individuals	Campaign response A
Supportive of the plans	7	38	
Qualified support	15	70	144
Importance of research and science stated		6	
Funding focused response		6	
Not supportive of the plans		7	
No comment	2	5	

Supportive of the plans

- SUMMARY - 7 organisations (3 farming focused, 3 Councils, 1 environment focused) and 38 individuals were supportive of DAERA's plans for knowledge transfer and education on ammonia reduction. Further detail from responses is summarised below.

- A farming focused organisation welcomes DAERA's plans for knowledge transfer and education on ammonia, stating it is essential that their members are educated on issues and policy going forward, as they are the farmers of the future.

- A Council supports DAERA's plans and state they should also include a detailed stakeholder communications plan. Appropriate funding and resources should be provided to ensure this is fully delivered and there is significant uptake from the industry. All farms should have access to advisors providing advice on ammonia issues.

Qualified support

- SUMMARY - 15 organisations (8 farming focused, 5 environment focused, 1 AD focused, 1 water focused), campaign response A, and 70 individuals had qualified support for DAERA's plans for knowledge transfer and education on ammonia reduction. Further detail from responses is summarised below.

- A farming focused organisation welcomes DAERA's plans for knowledge transfer and education on ammonia and have been working to communicate the ammonia issue through meetings, articles, and events. They are committed to raising awareness of this issue and welcome DAERA commitment to work with the private and voluntary sectors to demonstrate best practice in ammonia reduction technologies. While Business Development Groups (BDGs) are an effective means of communicating with some farmers, BDGs only target small percentage of the industry (around 3000 farmers) with some groups more successful than others. All farmers need access to advisers regarding ammonia advice. There are concerns that the current knowledge transfer measures including BDGs delivered by CAFRE will end in April 2024.

- A farming focused organisation are supportive of the proposed plans for KT and education activities, but these should be more widely available than BDGs and be farm specific and not generic.

- A farming focused organisation stated that DAERA has a duty to inform family farmers across Northern Ireland of new developments by AFBI and other research institutions, however, there must be an end to enforced knowledge transfer via government annual support as this is no way to take the farming community forward on any topic.

- A farming focused organisation stated that all farmers need access to advisers regarding ammonia advice which is currently not the case.

- A farming focused organisation and 42 individuals were supportive of CAFRE knowledge transfer and education, while noting the importance of advisors having the ability to gather accurate farm detail and calculate ammonia emissions to an accepted level.

- A farming focused organisation and 26 individuals stated that CAFRE knowledge transfer and educational groups have had significant buy in from the farming community in the past and will prove useful in ensuring that ammonia mitigation techniques are properly communicated. However accurate farm details must be gathered, and this will come down to work practices on that farm Therefore advisors who can demonstrate their ability to calculate ammonia emissions to a level which will be accepted by DAERA/NIEA will be an essential requirement.

- A farming focused organisation supports the need for knowledge transfer and education on ammonia reduction but are disappointed that there has been no reference to the work already done in the feed sector through the Feed Adviser Register. It is estimated that NI FAR members provide advice to approximately 40% of farms in NI, representing around 75% of all livestock fed and covering almost all dairy, pig, and poultry farms, thus highlighting its importance in helping address the environmental challenges facing NI agriculture. It is important that government departments and other industry stakeholders are also delivering KT support in this area, and it is vital that the messaging is consistent to maximise the value for delivering ammonia reductions.

- An environment focused organisation stated that an information and communication programme is essential and must be rolled out rapidly to all farmers to enable them to

quickly and effectively change their behaviours on farm in response to the ammonia problem.

- An environment focused organisation welcomed the incorporation of ammonia mitigation measures within the BDG programme and the opportunity to demonstrate best practice in nature-based ammonia reduction measures such as silvopasture, buffer planting, and hedgerows.

- An environment focused organisation welcome moves to embed ammonia reduction into existing and future knowledge transfer programmes and encourage DAERA to create knowledge exchange programmes with a specific focus on agroecological farming practices proven to deliver many of the objectives of the strategy e.g. integrating woodland effectively into farm businesses, improving soil health and achieving longer grazing seasons.

- An environment focused organisation stated that all these measures need to be set in the wider context of the transition required to enable the agriculture sector to play its part in addressing the nature and climate crises. It is important these actions are implemented as quickly as possible to achieve maximum impact and to enable farmers and land managers make the best short, medium, and long-term choices. To drive uptake farmers need to see that measures are relatable to their own farming system in their locality. A suite of tailored case studies and demonstration projects should be established to encourage innovation and uptake, a good example is the Soil Association farmers field labs.

- An AD focused organisation strongly supports plans for DAERA to transfer knowledge and education on ammonia reduction, and how to mitigate ammonia emissions from the AD sector. They encourage DAERA to knowledge transfer with other UK organisations both in the public sector (Department for Energy and Net Zer, SEPA, Natural Resources Wales etc.) and the non-governmental organisation sector (such as WRAP, etc.).

- A water focused organisation stated that knowledge transfer and education are fundamental for making progress and change and is supported however, it is important to ensure farmers understand the reasons for making the changes and that this is explained in simple, non-technical/scientific terminology. Providing farm advisors who are on hand to work with farmers and take them through the advice would be beneficial in ensuring success of any education and knowledge transfer scheme.

- Campaign response A and 4 individuals stated that education is always good. They support strengthening all-island collaboration on research and education to harness existing knowledge and maximise capacity to deliver strategic objectives with regards to agriculture, environment, economy, and rural communities across the island.

- Seventeen individuals stated the importance of advisors being able to gather accurate information at a farm level and calculate ammonia emissions at a level accepted by DAERA and NIEA.

Importance of research and science stated

- Six individual responses stated the importance of research and science-based evidence.

Funding focused response

- Six individual responses focused on funding; 5 of these responses did not support ammonia reduction measures being funded through a new future agriculture policy, and 1 sought clarity on funding and support.

Not supportive of the plans

- Seven individuals were not supportive of DAERA's plans for knowledge transfer and education on ammonia reduction.

No comment

- Two organisations (1 Council and 1 environment focused) and 5 individuals had no comment to make in response to the question.

Question 16 - What are your views on the proposals for spatially targeted measures around designated sites?

- In total there were 322 responses to this question, of which 28 were from organisations, 150 were from individuals, and 144 were from campaign response A.

- Answers were assigned to seven separate categories following consideration. The number of responses in each category is set out in Table 16 followed by summaries of the responses.

Table 16. Number of responses to question 16 by category

Category	Number of organisations	Number of individuals	Campaign response A
Proposed measures should go further	5	1	
Supportive of the proposals	1	1	
Qualified support/further suggestions	6	7	
Further information sought and recommendations made	8	91	
Concerns about impact assessment and LFAs	1	31	144
Concerned about and/or opposed to the measure	5	14	
No comment		6	

Proposed measures should go further

- SUMMARY - 5 environment focused organisations and one individual stated that the proposals for spatially targeted measures around designated sites should go further. Further detail from responses is summarised below.

- An environment focused organisation stated that it is vital spatial measures are implemented around designated sites, however the requirements stated seem to be insufficient. For example, there clearly should be no slurry spreading within far more than 50 m of a designated site given the data provided in this document.

- An environment focused organisation strongly recommend that spatially targeted measures are extended to include all ancient woodland sites in Northern Ireland.

- An environment focused organisation stated that consideration must be given to the recommendations' scientific rigour, for example, banning spreading of manure within 50 metres of a designated site has no scientific merit as a mitigation for aerial emissions. The distance from a designated site free from ammonia emitting installations and the land spreading of waste should be at least 650 metres as per the scientific evidence from the consultation. The scale of interventions proposed through the spatially targeted measures will pose significant challenges to the planning process. Existing and future permitting, and advisory staff will require increased capacity, training and resources in order to meet these demands and existing regulations and legislation.

- An environment focused organisation stated that it is essential that spatially targeted measures are implemented as soon as possible. Scientific evidence supports the need for a much more pro-active approach to mitigating the effects of ammonia on sites than has been the case up to now. We welcome the commitment to make the appropriate advisory and financial resources available to implement this tailored approach. This should be taken forward urgently, and prohibition extended to Areas of Special Scientific Interest (ASSIs) as they represent habitats and species of national importance.
  The proposed prohibition on spreading manures will help reduce ammonia concentrations and nitrogen deposition on Special Areas of Conservation (SACs) within the care of the organisation, however, where there is a known ammonia point-source adjacent to a site, a manure prohibition alone will not be adequate. These will require a "bespoke site-specific reduction plan for existing livestock housing and greater implementation of ammonia reduction measures" as proposed in section 4.2.3. Given the damage already caused and the urgency, they believe the introduction of the ban on spreading slurry within 50 m of Natura 2000 sites should be brought forward to January 2024, at least in areas of highest risk. They would also like to see the strategy pay more attention to the essential role monitoring and enforcement will have to play to ensure actions are having the desired results.
  Given the clear evidence base that excessive, locally deposited ammonia concentrations directly damages sensitive species, affects species diversity and condition of the habitat, they are concerned about the impact of ammonia on all semi-natural habitats, not just designated sites. Given we are in a nature and climate emergency, we need to tackle, at speed, all threats and pressures impacting on the fragmented semi-natural habitats across Northern Ireland.

- An environment focused organisation emphasised the devastating consequences of the status quo for designated sites and both NI and UK targets for nature recovery. Given the state of nitrogen and ammonia pollution across NI, the proposals need to express a sense of urgency, both in terms of reducing emissions, and in restoring habitats. A move to local scale GIS interpretation support to farmers and contractors to assist 'safer' (relatively) dispersal of slurry is one useful tool but overall volume increases from livestock and the drivers of this need to be addressed. There will be specific locality/site characteristics that will play a part in the final deposition of significant N on sites and habitats and in that sense spatially targeted measures could help but dominant wind vectors and overall emissions are also a factor in the actual loads. The mandatory measures proposed around all international designated sites are a one size fits all approach, despite the range of different habitats on sites. Surely there could be an advantage to a more site-specific approach that would tailor and target investment and mitigation to where it is needed.

- An individual commented that the measures were timid as distances are very short, designations under consideration exclude many ASSIs, and measures are not tailored to the characteristics of individual sites.

Supportive of the proposals

- An environment focused organisation and 1 individual expressed support of the proposals for spatially targeted measures around designated sites with no further comments.

Qualified support/further suggestions

- SUMMARY - 6 organisations (3 Council, 2 environment focused, 1 farming focused, 1 water focused) and 7 individuals had qualified support or made further suggestions on the proposals for spatially targeted measures around designated sites. Further detail from responses is summarised below.

- A Council considers the measures are necessary in pursuit of Article 6(2) of the Habitats Directive and further notes that '…Existence of these measures will provide reassurance to competent authorities in considering planning and permitting applications, and whether they align with the necessary reduction profile...It is intended that these interventions align with an emerging Operational Protocol which is designed to afford effective protection to our designated sites and provide greater clarity for authorities in determining capacity for sustainable agricultural development.'

- A Council welcomes these proposal as they will provide clarity for those wanting to develop livestock applications close to designated sites. They stated it is also fundamental that the revised operational protocol is published to accompany the implementation of this draft Ammonia Strategy to provide clarity and certainty to those proposing to build livestock installations that could impact on designated sites.

- A Council agree that there is an urgent need for a strategic approach to ammonia reduction around internationally designated Natura 2000 sites, however this should be tailored to individual site circumstances and provide appropriate financial and advisory resources.

- An environment focused organisation is committed to a landscape scale approach, in delivering nature recovery networks, and are implementing "Nature Recovery Zones" around their key reserves by engaging and collaborating with surrounding landowners/managers to buffer their nature reserves. These buffer zones should be implemented around all designated sites and are defined as "areas surrounding core areas that serve to protect them from the effects of any damaging external activities. These areas should aim to reconcile biodiversity conservation and economic activities, compatible with the protection of the core area they surround". However they do not feel it is necessary or appropriate to have a blanket 50 m exclusion zone around all designated sites. There is a clear gradient of sensitivity and risk to designated sites and this should be drawn up to reflect the need for and recommended width of an exclusion zone. Given that all slurry will

be spread by LESSE by 2026, this will further minimise the risk to sensitive sites and make a 50 m exclusion band excessive and unnecessary on many sites. They welcome the Department's commitment to making appropriate advisory and financial available resources to support a site-specific targeted approach to buffer zone width and support the measures but encourage the Department to start encouraging the regulation of spreading on a bespoke, tailored basis, for all Natura 2000 designated sites by Jan 2024 rather than 2025.

- An environment focused organisation stated that spatially targeted measures outlined within the strategy, if implemented effectively, will make a significant contribution to meeting the aims of the strategy. The scale of interventions proposed through spatially targeted measures will pose significant challenges to the planning process. Existing and future permitting and advisory staff will require increased capacity, training, and resources to meet these demands and existing regulations and legislation.

- A farming focused organisation welcomed this proposal as it provides clarity for those wanting to develop livestock applications close to designated sites, it is also fundamental that the revised operational protocol is published to accompany the implementation of this Strategy to provide clarity and certainty to those proposing to build livestock installations that could impact on designated sites.

