The Protection of Waters against Pollution from Agriculture

Consultation on Implementation of the Nitrates Directive in England 2013-2016

December 2011

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defra
Department for Environment
Food and Rural Affairs

Printed on paper containing 75% recycled fibre content minimum.

PB13679

Purpose and Scope of the consultation

The purpose of this Consultation Paper is three-fold:

- to seek your views on options for revised Action Programme measures to control nitrogen pollution from agricultural sources from 2013 onwards;
- to ask whether you think we should apply these measures within discrete Nitrate Vulnerable Zones or throughout the whole of England; and
- to set out some proposals to rationalise the Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) Regulations 2010.

If the measures are applied in discrete Nitrate Vulnerable Zones, this consultation also tells you

- how we intend to identify those Nitrate Vulnerable Zones; and
- about the process for challenging the designation of land as a Nitrate Vulnerable Zone.

The proposals set out in this paper are relevant to all farmers of agricultural land in England. The Scottish and Welsh Governments are undertaking similar consultations for the Action Programmes that will apply in their territories from 2013 and the options presented here have been developed in consultation with them. There are, however, some differences between the administrations in approach due to differing environmental conditions and agri-environment policies. Northern Ireland's Action Programme came into force in 2011 and therefore there is no review being undertaken.

The consultation options and proposals have been built upon informal discussions and consultations with a wide range of stakeholders and upon the evidence from research into the effectiveness of the existing Action Programme.

This consultation is accompanied by an impact assessment which will be available for viewing on the Defra website.

The Consultation includes a number of questions that can be answered with a simple "Yes" or "No". Others offer you the opportunity to give us the reasons for your views. Even if you only have time for answers to these Yes / No questions, you will be helping us significantly. To streamline the process of replying to this consultation, we have provided a form in Annex 4 on which you can simply tick your headline preferences if you wish. It also has space for you to provide further commentary.

How to contribute

The closing date for this consultation is 16 March 2012. Responses should be sent to the following email address:

nitratesdirectiveteam@defra.gsi.gov.uk

Or by post to: Nitrates Team, Department for Environment, Food and Rural Affairs
Area 2B, Ergon House, Horseferry Road, London SW1P 2AL

Additional ways to become involved: Please contact us if you wish for these documents to be made available in a different format and we will endeavour to accommodate your request.

After the consultation: After the consultation closes, the consultation and responses will be further considered. Defra will then issue a formal response detailing the responses received and how these will be taken forward. This is expected to be issued around April 2012.

Compliance with the Code of Practice on Consultation: This consultation complies with HM Government's Code of Practice on Consultation.

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1. Ministerial Foreword

The National Ecosystem Assessment, published earlier this year, showed how important and economically valuable a thriving natural environment is. Water is a common and essential factor in all our natural habitats, so delivering better water quality benefits us all as expressed in the recent Water White Paper.

We have made good progress since the last review of the Nitrates Directive in 2007. The picture emerging from water monitoring is positive. Nitrate levels as a whole are lower, and although there is a fair amount of variability, there are far more sites where nitrate concentrations are decreasing than sites where they are increasing. However we still need to persevere, to ensure there is continuous improvement. Alongside this we must always be mindful of the impact of the Directive on the industry.

It is a priority for this Government to reduce the burden of regulation on industry. Implementation of the Nitrates Directive is widely believed to be an example of excessive prescription in regulation. That is why we asked the Task Force on Farming Regulation to make recommendations on how we might reduce these burdens, consistent with also achieving our environmental objectives. In this consultation we have taken the opportunity to step back and explore how the goals of the Nitrates Directive can be achieved in a more cost-effective and less bureaucratic manner, consistent with the Task Force's recommendations.

Getting the balance right, between providing high quality water and freeing up the farming industry, is not always easy. This is your chance to say where you think we should strike it in implementing the Nitrates Directive.

Richard Benyon.

Richard Benyon
Minister for the Natural Environment and Fisheries

Introduction

1.1. The Nitrates Directive is intended to reduce water pollution caused by nitrates from agricultural sources. We are required to review our implementation of it every four years. Since its agreement in 1991, implementation in the UK has evolved as we have developed our understanding of the Directive itself and as the evidence base has grown. The last review, in 2007, eventually resulted in the designation of 62% of England as Nitrate Vulnerable Zones (NVZs) and introduced a strengthened range of measures in the Nitrates Action Programme that farms within NVZs must comply with.

1.2. Much has happened since the last review. In broad terms nitrate pollution has fallen, though there have been some areas where it has increased. It is difficult to ascribe causes with certainty, though one important factor in addition to the effect of the Nitrates Action Programme is likely to have been the continuing reduction in the use of manufactured nitrogen fertilisers.

1.3. The Government's policy of supporting sustainable intensification in agriculture means increasing production while enhancing the environment and biodiversity and supporting a strong green economy. One aspect of enhancing the environment is the implementation of the Water Framework Directive, and the size of this task is becoming increasingly clear. In 2009 only about 26% of water bodies in England met the Directive's objective of good status. To raise this figure, the Government announced on 22 March 2011 its intention to take a catchment-based approach (working with local people to find local solutions to local challenges) to meeting the Directive's aims more widely. This was an approach that the Task Force on Farming Regulation strongly endorsed in its report to the Government, published in May. The Task Force also emphasised the important role of good evidence to underpin policy-making and strongly advocated freeing farming from unnecessary red tape.

1.4. A further important development has been the increase in our understanding through the National Ecosystems Assessment of the work that a healthy environment does for us just by being there. As was set out in the Natural Environment White Paper, the Government wants the true value of nature to be built into all the decisions it makes. This means, as far as we are able, taking into account the effects of policies not only on nitrate pollution, but also on phosphate, sediment, ammonia and greenhouse gases in the environment.

1.5. The review of designations and the Action Programme is being carried out against this background. Capturing the most recent evidence of nitrate pollution and research on how effective Action Programme measures are, and making best use of it, is key to the review's success. We have taken a number of steps to address the lessons of previous designation processes, and incorporated research specifically commissioned to answer questions raised when the last Action Programme was drawn up. We have also thought about instances where reducing nitrate pollution may increase other forms of pollution, and tried to strike the right balance between them.

1.6. Chapter 3 asks you whether you think we should continue with the designation of NVZs in England or take up the option of designating all of England as a single NVZ. To help you give an informed view, it sets out analysis of the two options, and indicates (based on our current understanding of the most recent data) where NVZs would be if the former option were chosen. It also gives a brief description of how NVZs would be identified.

1.7. Chapter 3 also provides you with early information about how you would be able to challenge the designation of land you own or occupy as NVZ, if we continue with the discrete designation of NVZs in England.

1.8. Chapter 5 deals with the measures in the Action Programme. Here, to manage the length of the document, we concentrate mainly on what may change from the current Action Programme. We also present a brief summary of the evidence and analysis for each option. Further evidence can be found in the supporting papers published alongside this consultation.

2. Timeline Overview

2.1. The Nitrates Directive requires us to review both our designation of NVZs, and the Action Programme of measures that applies inside them, every four years. We are required to do this, and have any new designations and measures in place by 1 January 2013. The outcome of this process, particularly the shape of the Action Programme, will depend not only on your responses to this consultation but also on negotiations with the European Commission.

2.2. This consultation is a key stage in the current review of the designation of NVZs and consideration of the Action Programme. To get to this stage work has been ongoing for the last 12 months on both the methodology which will be used to identify NVZs and the Action Programme.

Methodology

2.3. If we opt again, as we have up to now, to designate discrete NVZs, the actual process for the designations will be similar to earlier rounds. But over the last 12 months we have established and been working with a Methodology Working Group to ensure that the method for identifying NVZs makes use of the best techniques and data available, and in particular learns the lessons from previous experience. A key feature of the Methodology Working Group has been the inclusion of farming representatives and independent academics who have been able to inform and challenge the development of the methodology throughout. The establishment of this group, with NFU, CLA and NFU (Cymru) representatives, has provided a high level of transparency to an otherwise very technical process and has enabled informed debate, challenge and change. The methodologies were agreed in principle by the Methodology Working group on the 16 November 2011. The full methodologies will be published on the Defra website early in 2012. The details of the membership of the group are included as part of Annex 2.

2.4. Looking forwards, if we designate discrete NVZs again, we would expect to publish firm recommendations, with field level maps on where these will be, in April 2012. There would then be a period during which any challenges to the recommended designations could be made, and following consideration and adjudication of those appeals, we would intend to publish final NVZ boundaries in autumn 2012, to be applied from 1 January 2013 onwards.