- A water focused organisation stated that spatially targeted measures are important and supported around designated sites. Much of the water abstracted for drinking water in N Ireland has its source in upland catchment areas which are designated habitats. These areas are susceptible to damage due to ammonia deposition, which damages habitats and biodiversity, but also can result in poor water quality through runoff from degraded or eroding peatlands. It is essential that these areas are not only protected, but also incentives are put in place so that these uplands can be restored and enhanced.

- Three individuals stated that significant levels of ammonia reduction can be achieved on particular sites if the appropriate technologies are employed.

- Two individuals had provisos related to the proposals, that they did not reduce efficiency of farming operations or close down farms.

- An individual suggested that for farms near Ramsars with highly productive agricultural land there might be tie in with Councils to generate other income streams taking farmland out of production and into tourism or providing cycle ways for example. They also suggested creation of long-term management agreements with farmers to facilitate green infrastructure, adding more tree and hedge planting to increase biodiversity along proposed greenways.

Further information sought and recommendations made

- SUMMARY – 8 organisations (7 farming focused, 1 environment focused) and 91 individuals sought further information on the proposal or made recommendations.

- A farming focused organisation stated that the proposals could result in loss of productive land, which they would not support. Farmers should be compensated for any loss of productivity, and costs incurred. An impact assessment should be carried out on each affected farm to inform compensation.

- A farming focused organisation stated that the proposals would create ridiculous sized boundaries and reduce the farmer's ability to farm his land to its potential. Protection of areas around designated sites must be on a sound evidence-based site by site approach.

- A farming focused organisation and 34 individuals stated that significant levels of ammonia reduction can be achieved on particular sites if the appropriate technologies are employed and ask: who decides the appropriate reduction for a specific designated site; who agrees the % reduction required by all emitters or one single emitter within 1 km or 7.5 km of the designated site; and who will be the decision makers? For spatial targeting all bodies must consider the cause, appropriate technology or practice, agreed effect if certain changes are made, cost of implementation, operational cost and timeline for implementation before any changes are enforced.

- A farming focused organisation stated that, while narrative in the strategy specifically refers to Natura 2000 sites, Question 16 is broader and refers to designated sites, and the consultation refers interchangeably to "designated sites", "internationally designated sites", "Special Areas of Conservation" and "Areas of Special Scientific Interest". The Regulatory Impact Assessment does not specifically assess the impact of this more stringent target specifically. It is therefore difficult to ascertain the scope of the strategy, without understanding where and how much of NI will fall under one of these headings, and how many producers are likely to fall into "special measures" now and in the future (given the UK's recent adoption of the Kunming-Montreal Global Biosecurity Framework). Whilst spatial targeting measures will be necessary it is unclear if those measures will be applied as a "one size fits all" or will be proportionate to the level and type of emissions arising from farm point sources. They are concerned that plans have already been prepared in some areas without engagement with those most affected and most able to contribute to a successful outcome. Financial support for landowners to restore habitats must be available to ensure the overriding concept contained in the green growth and environmental policies of "a Just Transition" so farming does not bear a disproportionate cost of the policy required to deliver a public good."

- A farming focused organisation supports the idea of spatial measures being implemented around designated sites but are unable to support this measure in its current form. Proper engagement with the farming community affected must happen before any such measure is agreed. Blanket proposals are a crude means of addressing this issue and unlikely to prove successful. This proposal also fails to address how farmers are to be compensated for loss of production or increased costs associated with the implementation of any special spatially measures forced upon them.

- A farming focused organisation highlight concerns around the implications stemming from the UK government having signed the Kunming-Montreal Global Biosecurity Framework and the obligations contained therein. In particular the commitment to ensure at least 30% of terrestrial, inland water and coastal and marine areas are protected is of concern as

there is no clarity around how much of NI will be brought in to contribute to this UK target, what the extent of the protection will be required and what the implications of this will be for production. Increasing the scale of designated areas in NI could impact significantly on agricultural production and potentially devalue land areas.

- A farming focused organisation stated that the proposals are a further erosion of value of land near or in designated sites and will have the opposite effect to that which DAERA wish. DAERA should be firmly promoting the value of natural land; if the land value increases then those who own it will want to maintain it. Adding legislation and cost to those near designated sites will means farms in that vicinity are less sustainable and less able to take the costly action DAERA wishes them to. Targeting of interventions near designated sites should be limited to the prioritization of financial aid – i.e. if you are close, you are more likely to get a grant, or will receive more money for your interventions.

- An environment focused organisation recommends that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy. The importance of spatially targeted ammonia reduction for designated sites is set out on pages 57 to 58 of the draft Ammonia Strategy. This will be critical for achieving the 2030 and the long-term designated sites targets to improve the environment. There is insufficient detail in the draft Ammonia Strategy on the area over which spatially targeted measures will be applied and how these measures will be delivered. They would like to see this detail provided in the comprehensive action plans they have recommended to accompany the final Ammonia Strategy. Firstly, it is unclear if this measure will also prohibit the spreading of manure within the boundaries of designated sites. Secondly, if the intention is to remove sources of ammonia close to designated sites, then clarification is sought on why other ammonia-emitting inorganic and organic fertilisers are not included in the 50 m exclusion zones. Thirdly, on page 27 of the draft Ammonia Strategy the impact of emissions from farms and agricultural activities can be very high beyond this proposed threshold of 50 m, with ammonia concentrations found to be at or above critical levels 650 m from a source. It is therefore unclear why the 50 m has been selected as the boundary. Nitrogen Futures Report modelled exclusion zones (or Emission Displacement Zones, EDZ) of one km from the boundaries of designated sites in which no slurry or manure was applied. Evidence presented suggests that proposed prohibition on spreading of manures within 50 m of a designated site as recommended on page 57 would be inadequate and a much wider exclusion zone would be needed to improve the condition of designated sites. As such further clarification is required on the effectiveness on the current proposal of 50 m. If a larger exclusion boundary is proposed within the final Ammonia Strategy, appropriate financial support for farmers and land managers would be required for example, through agri-environment or circular bioeconomy schemes.

- Twenty-six individuals asked who the decision makers are in the process, with a number also asking who decides the % reduction at specific site, and who decides the specific reductions for individual farms.

- Six individuals stated that all bodies need to be involved in the conversation about spatial targeting.

- Seven individuals sought further information on the financial implications of the proposals for farmers and asked how those impacted by the proposals would be compensated.

Concerns about impact assessment and LFAs

- SUMMARY - A Council, campaign response A, and 31 individuals cited substantial or significant concerns with the proposed spatially targeted measures having a negative financial impact on farms which are located in the specific areas. Further detail from responses is summarised below.

- A Council has significant concerns regarding the proposal for spatially targeted measures around designated sites, much of which is concentrated on land that is designated as Less Favoured Areas (LFAs). The Council is concerned that this group of farmers will be particularly adversely impacted by these measures and, given the demographic, this potentially gives rise to an equality issue on the grounds of religious belief which must be fully assessed. The Council seeks information on the number of farmers and extent of land which will be affected alongside clarity on how the affected farmers will be compensated given that farming will not be viable or sustainable in these 'spatially targeted' areas. Many of the designations with the Council extend into the Republic of Ireland (ROI). There is no specific consideration of the designated sites in ROI and reducing impacts on them, or how emissions from ROI are considered in the strategy. The Council would encourage DAERA as part of the consultation process to engage directly with the statutory nature conservation body for sites in Ireland who is represented by the National Parks and Wildlife Service. A cross border approach will be required to ensure the success of the strategy and measures contained within it. The Council is of the view that the review of the operational protocol is intrinsically linked to this matter and will be a critical factor in the delivery of the targets and measures within the strategy, through the planning process.

- Campaign response A and 31 individuals have substantial concerns on the proposal for 'Spatially targetted' measures around designated sites. DAERA's equality and disability screening document shows that designated Special Areas of Conservation (SACs) are mostly concentrated on land that is classified as Less favoured Areas which is associated with a particular equality group namely religion. DAERA have provided no information on how they would compensate farmers. There is no information on the number of farmers or the amount of land that could be affected. Farming will not be sustainable and viable in those areas impacted by 'spatially targeted' measures. This measure if implemented would reduce production substantially making farms financially unviable. They cannot agree to this 'Spatially targeted' measures in the absence of a proper Rural Impact Assessment detailing the specific social and economic impacts on farmers and rural communities in Less Favoured Areas (LFA's). In the proposed draft Ammonia Strategy's equality and disability screening paper, DAERA indicate there could be a 'very significant' impact with the scale of the impact determined by specific farm characteristics by farm size, type, and designation. Farms could be impacted by the regional wide strategy to reduce ammonia or 'spatially targeted' measures or both. DAERA highlight that farm activities could also be potentially impacted by any new operational protocol. Consequently, based on the information DAERA has provided in its consultation document it would be expected that farms in Less Favoured

Areas (LFA's) will be disproportionately impacted by the regional wide strategy, spatially targeted measures, and the development of any new operational protocol.

Concerned about and/or opposed to the measures

- SUMMARY - 5 organisations (4 farming focused, 1 political representative) and 14 individuals expressed concerns about the impact of the proposed measures. Further detail from responses is summarised below.

- A farming focused organisation are very concerned about the targeted measures and totally opposed to this proposal. They believe these measures will have a very significant impact on farms in these areas yet there is limited detail on this part of the Strategy. There has been no proper modelling or economic impact assessment carried out by DAERA/NIEA on the targeted measures. There has been a complete failure by Government to properly assess the number of farms impacted, farm types and area of land. Without this information it is impossible to accurately carry out the various assessments that are required as part of the consultation process. The Equality Impact Assessment screening template clearly indicates that the proposed spatial elements around designated sites 'may have an impact on those of different political opinions due to the geographic location of designated habitats'. The level of this impact is outlined as 'major' which is clearly concerning and necessitates the need for a full EQIA to be completed. The proposal to prohibit spreading of manures within 50 m of an internationally designated site by 2025 is totally unacceptable and will lead to unintended consequences with farmers likely to opt to maintain production and therefore increasing chemical fertiliser in this buffer resulting in perverse environmental outcomes and major increases in cost. The proposals to limit spreading will have a very significant impact on farms around the internationally designated sites. This approach around targeted sites is totally divisive and will devalue farms in those areas. Land that is designated is already devalued and it is concerning that these 'zones' will further reduce the market for land within those areas. These measures are totally unacceptable, and we are extremely concerned that they could lead to much wider restrictions to all those farming 'close to' designated sites.

- Three other farming focused organisations also stated they are very concerned about these proposals and made comments which are included within the response of the farming organisation above.

- A political party/representative expressed substantial concern around the targeted measures, stating that they will have major impact on farms in Fermanagh. These measures might lead to greater restrictions in future. It seems that no proper modelling has been conducted nor impact assessment carried out. It is in their view that this could even devalue farms within these areas if this proposal goes ahead and they therefore oppose such measures.

- An individual expressed concerns that due to their farm layout, with most of their land running alongside an SAC, the amount of land they have available for slurry spreading would be greatly reduced and asked how they would be able to apply all their slurry annually with a much reduced available land area? They asked if consideration been given

to compensating the farmer effectively for loss of land (for slurry spreading and for loss of production due to lower nutrient application on this 40m belt (as outside of February and October slurry should not currently be spread within 10m of a watercourse).

- An individual stated that this unfairly penalizes those businesses that are unfortunate enough to be near one of these sites.

- An individual stated there is no proof that farming is doing these sites any harm.

- An individual stated this will have minimal impact on the designated sites but will have a huge detrimental impact on the value of farmland in these areas by reducing the productive potential of the land

No comment

- Six individuals had no comment to make in relation to this question.

Question 17 - What are your views on the proposed conservation actions to restore habitats and support sustainable development?

- In total there were 304 responses to this question, of which 25 were from organisations, 135 were from individuals, and 144 were from campaign response A.

- Answers were assigned to five separate categories following consideration. The number of responses in each category is set out in Table 1 followed by summaries of the responses.

Table 17. Number of responses to question 17 by category

Category	Number of organisations	Number of individuals	Campaign response A
Greater urgency required	3		
Supportive of the proposed actions	7	12	
Further information sought and recommendations made	13	113	144
Not supportive of the proposed actions	1	6	
No comment	1	4	

Greater urgency required

- SUMMARY - 3 environment focused organisations cited the need for greater urgency in restoring habitats. Further detail from responses is summarised below.

- An environment focused organisation expressed disappointment that the intended call for evidence on an Operational Protocol to assess the impacts of air pollution on the natural environment was not published in tandem with this strategy, risking delay in implementation of some of the key measures to mitigate the impact of ammonia emissions. Given the clear evidence base that excessive, locally deposited ammonia concentrations directly damages sensitive species, affects species diversity and condition of the habitat, they are concerned about the impact of ammonia on all semi-natural habitats, not just designated sites. Given we are in a nature and climate emergency we need to tackle, at speed, all threats and pressures that are impacting on the fragmented semi-natural habitats across Northern Ireland. All the proposed conservation actions mentioned have merit and will be essential. They welcome the fact that Conservation Management Plans are being prepared for all SACs and are keen to see these published for consultation and support ongoing research and development of projects to consolidate the evidence base. They recognise that DAERA "want to" support landowners and secure funding, but this must be translated into delivery, funding allocation and regulatory enforcement. Chapter 5 fails to highlight that the NI Biodiversity Strategy and other key strategies / recommendations are also interlinked. In order to meet the Convention on Biological Diversity (CBD) targets agreed at COP15, the

ammonia strategy must be a key enabler for nature recovery up to 2032 and must not work against the aims of current key policy documents and legislation including the peatland strategy, biodiversity strategy, Blue Carbon Action Plan, UK Clean Air Strategy and Climate Change Committee recommendations. They recommend that Areas of Special Scientific Interest (ASSI) should also avail of the proposed conservation actions to protect and restore nature.