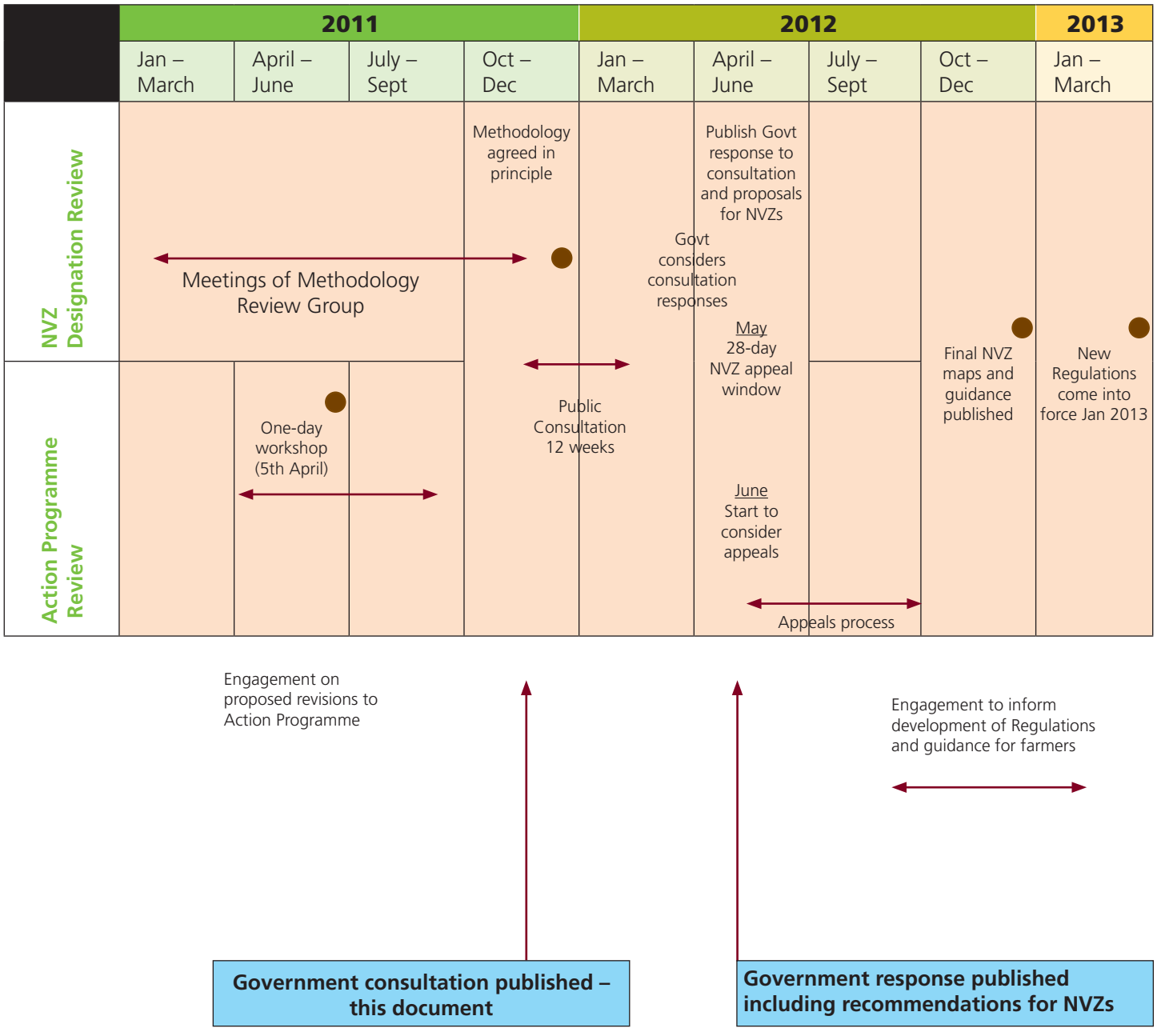
Revision of the Action Programme

2.5. The proposals in this consultation for changes to the Action Programme reflect developments in our understanding of the pathways of agricultural pollution and key inputs of research that Defra has commissioned. The early findings of this research were shared with farming representatives at a stakeholder workshop in April 2011, to explore the advantages and disadvantages of differing options.