- An environment focused organisation welcomes actions to conserve and enhance the functioning of ecosystems. All protected sites need appropriate conservation management plans and urgent completion of any outstanding plans is essential. Support for this management planning needs to be prioritised in all DAERA policies related to Nature and Biodiversity support.

- An environment focused organisation stated that the state of our designated sites is poor with only 1 of 49 being in good conservation status and clearly much greater action must be taken to repair and restore habitats. Activities proposed are general and laudable, but require much greater commitment, investment, and urgency. The Environment Strategy and upcoming Biodiversity Strategy need to provide much greater specificity and detail on actions, and they should be integrated into this strategy when available. Current suggestions are vague and not 'SMART', or inclusive of monitoring and reporting targets, so unlikely to be effective.

Supportive of the proposed actions

- SUMMARY - 7 organisations (3 Councils, 2 environment focused, 1 farming focused, 1 water focused) and 12 individuals were supportive of proposed conservation actions to restore habitats and support sustainable development. Further detail from responses is summarised below.

- Two Councils welcome the proposed actions.

- A Council acknowledge that many of our special habitats and species features across our protected sites are in unfavourable condition due to nitrogen deposition and a range of other pressures and threats. Protected habitats require on-site conservation actions to address these current pressures, particularly as the impacts of ammonia and nitrogen deposition can be more significant where other issues are not being addressed. They recommend DAERA publishes an updated Operational Protocol for assessing air quality impacts without further delay.

- An environment focused organisation welcomed the proposed measures including woodland creation, buffer planting, agroforestry (silvopasture) and natural regeneration, so that they can maintain their natural functions, biodiversity, and ecosystem services.

- An environment focused organisation recommend DAERA publishes an updated Operational Protocol for assessing air quality impacts without further delay. They recommend that DAERA publishes the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy. They agree with the draft Ammonia Strategy being structured around the two pillars of ‘an ammonia reduction programme’ to

cover all of Northern Ireland and more focussed ‘conservation actions to protect and restore nature’ and note the success of Pillar two is dependent upon the successful delivery of Pillar one. The importance of conservation management plans for designated sites is stressed and these will be critical for achieving the 2030 and long-term designated sites targets. Research they have commissioned highlights that each designated site will require different percentage reductions in ammonia concentrations, therefore, each site is likely to require a bespoke management to address ammonia. The commitment for conservation management plans to be prepared for the full suite of 58 terrestrial SACs by December 2022 was made and they look forward to the publication of these conservation management plans setting out the measures to address ammonia and nitrogen deposition. Similar plans will be needed to address the impacts of ammonia at all designated sites which are sensitive to ammonia.

- A farming focused organisation support conservation and restorative actions concerning protected sites.

- A water focused organisation strongly support the inclusion and incentives for conservation measures. Peatlands are an important asset in Northern Ireland, covering 12% of the land area, yet 86% are degraded and only about 1% of the peatland area has been restored over the last 30 years. As a result, the potential benefits of peatlands for people and nature in terms of water quality, natural flood management, and wild places for people to enjoy are compromised. Furthermore, the loss of soil carbon due to peatland degradation contributes to climate change. Thus, there is scope to align future peatland protection and restoration policy with other developments in the policy landscape, delivering multiple objectives. DAERA is currently in the process of developing a peatland strategy for Northern Ireland, which will set the ambitions to protect and restore peatlands over the next 20 years and beyond. Peatland restoration offers a major opportunity to respond to the growing climate and biodiversity emergencies and at the same time support rural livelihoods.
  The potential benefits for the supply and treatment of raw water for public use is a key driver of peatland restoration for the organisation. Degradation of the peat due to loss of vegetation cover, due to overgrazing, ammonia deposition and drainage, reduces the reliability and quality of raw water. This increases the costs of water treatment to remove colouration and materials in suspension from the peat-stained water. A high organic content also increases the risk of contamination by disinfection by-products. Peatlands in favourable condition provide high quality raw water that is potentially cheaper to treat for public supply. Degraded peatlands release higher concentrations of organic carbon into the water causing ‘brown water’, which has to be removed at high cost. Peatlands in favourable condition also provide a water storage role and this will become increasingly important in terms of water supply as the impacts of climate change such as hotter summers and droughts become more frequent.
  They agree with the requirement to support farmers to restore habitats and the need to provide them with the necessary education, advice, and funding along with the provision of opportunities in future agricultural schemes. They also support the objective to secure funding to facilitate long-term restoration and management of important protected sites and wider landscapes particularly given that many of these also play an important role in enhancing drinking water quality and quantity.

- An individual stated that it is essential for SACs and SPAs to receive appropriate protection.

- An individual stated that restoring some habitats is definitely needed, and reducing grazing livestock on them would be a big help.

Further information sought and recommendations made

- SUMMARY - 13 organisations (8 farming focused, 3 environment focused, 1 Council, 1 AD focused), campaign response A, and 113 individuals sought further information on the proposed conservation measures or made further suggestions. Further detail from responses is summarised below.

- A farming focused organisation support commitments to help landowners restore habitats but more detail is needed on this approach; no budget or details of schemes have been outlined to deliver the various actions. Measures which will result in generational change of land use must be funded from outside the agriculture budget. They were concerned and insulted by DAERA's suggestion of the need to support 'traditional farming practices' on page 59; this suggests taking the industry back in time which is completely inappropriate. Farming in the 21st Century is more efficient, environmentally sustainable and has significantly improved standards than at any time in the last 50 years and has kept up with demands to feed a growing population.

- A farming focused organisation and 11 individuals state that is essential that Special Areas of Conversation (SAC), Special Protected Areas (SPA's), Ramsar sites etc receive appropriate protection, however they have an issue with ensuring that the appropriate science is concluded first and everyone living and working close to that site is 'bought into' the overall agreement. They asked if Conservation Management Plans (CMPs) have been written in conjunction with the respective farmers, and if the farmers understand fully the commitments required by them. As the farming population is generally viewed as having the greatest effect upon these sites of interest, before and after the CMP's have been written, their understanding and buy in is a necessity.

- A farming focused organisation stated that there is keen interest in restoring habitats and supporting sustainable development. Indeed, a sustainable environment is both necessary for and dependant on a sustainable farm base that can actively deliver the public good that habitats and environment represents. However to deliver on this requires active engagement with producers including on the development and implementation of individual plans. They are concerned that such plans already have been prepared in some areas without engagement with those most greatly affected and indeed most able to contribute to a successful outcome. Financial support for landowners to restore habitats must be available in order to ensure the overriding concept contained in the green growth and environmental policies of "a Just Transition "such that farming does not bear a disproportionate cost of the policy required to deliver a public good.

- A farming focused organisation stated that in principle they have no issue with the proposed conservation measures provided that any loss in production or increased costs associated with a change in management is suitably reimbursed or rewarded. Current schemes are too underfunded to be attractive enough to deliver desired outcomes and are generally too prescriptive in their nature. Current schemes are also limited by virtue of the fact that only

designated land is eligible for area-based payments. This needs to be reviewed in future policy. Any funding for restoration works of habitat etc must come from outside the current agricultural budget. They reiterate that the thinking on the proposals or suggested methods of resolution in this document do not consider aspects of wider DAERA policy – i.e. continuing use of EFS schemes to deliver outcomes – Both are planned to be phased out in the very near future.

- A farming focused organisation stated that conservation actions to restore habitats and support their existence need to be carried out with local farmers knowledge being respected and acted on.

- An environment focused organisation strongly supports these measures as outlined in Pillar 2 and particularly encourage the Department to recognise, consult with and consider the recommendations of the substantial body of experience and knowledge which currently exists within the environmental NGO sector. They welcome the Department's linking of the Ammonia strategy to the Peatland strategy but would like to see firm, costed commitments to delivery in this area. They fully support proposals to build ammonia reduction measures and Critical Levels and Loads considerations into SAC Conservation Management Plans as outlined and strongly encourage the development of such plans with ROI counterparts. Prioritising funding for peatland restoration will directly help ameliorate the impact of ammonia deposition on these habitats.

- An environment focused organisation stated that this section is much less detailed, with no SMART targets, relying heavily on links to current agri-environment, future agricultural policy measures, and national targets and strategies without any real proposals. The reference to Conservation Management Plans is also premature as these plans have yet to be put out to consultation. These plans should include: site-specific nitrogen action plans; incorporation of deposition levels and impacts into monitoring assessment and management of protected areas including ASSIs, SACs and SPAs for example; integration of N deposition into biodiversity strategies with targets for mitigation and restoration of habitats and ecosystem; production of social and economic assessment of impact of air pollution on species and natural and ecosystem services; support for further research to improve evidence base.

- An environment focused organisation state that the proposed conservation actions could have a significant beneficial impact if implemented on a sufficient scale. The strategy falls short in identifying what level of uptake is required to deliver the objectives of the ammonia strategy and in delivering other environmental targets and commitments in Northern Ireland. This is a crucial area of work which will be important in determining what budget is required under future payment schemes aimed at protecting and restoring nature on farms across Northern Ireland. They encourage DAERA to publish details in this area as a matter of urgency.

- A Council suggest that consideration be given to demonstrate the effectiveness of any proposed action or intervention in relation to the biodiversity benefits. Evidence tends to focus on the benefit on reducing ammonia emissions, and then benefits for biodiversity are inferred.

- An AD focused organisation state that, if the use of digestate derived products for horticulture were to be pursued to replace peat, DAERA should ensure that appropriate guidance, legislation, and regulation is implemented to permit this avenue of use for digestate.

- Campaign response A and 3 individuals stated that this measure needs proper funding from a new funding stream and should not be taken out of existing farm funding and more information is needed on this approach. They also note the department has not outlined a potential budget or scheme under Pillar 2 and recognise the burden of designated land on farmers. DAERA refers to support for 'traditional farming practices': more information should be provided on what is meant by this term as it could be implied taking farmers back in time which may not be appropriate.

- Thirty-seven individuals asked for more information on Conservation Management Plans including the need for agreement with landowners, details of who would be affected by them, and how an individual would know if they are to be impacted by them or should be involved in their design.

- Eight individuals believe this measure needs proper funding from a new funding stream and not to be taken out of existing farm funding.

- An individual stated that funding should be made available to farmers for habitat restoration. If land is taken out of production, there will need to be long term funding due to result of loss of income from this land.

- An individual stated that the landowner would have to be at the forefront of any of these developments and be financially compensated.

Not supportive of the proposed actions

- One farming focused organisation and 6 individuals were not supportive of the measures.

- The farming focused organisation oppose further measures being imposed on farms close to sites without any detail on who and where, or information on compensation / financial assistance.

No comment

- One farming focused organisation and 4 individuals had no comment on the proposals.

Question 18 - What are your views on the appropriate delivery and funding mechanisms to deliver habitat restoration?

- In total there were 321 responses to this question, of which 23 were from organisations, 154 were from individuals, and 144 were from campaign response A.

- Answers were assigned to six separate categories following consideration. The number of responses in each category is set out in Table 18 followed by summaries of the responses.

Table 18. Number of responses to question 18 by category

Category	Number of organisations	Number of individuals	Campaign response A
Policies should go further	1	1	
Supportive of habitat restoration	2	5	
More information/detail required on the proposals	6	6	
Funding information sought or suggestions made	10	132	
Not supportive		4	
No comment	3	7	

Policies should go further

- SUMMARY - An environment focused organisation and an individual made suggestions on how policies in this area should go further. Further detail from responses is summarised below.

- An environment focused organisation stated that agriculture policy should be fundamentally reformed, and payments should be made to farmers based on the delivery of environmental public goods. During transition to the new agriculture policy framework costs of remedial measures and capital investment should derive from the core agriculture budget. Investment in nature-based solutions to specifically address the ammonia problem should be additional investment derived from the transfer of funds from Basic Payment Scheme (BPS)/resilience payment.

- An individual asked if other businesses that generate a lot of carbon could not off-set and buy into habitat creation in NI, taking unfavourable farming land out of production and into, for example, wet woodland creation.

Supportive of habitat restoration

- SUMMARY - 2 Councils and 5 individuals were supportive of habitat restoration. Further detail from responses is summarised below.

- A Council welcomed the plan for specific Conservation Management Plans and would welcome the opportunity to be involved with the pilots. They stated that sustained funding will be key to ensure habitat restoration, species recovery, and nature recovery.

- A Council suggested maximising opportunities through future agricultural policy frameworks to support nature recovery and low emission farming, with funding for farmers to support long-term restoration and management of protected sites and wider landscapes, along with legislative monitoring and annual progress reporting.

- Individuals were supportive of habitat restoration where suitable, recognising the importance of habitats, and had positive views on restoration of neglected habitats.

More information/detail required on the proposals

- SUMMARY - 6 organisations (4 farming focused, 2 environment focused), campaign response A, and 6 individuals sought more detail on the proposals. Further detail from responses is summarised below.

- Two farming focused organisations stated concerns that, while work on profiling the NI site network to inform the most appropriate mitigation approaches for sites is incomplete, DAERA are proposing targeted measures at all internationally designated sites without knowing which sites would benefit from this approach.

- A farming focused organisation stated the concern that there is a lack of ecological monitoring, research etc, to provide a baseline to measure progress.

- A farming focused organisation stated that the plans are vague, and any measures should be evidence based.

- An environment focused organisation broadly welcome the proposed vehicles for delivery that have been outlined in the strategy, however they state that it is difficult to assess how effective they are likely to be when there has been little detail published on when these schemes will become fully operational under a future agriculture policy framework, the proposed ambition for uptake, and the total budget which will be allocated to them.

- An environment focused organisation recommend DAERA publish a comprehensive action plan for delivery and evaluation of the final Ammonia Strategy and the 2030 targets, and the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy. They welcome the commitment on page 10 of the draft Ammonia Strategy to ‘Provide appropriate financial support for the implementation of ammonia reduction measures on farms through the Green Growth capital investment plan and

relevant Future Agricultural Policy Programme Measures'. Limited details are provided on these delivery and funding mechanisms, and the risks and barriers associated with delivery. Detail is required, especially on the cost-effectiveness of the actions and investments needed and how these will align with the timing and structure of the proposed Farming for Nature Scheme, for example. Until funding is secured and clarified, significant uncertainty will remain around the final Ammonia Strategy's future implementation. This will impact negatively on stakeholder confidence and their willingness to act to address ammonia issues. The draft Ammonia Strategy does not provide sufficient clarity on the additional resources and budget to deliver the advisory support and training necessary to achieve the uptake rates on which the agricultural emissions target depends. They envision that incentive schemes for farmers could play a significant role in stimulating and front loading the behaviour changes necessary for success. Equally, consumers and the wider agri-food industry have a role to play in the response.

- Campaign response A stated that as this work remains ongoing DAERA should explain why they are proposing targeted measures at designated sites in the absence of complete research. In addition, given that designated sites extend to the south what engagement and collaboration is taking place in the south. They also stated that this needs new funding from Government and needs to be done in partnership with farmers.

- Individuals made comments including: the proposals and unclear and vague, there is no baseline; ongoing work is incomplete; and the impact on farm businesses must be considered and redressed.

Funding information sought or suggestions made

- SUMMARY - 10 organisations (5 environment focused, 4 farming focused, 1 water focused) and 132 individuals sought information on funding or made suggestions about funding. Further detail from responses is summarised below.

- An environment focused organisation agrees with proposals to support landowners and the necessary conservation actions to restore habitats and feel that further resource needs to be allocated to training on habitat restoration advice.

- An environment focused organisation stated that protection and restoration of habitats should be a key driver of all funding proposals. The proposals are too vague and untargeted; as they stand, they are unlikely to be able to deliver on the required scale of changes in management of land. The Environment Strategy and upcoming Biodiversity Strategy need to provide much greater specificity and detail on actions, and they should be integrated into this Strategy when available. Current suggestions are not 'SMART' or inclusive of monitoring and reporting targets, so unlikely to be effective.

- An environment focused organisation stated that the strategy offers little detail on delivery or funding mechanisms and as result they are concerned the proposals will not deliver needed habitat restoration and measures to significantly reduce the damaging effects of ammonia. The urgency and severity of the ammonia challenge, as well as the wider nature and climate crises, underpin the need for an ambitious and far-reaching Farming with Nature package within Future Agricultural Policy (FAP) to be adequately resourced from the

outset and made as attractive as possible for farmers to participate in, recognising the public good they are delivering. Peace Plus funding will also be essential to enable a sustained approach to large-scale peatland restoration projects which could not be resourced through agri-environment scheme payments. They are also very concerned about the lack of a monitoring framework to determine if measures, many of which remain voluntary, are being effective and if not, what corrective action would be taken.

- An environment focused organisation stated that DAERA needs to demonstrate leadership in this area and drive this agenda forward. Securing sufficient long-term funding will be necessary.

- A farming focused organisation stated that the farmers in question own the land, therefore, if the Department is going to dictate what is to happen on a certain area of land, government must pay accordingly annually by agreement with the farmer in question suitable support money inflation linked.

- A farming focused organisation and 15 individuals stated that, providing everyone has bought into the need for change, a written agreement must cover all expectations from the farmer, NIEA and DAERA and should cover but not be limited to: work practices required; any capital spend which has a scientific justification; ammonia reductions agreed; and funding available to the farmer for capital spend. Consideration is also needed of lost farm income.

- A farming focused organisation are supportive of the desire to provide financial and technical support to landowners and to fund research; the prerequisite for effective change will be adequate funding.

- A farming focused organisation stated that farmers must be supported with both information and funding if targets are to be met. Farmers must be part of the habitat restoration discussion and planning stage. Environmental schemes must be longer in duration than 5 years and must have at a minimum inflation linked review points. The evidence base must be sufficient before measures which hamper farming practices are enforced in any location.

- A water focused organisation are supportive of the use of funding streams such as Peace Plus to restore unfavourable habitats although longer term monitoring should be provided after the cessation of these funding streams. In addition, strong financial support should be available to encourage landowners to restore protected habitats. In the INTERREG VA Source to Tap project farmers would not avail of peatland restoration measures which were 100% funded as they would have lost farm subsidies and so farmers must not be penalised in the long term for restoring peatlands rather than draining and using them for farmland.

- Eleven individuals stated that new funding is needed, and that work needs to be done in partnership with farmers.

- Fifty-six individuals stated that funding will be required for restoration of these areas and asked who would be responsible for any loss in farm income.

Not supportive

- Four individuals were not supportive of habitat restoration programmes.

No comment

- Three organisations (2 Councils, 1 farming focused) and 7 individuals had no comment to make in relation to the question.

Question 19 - Do you have any comments on what evidence or issues should be considered when assessing these impacts?

- In total there were 286 responses to this question, of which 23 were from organisations, 119 were from individuals, and 144 were from campaign response A.

- Answers were assigned to six separate categories following consideration. The number of responses in each category is set out in Table 19 followed by summaries of the responses.

Table 19. Number of responses to question 19 by category

Category	Number of organisations	Number of individuals	Campaign response A
Need for clear assessment processes	4	73	
Further considerations raised	14	15	
Concerns about impact assessments	3	11	144
Funding needed	1	7	
Not supportive		2	
No comment	1	12	

Need for a clear assessment processes

- SUMMARY - 4 organisations (2 environment focused, 2 farming focused) and 73 individuals responded with concerns including the need for a clear assessment process.

- An environment focused organisation suggested that all other jurisdictions on these islands be reviewed to identify the best practice examples and adopt them.

- An environment focused organisation stated that new agri-environment measures should be developed on a partnership basis, involving the landowner at all stages to deliver a bespoke, outcomes-based scheme with targets set around ammonia reduction and habitat restoration. The potential contribution of wet woodland creation on peat soils should be considered as this land use change could make a significant contribution to both ammonia and carbon reduction strategies.

- A farming focused organisation and 30 individuals stated that impact assessment (in particular ecology) can be very subjective depending on the interpretation and views of the ecologist compiling the report. They suggest that clear scoring criteria is made available from the outset and that several independent viewpoints must be considered in drafting a final report for any location.

- A farming focused organisation stated the need to ensure up to date research is available on which to base policy actions. Farm impact assessments (in particular ecology) should be based on a scoring system that is measurable and delivers proportionate recommendations, that moves us away from the sometimes subjective interpretations that currently have to be made by the ecologist compiling the report.

- Twenty individuals stated the need for clear scoring criteria, with many also stating that several independent viewpoints must be considered in drafting a final report for any location.

- Eleven individuals stated the need for independent viewpoints to be considered and independent review of processes.

- Individuals also stated the need for farming representatives to be involved, for farmers' views to be listened to, and the need for a mechanism for appeal or arbitration.

Further considerations raised

- SUMMARY - 14 organisations (6 farming focused, 4 environment focused, 3 Councils, 1 water focused) and 15 individuals raised further considerations. Further detail from responses is summarised below.

- A farming focused organisation stated that no targets or policies should be set without appropriate levels of research and evidence.

- A farming focused organisation stated that a detailed cost/benefit analysis is essential; the impact on productivity should be assessed; the potential for unintended consequences needs to be considered and assessed; and a holistic emissions approach should be taken, and not just a focus on ammonia in isolation.

- A farming focused organisation noted negative experiences with officials in the past and concerns that much of the baseline work on habitats and ammonia modelling has yet to start or is not completed and it is unacceptable to impose measures before this work is done.

- A farming focused organisation stated that policy needs to be streamlined into a more coherent format so that the overall 'sweet spot' be attained in the wider interests of NI. They stated the need to stop chasing single issues and view everything in its entirety. Small family farms, particularly in more marginal areas, must not become sacrificial lambs in a trade-off for highly intensive production. The social, environmental and production value of smaller holdings need to be recognised in policy decisions. Cost benefit analysis should be carried out on all proposals which also consider the potential for unintended consequences, of which there are many in these proposals.

- A farming focused organisation that grain importers need to play a part by reducing imports, paying to solve the problems, or transporting surplus manure back to Brazil etc when ships are returning to reload.

- A farming focused organisation have concerns regarding the ambitious timeline of the strategy and the challenges posed for the supply chain and infrastructure.

- An environment focused organisation recommend that the ammonia strategy encourages and supports farmers to plant and restore hedgerows on their land to encourage longer grazing seasons and ask that the 40% ammonia reduction target and measures include ancient woodland sites.

- An environment focused organisation noted that the role of KPIs in monitoring, characterising and impact assessment will be challenging for DAERA, however considerable expertise already exists in some institutions and organisations, and they suggest working closely with experts to address both international/UK and NI metrics in a co-ordinated and efficient way.

- An environment focused organisation noted the draft strategy discusses human health implications of ammonia emissions but there appears to be no broader health assessment for agricultural developments.

- An environment focused organisation recommends that DAERA publish the full evidence base and underlying assumptions used in the development of the draft Ammonia Strategy.

- A Council understands the draft strategy will be subject to a Habitats Regulations Assessment.

- A Council stated evidence needs to be site specific and via ammonia sampling at the relevant designated sites or lands within their vicinity. Evidence presented needs to be robust and verifiable and cannot entirely be based on methodologies for the technologies or measures implemented.

- A Council stated that a number of assessment processes examining the impact on the environment, habitats, equality, and rural needs have been provided with the consultation document. It is acknowledged that the evidence base for these assessments will draw significantly on the detailed environmental and economic analysis already highlighted. The Council wish to highlight that DAERA should ensure that environmental and economic analysis provided is factual.

- Individuals made comments including: the need for baseline figures to be accurate; the need for common sense; consideration of impacts at all levels; the need for robust, verifiable evidence, and that viewpoints should be considered.

Concerns regarding impact assessments

- SUMMARY - 3 organisations (2 farming focused, 1 environment focused), campaign response A, and 11 individuals had concerns regarding specific impact assessments. Further detail from responses is summarised below.

- A farming focused organisation is concerned that the Regulatory Impact Assessment (RIA) is outdated, inaccurate, and does not include the spatially targeted measures. The fact that

the RIA is based on MACC curves that were presented publicly to the industry in September 2020 is worrying as there have been significant price rises to all the major farming inputs and to equipment and machinery. This does not accurately reflect the true costs and benefits of the policy measures proposed and cannot be accepted as a suitable RIA for this policy. The RIA contains no information on the impact of spatially targeted measures. A full EQIA will be required for the spatially targeted measures. As the Rural Needs Assessment refers to the flawed RIA, this will also need to be revisited with new and relevant economic information. The targeted approach has the potential to hit some of the most deprived rural areas the hardest and therefore needs to be reviewed.

- A farming focused organisation are concerned that the Regulatory Impact Assessment (RIA) is outdated, inaccurate and does not include the spatially targeted measures.

- An environment focused organisation stated that the SEA and HRA need to be taken forward urgently. The impact of ammonia on human health as well as on the natural environment needs to be fully considered as this will provide further rationale for more concerted action. Studies carried out by Teagasc on the effect of ammonia on general public health have shown that the potential direct impact of NH3 on is under-represented in scientific literature, though there have been several studies which indicate that NH3 has a direct effect on the respiratory health of those who handle livestock.

- Four individuals stated the need for a Rural Impact Assessment detailing the specific social and economic impacts on farmers and rural communities in Less Favoured Areas (LFA's).

- Campaign response A and 4 individuals stated the need for a Section 75 impact assessment, stating that, as the department have defined a significant impact which suggests the department has evidence, where is the evidence?

- Two individuals stated that the RIA is out of date.

Funding needed

- SUMMARY – a farming focused organisation and seven individuals stated the need for funding.

- The farming focused organisation stated that it would be useful to understand the scale of the budget DAERA are hoping to put to delivering this strategy and how that budget will be used to support the agri-industry.

- Five individuals stated that new funding is needed from Government and this needs to be done in partnership with farmers.

- An individual asked, for existing 'Habitats' which are so valuable and currently maintained by farmers, is there a 'Public Good' and a proper publicly funded measure to enhance and maintain them.