2.6. In parallel with this consultation, we will be further discussing the Action Programme with both the Commission and farming representatives such as the NFU and CLA. We will review your responses to this consultation and use the evidence you provide, to support our discussions with the Commission. The Government aims to publish its final intentions around April 2012, though the precise timing is also dependent on discussions with the Commission. Following agreement of the final package, we will draft the legislation necessary to bring it into force, again consulting farming representatives to ensure we get the detail right.

2.7. The chart below seeks to summarise this timeline.

Chart 1: Timeline Overview



3. Designation of discrete Nitrate Vulnerable Zones or Whole England

3.1. The Nitrates Directive requires, as a minimum, the designation as discrete Nitrate Vulnerable Zones of all land that drains into polluted waters, within which an Action Programme of measures is implemented by farmers. If they wish, Member States may instead apply Action Programmes across the whole of their national territory. Most of the northern EU countries have opted for this approach, including the UK in respect of Northern Ireland.

Option 1

3.2. To date we have taken a targeted approach and designated NVZs, which currently cover approximately 62% of England. This is consistent with the objective of the Directive, which aims to reduce pollution where it occurs and ensure that those who contribute to it take action to reduce the pollution. In other words, this approach encapsulates the 'polluter pays' principle. It also ensures that burdens are not imposed on those whose land does not drain to nitrate-polluted waters and therefore ensures that the minimum of additional costs are directly associated with implementation of the Directive.

3.3. There are also drawbacks. The four yearly cycle of reviewing water quality creates uncertainty for farmers, whose land may be removed from NVZ designation at one round and then re-designated at the next, or vice versa. This can make it difficult to take a long term view and get investment decisions right. Having land within an NVZ also puts farmers at a competitive disadvantage to those outside NVZs, because they alone bear the extra costs of complying with the Action Programme. Areas which are likely to fall outside NVZ designation are generally those with higher rainfall – this means that the nitrate lost to water is subject to more dilution.

3.4. Adoption of the targeted approach would mean modest changes to the current designation picture. The indicative figures for the total area designated would remain at around 62%. While there is little change in the overall figure there would be a number of new NVZs as well as some land which would no longer be a NVZ. A description of the methodology and the indicative areas that may be designated as NVZs are included in Annex 2. These maps are very much work in progress and we will update the Defra website at a mid point in this consultation.

Option 2

3.5. As an alternative, we could opt to apply the Action Programme throughout England, as has been done in Northern Ireland. For this consultation we will call this a 'Whole England' approach. We know that we need to improve water quality (including reducing ammonium, phosphorus and sediment, not only nitrate) across much of the country to deliver our objectives of cleaner water. Agriculture is also the main UK source of nitrous oxide and of ammonia, which poses a risk to human health and damage to sensitive habitats. We recognise the need to reduce emissions of these nitrogen compounds. These are challenging objectives.

3.6. The Government announced its intention to take a catchment-based approach to implementing the Water Framework Directive on 22 March 2011. This is a process to deliver all the aims of the Water Framework Directive (including good water status) jointly with stakeholders at a catchment level, working together to generate the evidence base and develop solutions to local issues. The approach is already being piloted in 25 catchments; 10 hosted by the Environment Agency and a further 15 hosted by third parties. The agency will also be supporting activities in a further 55 catchments where third parties have expressed an interest. The aim is to establish a catchment approach everywhere in the next cycle of River Basin Management Plans starting in 2015. This more holistic approach was strongly supported

by the Task Force on Farming Regulation. The Task Force also suggested that this local approach should complement some national measures in NVZs, including suggestions on closed periods for slurry spreading and the need for storage capacity for solid manure and slurry. One way to deliver this would be to apply the Action Programme throughout England, which would then set the baseline for English farming practice for addressing nitrate pollution of water. Where necessary to deal with catchment-specific issues, the catchment approach would then provide further, targeted support to farmers.

3.7. As well as supporting delivery of the catchment-based approach as a key recent development in the control of agricultural diffuse pollution, there are other reasons to apply the NVZ Action Programme on a 'Whole England' approach. It would remove the uncertainty and the competitive inequalities highlighted above, and move towards the longer term aspirations of the Task Force on Farming Regulation to deliver coherent interventions on Defra's two main priorities – supporting agriculture and improving the environment.