Not supportive

- Two individuals were not supportive; one stated that land is for food production, and this should be maximised and supported; and another stated that this was a waste of farmers time and energy.

No comment

- One Council and 12 individuals had no comment to make in relation to the question.

Question 20 - What are your views on how DAERA should work with stakeholders to inform the direction and delivery of the strategy, and the detail of the various measures?

- In total there were 299 responses to this question, of which 25 were from organisations, 130 were from individuals, and 144 were from campaign response A.

- Answers were assigned to five separate categories following consideration. The number of responses in each category is set out in Table 20 followed by summaries of the responses.

Table 20. Number of responses to question 20 by category

Category	Number of organisations	Number of individuals	Campaign response A
Supportive of stakeholder engagement	18	99	
Feedback provided on stakeholder engagement	5	12	
EQIA concerns stated		9	144
Other suggestions made	1	4	
No comment	1	6	

Supportive of stakeholder engagement

- SUMMARY - 18 organisations (9 farming focused, 4 environment focused, 3 Councils, 1 water focused, 1 rural focused) and 99 individuals were supportive of stakeholder engagement. Further detail from responses is summarised below.

- A farming focused organisation stated that any stakeholder group should have influence and not simply be seen as a talking shop, and there should be an industry supply chain stakeholder group.

- A farming focused organisation stated that DAERA must work with stakeholders to deliver a genuine partnership approach.

- A farming focused organisation stated it is essential that all stakeholders are given the option to be part of the decision-making process which will agree any changes implemented as a result of this consultation. No meetings should be in isolation and all relevant stakeholders should be involved in quarterly reviews as these changes begin to be enforced.

- A farming focused organisation stated it is essential that stakeholders should be seen as partners who, when from a farming background, have all the necessary insights and experience to determine what is sensible and practical. Agreeing best practice mitigations, appropriate and acceptable measurement metrics and support packages are key for delivering a successful outcome.

- A farming focused organisation stated that a partnership approach is essential, and a working stakeholder group is a good idea in the attainment of this.

- A farming focused organisation hold the view that the delivery of the Strategy will require ongoing discussion and cooperation among the farming, agricultural trade, and policy maker stakeholders in Northern Ireland and suggest that stakeholder consultation and communications aspects of the Strategy will be key to its success.

- A farming focused organisation stated that partnership and collaboration will be vital to tackling the issue of ammonia and cited the Greenhouse Gas Implementation Partnership as an excellent example of how industry and government collaboration worked to deliver successful initiatives and drive real behavioural change at farm level.

- A farming focused organisation think there is a need to deal with ammonia emissions from agriculture and that better promoted information nights are beneficial to educate industry and farmers.

- A farming focused organisation stated that there needs to be genuine long-term partnerships with stakeholders, not just during consultations. Farmers have been on the land for generations and know what will work and not work on their land. The importance and use of local knowledge and experience is vital.

- An environment focused organisation suggested fully collaborative co-design of the final programmes taking into account the views of the wider community and knowledgeable experts outside of the farming community itself.

- An environment focused organisation stated that partnership working is very much at the heart of how it carries out its conservation work and welcome the opportunity to inform the direction and delivery of the strategy, and the detail of the various measures. The success of their outreach work is down to all parties playing an active role in the development of nature-based solutions that align with each farmers own unique circumstances. It is vital that partnership delivery models are not too prescriptive, and that farmers and landowners are treated as partners in the delivery of projects and not simply delivery agents for measures that they have had little involvement in developing.

- An environment focused organisation stated that the Department should be willing to adopt a partnership approach and should consider the model of the EFS Group strategy. The outcomes of the training need to implement the Ammonia strategy and should not be assessed as merely a tick-box exercise. The adoption of an integrated solution focus should be made clear and stressed by the Department in its delivery of the Strategy.

- An environment focused organisation stated that ammonia pollution is a cross-cutting policy requiring an equally holistic response and encourage DAERA to ensure other departments are included in this process so that it links to health priorities, avails of necessary financial support, and aligns with other current policy areas and legislative and international commitments. The holistic nature of this issue and the strategy's approach will also require multi-stakeholder engagement with environmental NGOs, academics, industry, and the public.

- A Council agrees the establishment of a stakeholder group including representatives from primary agriculture, the agri-food supply chain, and the environmental sector will be required to advise on the implementation of the Ammonia Strategy.

- A Council stated that education along with incentives will be required to raise awareness of the effects of ammonia on the environment and the importance of its reduction. This should extend beyond the agricultural sector to include the public (including Further and Higher Education e.g. CAFRE and South-West College) and business (e.g. agrifood) sectors. The Council believes that communication/engagement with stakeholders could be improved to raise awareness and levels of engagement. A genuine partnership approach is needed.

- A Council are of the opinion that representatives from as many stakeholders as possible are included to advise on the implementation of the Ammonia Strategy, this should include public sector, like the planning department for example.

- A rural focused organisation stated that other stakeholders who should be involved include planning officials from Department of Infrastructure and local Councils and environmental sector with specific expertise in ammonia pollution. It may also be useful to include mechanisms for consultation with stakeholders across the Border as several river systems are cross border in nature.

- A water focused organisation support the approach being adopted but ask that the stakeholder group is a diagonal size representing all farm sectors and farm sizes and not limited to larger units.

- Fifty-six individuals stated that all relevant stakeholders should be involved and given the option to be part of the decision-making process which will agree any changes implemented as a result of this consultation.

- Six individuals stated that DAERA should work with farmers in partnership.

Feedback provided on stakeholder engagement

- SUMMARY - 5 organisations (3 farmer focused, 2 environment focused) and 12 individuals had concerns provided feedback on stakeholder engagement. Further detail from responses is summarised below.

- A farming focused organisation accepts that there is a need to deal with ammonia emissions and believe that, while extremely challenging, with a long-term approach the

industry can work together with other key players to successfully deal with ammonia. This will need a genuine partnership approach where all parties are committed to supporting a sustainable agriculture industry while reducing ammonia emissions. They are supportive of DAERA working with stakeholders but note previous disillusionment and ask that previous concerns are taken into account.

- A farming focused organisation stated that they are seldom included as stakeholders and a good place to start would be to hear from all stakeholders when plans are being set and not after the event.

- An environment focused organisation stated that ongoing engagement with all stakeholders is essential. In addition to primary agriculture, the agri-food supply chain and the environmental sector, the stakeholder group should also include relevant academics or research institutes and planners. It would also be beneficial to include those with expertise in social science, given that much of the success of implementation will hinge on supporting transition and adapting to change.

- An environment focused organisation notes the consultation document states: ‘A stakeholder group including representatives from primary agriculture, the agri-food supply chain and the environmental sector will be established to advise on the implementation of the Ammonia Strategy’. They suggest the placing of the representatives in this order (1) agriculture, (2) agri-food supply chain, (3) environment, implies a hierarchy not reflected by the statutory drivers for action such as wider public interest in human health, biodiversity and other public goods threatened by ammonia pollution as well as the significant international and national commitments at risk if no action is taken.

- An individual stated the need for DAERA to work with farmers and get farmers on side to reduce ammonia emissions as they own the land.

- An individual stated the requirement for genuine partnership from all stakeholders for delivery of all relative strategies, and that partners have to believe their opinions are respected.

- An individual stated the need to work more with farmers and less with lobby groups/politicians/environmentalists.

- An individual noted further sources of input: Citizen Science projects such as CeDAR; contribution by "friends of" groups that for example help to maintain the Belfast and Strangford Lough coastline; and sharing knowledge to inform local council development, biodiversity plans and tourism generation programmes.

- An individual stated the need for engaging meetings that are a 2-way discussion and not information evenings where DAERA give advice and do not record any suggestions that come from the floor.

- An individual stated that Government should be working off a 'White Paper' policy document which clearly articulated the 'food security' / financial security / habitat security of N. Ireland / UK.

- Other comments from individuals included: the need for meaningful dialogue in public meetings; that a more nuanced approach be taken, and that consultations are a PR exercise.

EQIA concerns stated

- Campaign response A and 9 individuals stated that DAERA should act in partnership with farmers. Equality Commission in their advice to public authorities encourage 'Early, ongoing and meaningful engagement with those directly affected by a proposed policy'. It is clear from DAERA's assessment this has not happened. The equality screening process has not been exercised 'in substance, with vigour and open mind' in line with Baker Brown Case law.

Other suggestions made

- One environment focused organisation and 4 individuals made other suggestions in relation to stakeholder engagement.
- An environment focused organisation recommend that DAERA publishes a comprehensive action plan for the delivery and evaluation of the final Ammonia Strategy and the 2030 targets. They recommend the final Ammonia Strategy sets out a long-term roadmap for achieving the 2050 emissions target, considering a wider range of drivers and pressures. They strongly recommend that the final Ammonia Strategy includes a monitoring and evaluation framework to ensure that lessons learned inform and increase the likelihood of successful delivery for 2050. This will have the added benefit of enabling the Government to acknowledge and highlight best practice on farms across Northern Ireland. They welcome that the draft Ammonia Strategy sets out review points in 2025 and 2028 but there is no scope or methodology provided for these reviews. The assessment methodology to measure and report progress in achieving the objectives of the final Ammonia Strategy should be evidence-based, accessible, consistent, and transparent.
  There is a lack of clarity on what will be assessed and by who, how the different evaluations of progress will combine, and what will be done by DAERA or other delivery partners if sufficient progress is not being made towards the targets. A clear plan for monitoring, assessing, and reporting, allows key barriers, trends and interventions to be identified and accounted for during the implementation of the final Ammonia Strategy. A monitoring and evaluation framework could be detailed in a comprehensive action plan alongside the final Ammonia Strategy.

- An individual stated that this will need to be done on an individual farm basis with a plan drawn up with sensible and achievable targets set with appropriate funding put in place where necessary. If the bar is set to high, then failure is much more likely to be the result. Any steps in the right direction should be seen in a positive light as it all adds up in the long run.

- An individual noted that some stakeholders will have objectives that are not in line with maximising quality food production.

- An individual stated that there should be a further consultation after replies have been considered.

- An individual stated that it should be on a voluntary basis.

No comment

- A Council and 6 individuals had no comment to make in relation to the question.

Question 21 - Do you have any other comments or contributions on this document?

- In total there were 517 responses to this question, of which 31 were from organisations, 171 were from individuals, 144 were from campaign response A, and 171 were from campaign response B.

- Answers were assigned to six separate categories following consideration. The number of responses in each category is set out in Table 21 followed by summaries of the responses.

Table 21. Number of responses to question 21 by category

Category	Number of organisations	Number of individuals	Campaign response A	Campaign response B
Strategy should go further	2	1		171
Supportive of the strategy		3		
Further information sought or suggestions made	28	143	144	
Concerns about food security		7		
Not supportive		9		
No comment	1	8		

Strategy should go further

- SUMMARY - 2 organisations (1 environmental, 1 political) campaign response B and 1 individual responded that the strategy should go further. Further detail from responses is summarised below.

- An environment focused organisation stated that this is an urgent issue with current negative impacts on both natural habitats and human health and that that this document does not, in their view, sufficiently address the scale of the problem of continuing ammonia emissions coupled with continued damage from those. They sought a more radical and urgent approach to reducing emissions is required to halt and ultimately reverse the damage that is being done to habitats in NI.

- A political party/representative stated that we are rapidly running out of time to meet 2030 targets and properly address the real dangers to our environment. They said that, while DAERA's publication of this strategy is to be welcomed, they are disappointed that scope seems limited and unwilling to enforce greater policy change on this serious issue and that is likely the department will receive criticism from environmental bodies on this, as the action proposed arguably severely lacks the urgency required to address emissions with enough effect.

- Campaign response B stated that ammonia damages our most precious places, pollutes air, water, and soil, and is a risk to people's health. DAERA's proposed strategy isn't good enough and will do little to solve the ammonia crisis. Its measures are weak and voluntary and will only reduce ammonia emissions by about 25%. If carried out, only two of our most protected sites are projected to recover. Much stronger action is needed. The draft strategy should be rewritten with stronger proposals, followed by a consultation that's run in a more open and transparent way. They would like to see the following included:
  1. The government has tried persuading and coaxing farmers to become more sustainable. It hasn't worked. Tackling the ammonia crisis should not be left to voluntary measures, education and gentle persuasion. Instead, the proposed actions should be mandatory. Strong enforcement measures should also be included.
  2.Ammonia emissions can travel hundreds of miles before polluting the land where they settle. This means pollution from farms here can impact the environment in distant places, where people have no say in what happens in Northern Ireland. Given the impacts Northern Ireland's ammonia emissions may have in other jurisdictions, the consultation should include statutory bodies, Non-governmental Organisations (NGOs) and communities in the Republic of Ireland and in Great Britain.
  3. Farm animals are the single biggest contributor to the ammonia crisis. We need to shift from factory farms to regenerative farming, but no consideration is being given to freezing or reducing livestock numbers. There should be a ban on all new industrial farms to prevent an increase in farm animals.
  4. Not only are farm animals the cause of the ammonia crisis, but their associated carbon emissions are also a major contributor to climate breakdown. Farms must move away from their reliance on farmed animals. The transition to more sustainable farming must be just, however. Farmers should be given financial support and training so they can reduce the number of animals they manage and diversify into farming that is better for the environment and better for rural communities.
  5. Farm developments are often broken up into smaller parts in order to avoid triggering more stringent assessments. This salami slicing must be banned, and more rigorous cumulative assessments carried out. A Strategic Environmental Assessment of ammonia-emitting developments should be introduced.
  They asked that their objections be taken into consideration and the changes made to create a new Ammonia Strategy that's fit for purpose and has wide support.

- An individual stated that while there are some worthwhile proposals in the strategy, particularly in relation to ammonia reduction, they felt overall that the strategy suffers from a number of weaknesses, in that it does not recognise the full extent of the effects of ammonia pollution and fails to address even those that it does recognise (i.e. on SACs, SPAs and Ramsar sites). These appear to stem from an unrealistic stipulation that overall livestock production should be at least maintained at current levels. As a result, the potential for rebalancing agriculture production onto a more sustainable footing is forgone, and it is highly unlikely that the measures proposed would do much more than scratch the surface of the ammonia pollution problem.

Supportive of the strategy

- SUMMARY - three individuals were supportive of the measures to reduce ammonia emissions. Further detail from responses is summarised below.

- An individual said that they were behind the 30% figure.

- An individual said it is good to see something is being done to reduce ammonia levels for the long term good of our planet.

- An individual said it is an excellent and well put together document, and good for farmers to be able to have their say on it.

Further information sought or suggestions made

- SUMMARY - 28 organisations (11 farming focused, 7 environment focused, 3 Councils, 2 planning focused, 2 AD focused, 1 political party/ representative, 1 water focused, 1 rural focused), campaign response A, and 143 individuals cited a range of concerns relating to more detail required on the proposed measures and targets. Further detail from responses is summarised below.

- A farming focused organisation stated that it would be helpful to have more detail of the research that's driving this strategy, that transparency is essential, as is the need to demonstrate on what grounds the strategy is based. They also said there should be clarity on how this policy will affect planning applications; that it is essential that planning does not become an impediment to investment to either improve efficiency and productivity, or to grow a dairy farming business.

- A farming focused organisation recognise that that a 'Call for Evidence' is planned on the NIEA Operational Protocol, and that this will be challenging but engagement is needed. Concerns were expressed around the current approach to planning in relation to ammonia emissions on farms, and a lack of clear advice and guidance for those farmers considering changing or updating their farm businesses. As part of their commitment to maintaining high environmental and animal health and welfare standards on NI farms, investment in modern buildings and infrastructure to reduce the environmental footprint will have a huge role to play. They urged that 'betterment' is permitted to deliver environmental and production improvements on existing farms.

- A farming focused organisation responded that climate change is not being taken seriously enough around the world by far and family farmers in Northern Ireland can deliver their part providing they are treated with respect; that they need Government support and proper returns for their produce which can only be delivered by the Northern Ireland Farm Welfare Bill.

- Two farming focused organisations did not disagree that ammonia emissions must be controlled and reduced within NI with some agri industries being in a 'better place' than others regarding ammonia mitigation and control. They noted frustrations and lack of decision making for many existing farms occurs as they don't fully understand the further restrictions to be enforced upon individual farms due to changes to the Operational Protocol and the Kunming-Montreal Global Biodiversity Framework. They sought clarity and help to support farming businesses to become more in tune with the environment while continuing to create incomes for farming families.

- A farming focused organisation stated that the document is vague in a number of areas (base line, the land mass considered within the lifetime of the strategy for 40% reduction and whether a further strategy once again raising the bar will follow this one), and also fails to recognise key enablers to delivery (AD plants) nor recognises explicitly the need to develop accurate measures of emissions and to show appropriate linkages with Green

Growth that could help distil policy actions down to those that are the best fit across all areas of environmental improvement.

- A farming focused organisation stated that financial support incentives in the form of grants and direct support has worked well as an enabler to change in the farming business and there needs to be an approach that allows business to change at a pace that is sustainable. As farmers are bombarded with such an array of policy changes, processor demands and changing consumer attitudes it is essential that DAERA and NIEA are sympathetic to the changes that many of these businesses and business owners are being forced to make and the new skills that need to be developed, that the changes are fair and reasonable and based on robustly researched evidence.

- A farming focused organisation stated their wish to have the opportunity to participate in the further development and implementation of this Strategy.

- Three farming focused organisations stated concerns related to meetings on the consultation being poorly publicised and that it is essential that stakeholder voices are heard.

- A farming focused organisation welcomed inclusion in the stakeholder group.

- An environment focused organisation was disappointed that the Strategic Environmental Assessment and Habitat Regulations Assessment were only at the screening stage. They stated that the HRA in-combination assessment essentially assessed itself. They noted no reference/acknowledgement within the HRA to the consideration of transboundary issues, and in particular cross border protected areas, or other protected areas which are linked in some way e.g. hydrologically.

- An environment focused organisation stated that the document needs to be more clearly linked to climate change policy, noting that statutory commitments to reach targets are being put at risk by the damage being done to peatlands that could sequester carbon if they were not being damaged by ammonia pollution. They also stated that, while the strategy recognises the importance of livestock production to the economy of NI, it should also consider links to food policy e.g. the need to encourage the public to eat a more balanced, healthy diet.

- An environment focused organisation recommend DAERA publishes an updated Operational Protocol for assessing air quality impacts without further delay, recommending that the final Ammonia Strategy's links with, and impacts on, other major policies and commitments, both national and international are clearly mapped. They stated that understanding environmental states, drivers and pressures is vital for the development of an evidence-based strategy and enables the prioritisation and targeting of measures to deliver environmental improvement. Significant overlap was noted between what the Code of Good Agricultural Practice for the Reduction of Ammonia Emissions and Nutrient Action Plan and the proposed measures outlined in Chapter Four; while coherence is welcome and increases the likelihood of adoption, progress required to meet the targets can only be achieved by going beyond current agricultural practices and technology. Other pathways to reduce emissions are worth considering such as alternative scenarios for agricultural systems and land use change, such as 'Site Nitrogen Action Plans' developed with site managers/stakeholders and implemented, for example, by agri-environment schemes, to minimise effects from local sources of atmospheric nitrogen on designated sites as

recommended by the DAERA EMIND (Evaluating and mitigating impacts of N deposition to Natura 2000 sites in Northern Ireland Project).

- An environment focused organisation welcomed proposed targets to tackle ammonia emissions by 2030 so long as they are acted upon fast, are well-funded and well-resourced, hoping to see leadership to turn this strategy into action quickly. Targets should be met with ambitious action, such as more specific remedial and holistic approaches for farming policy and nature restoration. Pillar One: Ammonia Reduction Programme Reduction measures. They welcome proposed measures to reduce ammonia, such as low emission slurry spreading equipment and low emission livestock housing, however, like many of technological-focused proposals from the Future Agricultural Policy, these measures will only achieve small reductions in emissions, “chipping away at the margins” without addressing the root cause of the problems of large-scale unsustainable and intensive livestock systems which overgraze land, compact soils and utilise high levels of urea fertiliser and slurry. Tackling this much larger issue will require a transition to more regenerative farming practices to improve soil health and farm productivity, which can only be achieved through a cross-cutting policy approach to agricultural reform. required ongoing maintenance.

- An environment focused organisation stated that with trees recognised as playing a key role in addressing ammonia emissions, this will inevitably lead to increased demand for trees and hedgerow plants across Northern Ireland. They recommend that DAERA support local tree nurseries through a Tree Production Innovation Fund and a Tree Production Capital Grant, this support is currently available from the Forestry Commission to increase the quantity, quality, diversity and biosecurity of tree, seed, and sapling supply in England. They welcomed the opportunity to further develop this work with DAERA to ensure that the tree planting required to reduce the impact of ammonia emissions in Northern Ireland is done using locally sourced and grown trees that will reduce biosecurity risks whilst supporting tree growth.

- An environment focused organisation welcomed the strategy and look forward to continuing to engage with DAERA and all stakeholders on how best to tackle an issue which has a direct impact on nationally and internationally important sites in our care, and all other sensitive sites across Northern Ireland.

- An environment focused organisation noted the public health implications of ammonia, stating that across Northern Ireland as a whole, it has been projected (British Heart Foundation) that poor air quality leads to 500 premature deaths each year. They are concerned that if the measures proposed in this strategy are proving to be insufficient to meet the reduction target, are there other Department plans to enforce the regulations more rigorously? They feel that the public health implications of atmospheric ammonia have not been sufficiently publicised and when they are, there will be significant pressure on the farming community and the Department to adopt a much more rigorous and enforceable strategy.

- A Council stated that extant permitted development (PD) rights enable unassessed ammonia related development and DAERA has not considered or quantified how unassessed Permitted Development (PD) may impact its ammonia reduction strategy.

- A Council acknowledges that this consultation on the draft Ammonia Strategy is a first of its

kind for Northern Ireland and is to be welcomed. They encourage such engagement in the future as it is only by a collaborative approach that we can achieve the right pathway to improvement.

- A Council stated concerns regarding the limitations of the Rural Needs Impact Assessment undertaken which has failed to consider associated impacts in relation to poverty or deprivation in rural areas. DAERA has failed to provide any clarity on the specific social and economic impacts of the proposals on farmers in Less Favoured Areas (LFAs) and the Council calls on DAERA to undertake an economic impact assessment and equality impact assessment of the proposals to ascertain the impacts, particularly on cattle and sheep farmers in LFAs.

- A planning focused organisation stated stress the need for specific manufacturers of any proposed technologies to provide manufacturer specific test results for the performance of their relevant item. The current information that exists seem to be a very general with the 'potential to reduce' rather than what specifically does it reduce ammonia by and does it operate in a safe manner. In respect of technologies that involve the inserting of valves into cattle slats and any form of 'sealing over' tanks they highlight the potential for creating a methane bomb under the building. Also if slats are closed over or sealed tanks encouraged then during mixing of the tank all toxic gases will presumably exit the tank at the mixing point where the operator is standing which sounds like a health & safety issue.

- A planning focused organisation stated that the aims are a reduction in ammonia levels across NI; the principal issue is unregulated development in dairy beef sector and the lack of adoption of new and emerging technologies.
  The outcomes are: reduction in ammonia; improvement in habitat; restoration of habitat; improved land stewardship; ore control on development which impacts on environment; protection & development of rural economy.
  They made 9 proposals in their response:
  1. Removal of PD rights from agriculture. All applications for farm development regardless of size should be subject to planning permission.
  2. Whole farm assessments as part of the planning process.
  3. Permitting for all farms within 3 km of sensitive habitats.
  4. Creation of new habitat There are numerous schemes for land stewardship and preservation of habitat. While this is laudable – it merely crystallises the existing situation. Applicants for farm development should be encouraged to undertake habitat creation as part of any application. Not only protecting habitat but setting aside areas within the farm to allow habitat to be established and naturalised.
  5. Establishing acceptable limits on sensitive sites.
  6. Planning and environmental gains currently under planning policy.
  7. Sustainable litter disposal and negative conditions.
  8. Meaningful engagement with agriculture sector by Shared Environmental Services (SES) and DAERA.
  9. New technology - there needs to be an awareness of the benefits of new technology which is used in other UK & European jurisdictions.

- An AD focused organisation support targets to mitigate ammonia emissions produced by the AD industry and the wider agricultural sector. While digestate use makes up a small proportion of agricultural ammonia emissions in Northern Ireland (4%), it is still crucial that the sector continues to mitigate and avoid emissions of ammonia if Northern Ireland is to meet its 30% reduction target by 2030. However, factors such as feedstock, digestate composition, business model, plant size, location and capacity all impact the way in which

digestates need to be managed. So, the targets should not specify exactly how digestate should be managed as blanket approaches mean that farms and AD operators may not be able to adopt a more suitable, cost-competitive approach to mitigating ammonia emissions. Furthermore, it is imperative that the ammonia reduction targets are supported by an appropriate regulatory framework that facilitates innovation rather than being prescriptive.

- A political party/representative stated their support of logical, practical, and well thought out policies and, where necessary, legislation that will help support farmers to reduce ammonia emissions where necessary. However, they highlighted some fundamental issues with some proposals under pillar one and Pillar two. A rural impact assessment examining the social and economic impacts of these measures on farmers in Less Favoured Areas is needed and would better inform what proposed measures are workable and what is not workable. Policy development must respect equality obligations this must be a central to the development of an Ammonia strategy. They were concerned that the lack of any kind of all-Ireland dimension to the policy will make it less effective overall and unworkable in some border regions. They were also deeply concerned about the effect having no Minister, budget or agricultural policy is having on both the strategy itself and the timetable for delivery.

- A water focused organisation stated that they have water quality data which show large ‘plugs’ of ammonia frequently being released into rivers, which sometimes take up to 18 hours to pass. During these events water abstraction and treatment has to cease in order to protect the drinking water supplies. This frequently happens during the closed slurry spreading season. This strategy should also address this issue, which is likely to be widespread across NI, showing a route map and actions to prevent and discourage this type of activity which is a significant threat to drinking water supply. They also are aware that many farmers lease ‘paper acres’ so that they meet the required livestock densities for slurry spreading. In many cases the slurry is not spread on the leased land at all, it simply enables an unacceptable volume of slurry to be spread in a smaller area of land well above the desired volumes. This is likely to cause runoff to watercourses. This system needs to be improved and this should be addressed in this strategy document.

- A rural focused organisation is concerned about the potential impact of air borne ammonia pollution on human health. Northern Ireland's dispersed settlement pattern means we have a significant proportion of our population who are living in open countryside and are exposed to high levels of airborne ammonia. There is greater public awareness of the danger of particulate matter pollution to human health. They welcome the research DAERA is engaged in with partners exploring health impacts of air pollution derived from ammonia emissions and other farming activities. DAERA must ensure that any findings from the research informs its approach to ammonia pollution and the ammonia strategy.

- Forty individuals stated their belief that a government organisation have their own version of the future which they have not shared with the farmers nor farming organisations so helping to create confusion and indecision. They further stated that this document provides little practical understanding of what we are facing into as it presents some very large unknowns which they are expected to comment on. Greater clarity and help to support their farming businesses is now needed as all they see within this document is a gradual decline of their farm income and farming standards.

- Campaign response A and 31 individuals stated that consideration should be given to the exploration of all potential avenues for the future funding for all farmers including small family farms. Consideration must be given to the impact of the provision of agricultural relief

as a result of land moving away from food production. Consider the effects of ammonia produced by large intensive poultry and livestock units and its impact on designated sites, the department already recognises that within agriculture different production methods have different emissions output. We live on an island where emissions do not recognise borders. Ammonia needs to be considered as a long-range pollutant because of the islands atmospheric and topographical conditions. There are challenges for the effective modelling of ammonia emissions and there must be an all-Ireland approach to addressing ammonia. DAERA need to accurately assess the scope and scale of ammonia emissions on an island wide basis. The department has not provided clarity on specific social and economic impact of the draft ammonia strategy on those farmers who will be affected in Less Favoured Areas, to which the equality data indicates that 77% are cattle and sheep farmers and who are aligned to the Equality group Religion. DAERA must carry out an economic impact assessment and equality impact assessment to ascertain the impact on cattle and sheep farmers in Less Favoured Areas (LFA).

- Thirty-seven individuals sought more information, clarity, and practical understanding of what the proposals meant at an individual farm level, the potential impact on income, the support to be provided, and the importance of certainty for business planning.

- Twenty individuals do not disagree that ammonia emissions must be controlled and reduced within NI with some agri industries being in a 'better place' than others regarding ammonia mitigation and control. However that does not mean that with proper science and investment that this cannot be the outcome for all. The frustrations and lack of decision making for many existing farms occurs as we don't fully understand what further restrictions are going to be enforced upon individual farms in the near future due to changes to the Operational Protocol for assessing air quality and implementation of the Kunming-Montreal Global Biodiversity Framework. As farmers typically work to 3-5 year business plans together with the necessary financial planning also required they believe that for the industry to remain sustainable any expenditure that farmers are expected to make in order to lower emissions is clearly set out to take account of these timeframes and that they will not then be expected to expend additional sums within a short period of time to meet further standards. This in our view is simply not sustainable for the industry. Within the 19 responses 6 also restated the belief stated by the 37 individuals above.

- An individual stated that ammonia emissions must be controlled and reduced within N Ireland, and this must be done in a planned way. The fear they as a farmer are being asked to spend a lot of money and then being asked to spend additional money on top of that in a few years' time. This is simply not sustainable for any business where long-term planning (3 to 5 year) is essential to ensure continued viability of the business. They implore DAERA to work with the farming community to agree the strategy together to deliver a cleaner environmental footprint while showing how a strong economic model for food production can be achieved. This can only happen if relevant stakeholders come together and work with each other and not as currently stands differing groups in isolation trying to impose restrictions on the weakest link i.e. the farmer. Exporting food production in the current socioeconomic climate must not be allowed to happen to reduce ammonia levels.

- An individual would like to see evidence of the damage that ammonia is supposedly doing to designated sites and this needs to be backed up by published, reliable, repeatable, and verifiable science to demonstrate how ammonia levels are measured and calculated.

- An individual would like to understand how accurate modelling is versus on the ground science.

- An individual stated that it cannot be the case that a 'one size fits all' approach is taken across all sectors. Each sector should be given its own target and be measured in its own right. DAERA must recognise and support the work done by individual sectors and indeed individual farmers within sectors and allow them to develop their businesses accordingly. The progress of one sector cannot be strangled by the lack of progress in another or the hard work and investments of one individual farmer held to ransom by the lack of effort by his neighbour. The final output must be fair and equitable to all.

- An individual highlighted engaging with the other enforcement agencies in NIEA and the local councils e.g. planning, building control, to provide a holistic approach to monitor progress, reducing ammonia and improving biodiversity. They suggested a data gathering (IT) and reporting system that all parties can report to easily to inform decision making.

- An individual stated that all they have seen in the document is gradual reductions in income and standards, therefore placing their futures in doubt. It is important that NIEA and DAERA work closely with the farmer going forward to ensure sustainability both financially and environmentally for everyone.

- An individual stated that this consultation must educate and engage and provide opportunities to review and amend the path of progression where appropriate.

- An individual stated that they want to be treated as an individual farm as they can't affect what is going on beside them.

- An individual stated that this needs to be taken into account with the carbon count on farms and done jointly as it is not a separate issue.

- Further responses from individuals also stated: the importance of engagement; consideration of farmers and farming families before new legislation is implemented; concerns regarding LESSE; the potential for foliar feeding and use of humates; that there has never been such an uncertain time in farming; and the role of biology in circular farming systems.

Concerns related to food security

- Seven individuals stated concerns related to food security and self-sufficiency. Concerns included movement to reduce food production at a time of increased demand; that becoming self-sufficient in food production should be the UK's first objective; that reducing food output and importing food to make up the shortfall makes no sense; that farmers should be supported in their role as food producers, that restricting livestock production in NI will increase carbon footprint.

Not supportive

- Nine individuals were not supportive of the measures and targets in the draft strategy and raised a number of areas. These included: no indication of effects from neighbouring countries; that NI should not be a guinea pig; that NI is more dependent on farming than other European countries; and the impacts on sustainability of farm businesses, NI industries, rural areas, local employment, and tourism.

No comment

- A Council and 8 individuals had no comment to make in relation to the question.

Annex A

I. List of consultation questions

Q1: What are your views on the Northern Ireland wide 2030 targets outlined in the 3.1 Targets section?

Q2: What are your views on the proposed pillars of the Ammonia Strategy?

Q3: What are your views on how DAERA will enable this strategy?

Q4: Do you have any comments on the proposals for low emission livestock housing?

Q5: Do you have any comments on the proposals for emerging technologies?

Q6: Do you have any comments on the proposed additional progression point in the move towards LESSE adoption requiring slurry which is being exported between farms to be spread by LESSE from 1st January 2025?

Q7: What are your views on the proposal to require all slurry to be spread by LESSE by 2026?

Q8: Do you have any comments on the proposals to encourage implementation of longer grazing seasons?

Q9: Do you have any comments on how to reduce ammonia emissions from chemical fertiliser, including the potential introduction of a prohibition on the use of unprotected urea fertiliser?

Q10: Do you have any comments on the proposals to reduce crude protein levels in livestock diets?

Q11: What are your views on the proposals relating to improving feed efficiency through genetic improvement?

Q12: What are your views on the proposals to encourage tree plantations around livestock housing?

Q13: What are your views on how to encourage the safe covering of existing above ground slurry stores and lagoons?

Q14: What are your views on DAERA's plans to support ammonia reduction measures through Green Growth and future agricultural policy?

Q15: What are your views on DAERA's plans for knowledge transfer and education on ammonia reduction?

Q16: What are your views on the proposals for spatially targeted measures around designated sites?

Q17. What are your views on the proposed conservation actions to restore habitats and support sustainable development?

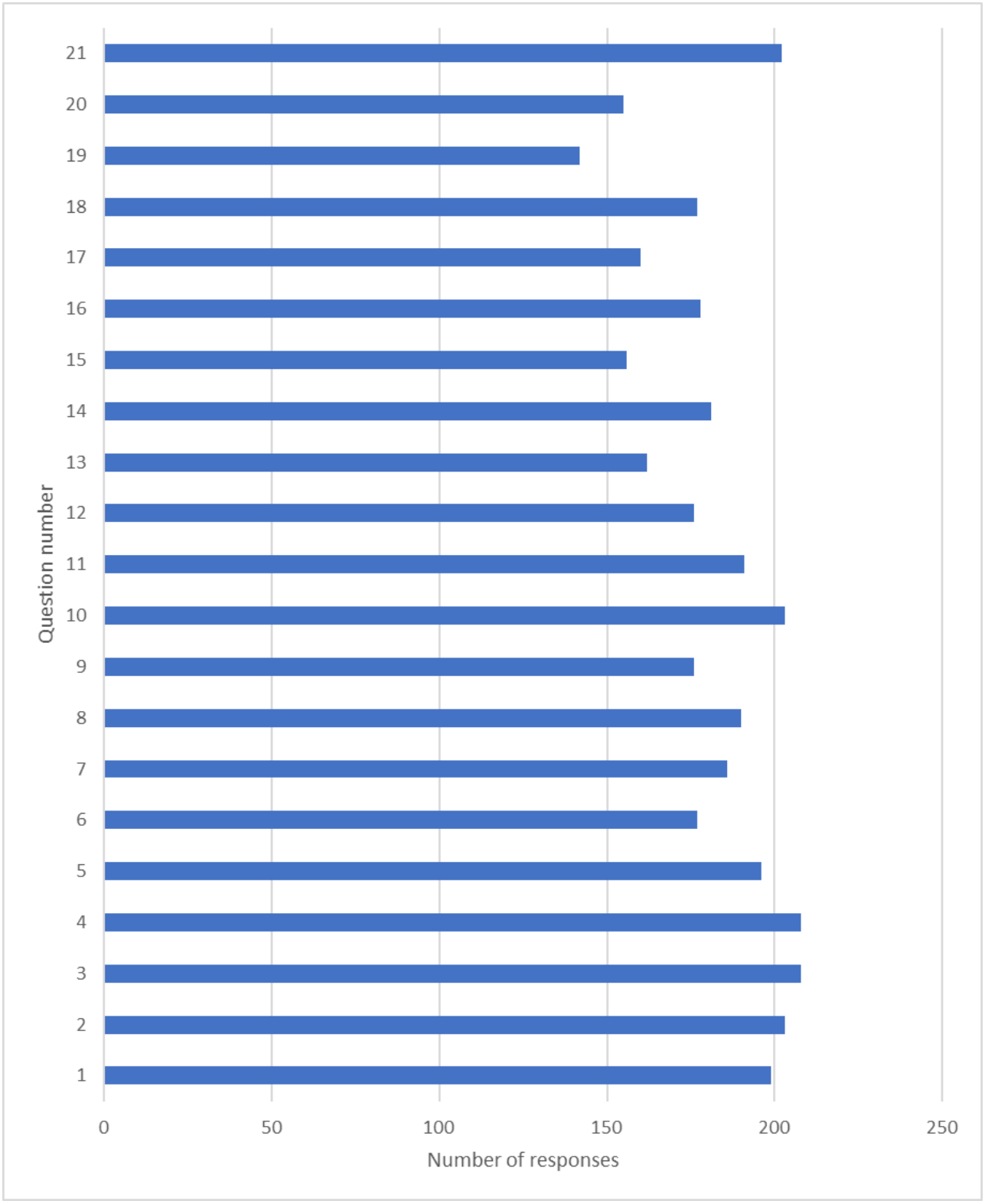
Q18. What are your views on the appropriate delivery and funding mechanisms to deliver habitat restoration?

Q19: Do you have any comments on what evidence or issues should be considered when assessing these impacts?

Q20: What are your views on how DAERA should work with stakeholders to inform the direction and delivery of the strategy, and the detail of the various measures?

Q21: Do you have any other comments or contributions on this document?

II. Number of responses to each question



Annex B

I. Organisations/Representative Groups who responded to the consultation

1	Armagh City, Banbridge and Craigavon Council
2	Anaerobic Digestion and Bioresources Association
3	Alliance Party
4	Belfast Hills Farmers
5	Blakiston Houston Estate
6	Council for Nature Conservation and the Countryside
7	Dairy Council
8	Derry and Strabane District Council Planning Department
9	Farm Design Solutions
10	Farmers for Action
11	Fermanagh and Omagh District Council
12	Foyle Food Group
13	Friends of the Earth
14	Keep Northern Ireland Beautiful
15	Mid and East Antrim District Council
16	Moy Park
17	National Trust
18	Nature Friendly Farming Network
19	NI Water
20	Northern Ireland Agricultural Producers Association
21	Northern Ireland Grain Trade Association
22	Northern Ireland Environment Link
23	National Sheep Association
24	Office for Environmental Protection
25	Poultry Industry Federation
26	Revelins Hill Design
27	Royal Society for the Protection of Birds
28	Rural Community Network
29	Sinn Fein
30	Stream Bioenergy
31	Tom Elliott MLA
32	Ulster Farmers Union
33	Ulster Wildlife Trust
34	Woodland Trust
35	Yara
36	Young Farmers' Clubs of Ulster

II. Individual Stakeholders who responded to the consultation

Reginald	Abernethy		John	Faulkner
Philip	Abernethy		Anthony	Feely
Peter	Alexander		Anthony	Feely
Nikki	Ardill		Angela Boyle	Feely
Stephen	Bell		Angela	Feely
Denver	Bloomer		Paul	Fegan
Barney	Bradley		Stephen	Flanagan
Christopher	Breen		Gilbert	Fletcher
Richard	Brown		Laura	Fletcher
William	Browne		Tom	Forgrave
John	Buick		John	Forsythe
Adrian	Caldwell		Robert	Forsythe
Jonathan	Campbell		Terence	Fox
Damian	Carey		Shane	Foy
JJ	Cavanagh		Karen	Foy
John	Connolly		Stephen	French
Stephen	Connolly		Robert	Fyffe
Gerry	Connolly		WG	Galway
Mary	Connonly		William	Gamble
Christopher	Conwell		Thomas	Gardiner
Peter	Cowley Morgan		Julie	Gardiner
Leslie	Craig		David	Geddis
Wesley William	Crawford		Wesley	George
Sandra	Crawford		Benson	George
Margarette	Crawford		Michael	Gillespie
Wylva	Crothers		Sinead	Goodwin
Richard	Crudden		Sean	Goodwin
Roy	Cunningham		Bertie	Gordon
Alastair	Dale		Andrew	Greene
Damian	Daly		Gary	Greene
Gregory	Daly		Siobhan	Greene
Richard	Dane		Andy	Greene
David	Davidson		Rory	Greene
James	Davison		Sheamus	Greene
Simon	Davison		Sireen	Greene
Conor	Digney		Julia	Greene
Alastair	Dobbin		Patrick	Greene
Matthew	Dunne		Daphne	Greene
Paul	Elliott		Kevin	Grimes
Farm Theory NI			Declan	Grimes

Thomas	Hempton		Alan	McFarland
George	Henderson		John	McGahie
Brian	Henry		Patrick	McGinley
Malachy	Hughes		Bernard	McGrath
David & Mary	Hunter		Peadar	McKenna
Adam	Hunter		Matthew	McKeown
Alan	Huston		Tom	McKeown
David	Irvine		Simona	McKinstry
Derek	Jefferson		Samuel & Ian	McLean
Jordan	Jones		Samuel	McLean
Harry	Jones		Denver	McLean
David	Kennedy		Enda	McLernon
Timothy	Kernaghan		Angela	McManus
Dorothy	Kernohan		Jason	McMinn
David	Kernohan		Sean	McNaughton
Joel	Kerr		John	McSherry
Karl Edmund	Kerr		Stephen	McSwigin
Sam	Knipe		Michael	McVicker
Edward Stewart	Law		Gareth	Millar
Philip	Lennon		David Ian	Millar
Randal	Livingstone		Mark	Millar
Tom	Lyle		Patrick	Moane
Derek	Lyttle		Frank	Moane
Vincent	Mallon		Roy	Moffett
Alastair	Martin		Kyle	Molyneux
Colin	Martin		Trevor	Montgomery
Ruth	Mawhinney		Samuel	Montgomery
Fred	Maxwell		William	Montgomery
Sean	McAleer		John	Mooney
James	McAleer		Derek	Moore
Marty	McAleer		Peter Cowley	Morgan
John	McAuley		Joan	Murphy
Ivan	McBride		Gareth	Murray
Colin	McCabe		Richard	Newell
Joseph	McCarroll		Andrew	Patterson
Ryan	McConnell		Mark	Pentland
Christopher	McCready		Fiona	Peters
Michael	McCullagh		Lewis	Potts
Justin	McElduff		Dermot	Quinn
Oliver	McElvogue		Brian	Quinn

Hugh	Rafferty
K	Rankin
William	Reid
David & Sylvia	Potter
Lewis	Potts
Robert	Reid
Eric	Reid
James	Robinson
Eugene	Robinson
David	Russell
Kevin	Scullion
Noel	Smith
Raymond	Smith
Richard	Smyth
Joseph	Stinson
Gerard	Stranney
Harry	Thompson
Jonathan	Tuft
Adam	Turtle
Victor	Turtle
Colin	Watt
Ronnie	Wells
Jason	Wilkinson
Susan	Wilson
Sean	Wray
Roy	Wright
Seamus	
Alistair	
Stephen	

III. Campaign Response A Respondents

Respondents to Campaign A are listed below in alphabetical order. There were a further 14 respondents whose name could not be determined from their signature. All respondents provided their address.

G	Baile
Noel	Beggan
Derek	Bogue
Kevin	Boster
Barry	Boyle
Jimmy	Boyle
Thomas	Breslin
Kiara	Campbell
Leo	Campbell
Tony	Cannet
Barny	Carey
Cathal	Carey
Martin	Carey
Mary	Carey
C	Clifford
P	Clifford
Brian	Collins
Tom	Conely
Marty	Conwell
Cahal	Cosgrove
Gerard	Cumen
Paddy	Curran
Ronan	Curran
Eugene	Danny
K	Foy
Patrick	Foy
Peter	Foy
Shane	Foy
D	Gillford
B	Gleeson
M	Gleeson
P	Gleeson
Wesley	Granlesse
Bernie	Greene
Brendan	Greene
Ecko	Greene
Philip	Greene
Lauren	McDonagh
	McDonagh

Rosaleen	Greene
Shauna	Greene
Mary	Greenleese
Angela	Groadain
Martin	Gunn
Sean	Gunn
Vincent	Gunn
Coleen	Hayes
Michael	Hill
Barry	Leonard
Mandy	Leonard
Laim	Lesley
Lesly	Lilly
John	Lynch
Kevin	Lynch
Liam	Lynch
M	Lynch
Millie	Lynch
P	Lynch
S	Maguire
Tom	Maguire
Michael	Mauren
Bridget	McAlean
Seamus	McAleer
Patrick	McAloon
Donna	McBride
F	McCaffrey
E	McCarney
J	McCarney
Daren	McConnell
Benny	McDermott
Caroline	McDermott
M	McDermott
A	McDonagh
Dominic	McDonagh
Fanny	McDonagh
Fiona	McDonagh
Eileen	Rice
Philip	Rice

M	McDonagh
Mark	McElroy
Phil	McGovern
Noel	McMahon
Sadie	McMahon
L	McQuaid
Noel	McShey
Gerard	Moane
Kieran	Moane
Maria	Moane
Declan	Mohan
G	Mohan
Gerard	Mohan
Jim	Mohan
M	Mohan
Philip	Mohan
Sinead	Mohan
Thomas	Mohan
C	Moran
Eilish	Morgan
B	Mulligan
B	Mulsamerey
John	O'Donneell
Ciaran	O'Donnell
Colum	O'Donnell
James	O'Donnell
Joseph	O'Donnell
Kevin	O'Donnell
M	O'Donnell
Thomas	O'Hare
C	O'Neill
F	O'Reilly
Thomas	O'Reilly
James P	O'Rourke
Cristopher	Orr
Marie	Orr
Stephen	Orr
Rory	Raferty
Aidan	Rafferty
Nicholas	Riae

Pat	Sharkey
Christine	Shevlin
Fergal	Shevlin
Gabriella	Sweeney
Seamus	Sweeney
Teresa	Sweeney
V	Sweeney
Gerald	Treacy
Jackie	Treacy
Thomas P	Yarmen
Daiti	
Martin	

IV. Campaign Response B Respondents – listed in alphabetical order

James	Allister
Jonathan	Ballentine
Beverley	Beattie
Stephen	Beggs
Connor	Bennett
Christina	Benson
Dean	Blackwood
Eoin	Bleakney
Barbara	Boyle
Ruairi	Brogan
Ruth	Brownlow
Colin	Buick
Sinead	Burley
William	Caldwell
Aidan	Campbell
Rebecca Grindin	Clarke
Roger	Clifford
Noreen	Collins
Denice	Corbett
Rebekah	Corbett
Gillian	Creane
Gerry	Crudden
Lara	Curry
Patrick	Cusack
Graham	Day
Yasmin	Deal
Mary	Delargy
Orla	Devine
Sinead	Devine
Sorcha	Diver
Clare	Dorman
Trudi	Dunbar
Richard	Dyer
Denise	Ef
Nikki	Elliot
Hannah	Evans
Liane	Faust
Orla	Feeney

Jo	Finburgh
Sharman	Finlay
Mary	Finnegan
Tim	Fogg
Adeline	Frew
Paul	Fulton
Rosemary	Fulton
Anna	Gavurin
Rosemary	Glendinning
Denise	Glover
Darragh	Graham
Siobhan	Greene
Orla	Haberlin
Alison	Hamilton
Anne	Harper
Seamus	Harrell
Mary	Hawkin
Kara	Hegarty
William	Henderson
Collette	Henderson
Kerry	Henry
Petra	Hola
Sally	Houston
Gary	Houston
Clare	Johnson
Mandy	Jones
Graham	Jones
Colm	Kelly
John	Kelly
Denise	Kelly
Rachel	Kennerley
Mary	Kerrigan
Emer	Kieran
George	Kilpatrick
Lisa McGrath	Kim White
Thomas	Lilburn
Ian	Lyttle
Natasha	M

Kevin	MacKenzie
Karen	Magowan
Beatrice	Mahoney
Meg	Malone
Angela	Marchant
Stephen	Martin
Ruth	Maxwell
Paul	May
Eleanor	Maynard
Roma	Mc
Vincent	McAlinden
Doreen	McBride
Donna	McC
Ashly, Cronin	McCartney
Ruth	McCartney
Ciaran	McClean
Aileen	McClenaghan
Maria	McCloskey
John	McCormick
Laura	McCoy
Karl	McCreadie
Suzanah	McCreight
Roisin	McDade
Luke	McGibbon
Mary	McGuigan
Eileen	McGuiggan
Barry	McKee
Seamus	McKendry
Gillian	McKillop
Eleanor	McKittrick
Deborah	McLaughlin
Jamie	McLellan
Brendan	McManus SJ
Andrew	McMurray
Shelley	McPherson
John	McSorley
Bridget	Meehan
Johanne	Meredith
Sally	Milligan
John P	Mohan

Deirdre	Moore
Sharon	Morrow
Chistina	Muldoon
Brenda	Murphy
Murdo	Murray
Massimiliano	Nastri
Micah	Newman
John M	Niven
Eamonn	Nixon
Bridget	No Bowley
Carina	Nugent
Linda	Odonovan
Trevor	Ogborn
James	Orr
Declan	Owens
Sharon	Page
Dawn	Patterson
Fiona	Patterson
Lewis	Potts
Tim	Puddle
Diane	Quate
June	Regan
Jackie	Ritchie
Jane	Robinson
Thomas	Ross
Unni	Ross
Natalie	Rowed
Anne Marie	Russell
Gemma	Sandford
Matilda	Sardi
Colin	Shaw
Danielle	Shortall
Mark	Slater
Kerry	Smyth
Catherine	Stewart
Richard	Stewart
Norma	Stewart
Colette	Stewart
Lynda	Sullivan
Slavka	Sverakova

Mairead	Sweeney
Colin	Thompson
Miriam	Turley
Austin	Walker
Emma	Wallace
Michael	Wallace
Brian	Ward
Julia	Webb
Marilyn	Wickstead
Rachel	Woods
Sacha	Workman

Annex C

I. List of Abbreviations

AD	Anaerobic Digestion
AI	Artificial Insemination
ASSI	Area of Special Scientific Interest
BPS	Basic Payment Scheme
CAFRE	College of Agriculture, Food and Rural Enterprise
CBD	Convention on Biological Diversity
CEDAR	Centre for Environmental Data and Recording
CEH	Centre for Ecology and Hydrology
CMP	Conservation Management Plan
CO2e	Carbon dioxide equivalent
COP15	The United Nations Biodiversity Conference
CP	Crude Protein
DA	Disadvantaged Area
DAERA	Department of Agriculture, Environment and Rural Affairs
EDZ	Emission Displacement Zone
EMIND	Evaluating and mitigating impacts of N deposition to Natura 2000 sites in Northern Ireland
EQIA	Equality Impact Assessment
FAP	Future Agricultural Policy
FCR	Feed Conversion Ratio
FBIS	Farm Business Improvement Scheme
GIS	Geographic Information Systems
INTERREG VA	A European Union funded programme designed to promote greater levels of economic, social and territorial cohesion across the Programme area.
IPPC	Integrated Pollution Prevention and Control
K	Potassium
LESSE	Low Emission Slurry Spreading Equipment
LFA	Less Favoured Area
METS	Manure Efficient Technology Scheme
N	Nitrogen
NAP	Nutrients Action Programme
NGOs	Non-governmental organisation
NI	Northern Ireland
NICS	Northern Ireland Civil Service
NIEA	Northern Ireland Environment Agency
NUE	Nitrogen Use Efficiency
P	Phosphorus
PD	Permitted Development

PM2.5	Particulate Matter - fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller
RNIA	Rural Needs Impact Assessment
RoI	Republic of Ireland
SAC	Special Area of Conservation
SDA	Severely Disadvantaged Area
SES	Shared Environmental Services
SMART	Specific, measurable, achievable, relevant, and time-bound
SPA	Special Protection Area
TAMS	Targeted Agriculture Modernisation Scheme