3.8. A 'Whole England' designation would therefore provide an early opportunity to develop the sort of integrated approach to a number of different though related issues which the Task Force recommended. When we consider the many-stranded requirements of the Water Framework Directive, as well as other key objectives on air quality and reducing greenhouse gas emissions, there are likely to be efficiency gains (for example, emerging results from some work ADAS has been doing for us suggests that a 'Whole England' approach would increase the greenhouse gas benefits of the Action Programme by more than 50%). Using a single legal instrument to set a baseline level of nutrient management on farms would give us the opportunity to coordinate action aimed at achieving our objectives and make the base line rules as simple as possible. It would also remove competitive inequalities and the uncertainty associated with the four-yearly Nitrates cycle.

3.9. Such an approach would make it difficult to determine the costs on the agriculture industry attributable to implementation of the Nitrates Directive. It may appear that costs would be higher than with discrete NVZs though being able to coordinate basic measures to deliver the Water Framework Directive, air quality and climate change policy objectives within one instrument would facilitate minimising the costs on the industry overall by ensuring that measures were fully integrated.

Question 1

Do you prefer Option 1 (continuing with discrete NVZ designations) or Option 2 (applying the Action Programme to a 'Whole England' NVZ)?

The Department would welcome comments on the advantages and disadvantages of the two options and the reasons why you prefer one over the other.

Appeals

3.10. If ministers conclude that discrete NVZs remain the correct approach we intend to publish the Environment Agency's recommendations for NVZ boundaries around April 2012. We anticipate that the Secretary of State would be minded to accept those recommendations, subject to any errors of fact that might be identified. Despite our best endeavours you may consider that, when we publish the Environment Agency's recommendations for NVZs next spring, particular areas proposed for inclusion should not be included within an NVZ. If that is the case, you will be able to appeal against that recommendation.

This section is intended to help you understand the timing and opportunity for those appeals. *We are not seeking or accepting appeals at this stage* as the maps we have included here are intended to be indicative: they are not firm recommendations.

3.11. As for the 2008 round of designations, you will be able to make appeals on either or both of the following grounds: that the relevant holding, or any part of it:

(a) does not drain into water which

(i) the Secretary of State is minded to identify as polluted within the meaning of the Nitrates Directive; or

(ii) has been similarly identified in Wales or Scotland, or

(b) drains into water that the Secretary of State should not identify, or continue to identify, as being polluted within the meaning of the Nitrates Directive and accordingly the land which is the subject of the appeal should not be included within an area designated as a nitrate vulnerable zone.

3.12. These two grounds of appeal will be established through regulations. Appeals will be limited to factual matters in relation to the way in which land drains into water bodies and the level of pollution in water bodies. If you wish to appeal, you will need to provide appropriate evidence to support your case.

3.13. Since the last review the Government has established the environment jurisdiction within the General Regulatory Chamber of the First-tier Tribunal. All appeals would be heard by the First-tier Tribunal. The Tribunal is empowered to deal with a wide range of issues which might form the substance of appeals, and to ensure cases are dealt with in the interest of justice and minimising parties' costs. The composition of a tribunal is a matter for the Senior President of Tribunals to decide, and may include non legal members with suitable expertise or experience in the issues in an appeal.

Approach to deciding appeals

3.14. Appeals to the General Regulatory Chamber are governed by procedural rules, the Tribunal Procedure (First-tier Tribunal) (General Regulatory Chamber) Rules 2009 ('the Rules'). Rule 2 states its overriding objective as being to deal with a case in ways which are proportionate to the importance of the case, the complexity of the issues and the anticipated costs and resources of the parties. The Rules give the Tribunal wide case management powers in order to achieve these objectives.

3.15. The Rules are available at http://www.justice.gov.uk/guidance/courts-and-tribunals/tribunals/rules.htm. The Tribunal Procedure Committee is responsible for the Rules and for any changes that may be necessary to be made to them to accommodate these appeals, in light of the regulations which will deal with them.

3.16. The full details of the appeal process (including guidance, forms and appeal deadline) will be published early in 2012 prior to the publication of the Environment Agency's recommended NVZ designations (expected April / May 2012). A 28 day time limit would apply from the date of notification of the designations. The publishing of appeal arrangements in advance of the Government response is not linked to the decision the Government will make on whether to adopt a 'Whole England' approach. If the Government decides to apply the Action Programme to all England then the provisions for appeals will be withdrawn.

3.17. Appeals would have to be submitted by the owner or occupier of a holding within an area which the Environment Agency has recommended should be within an NVZ, or by a representative appointed by the owner or occupier. The Tribunal would be able to join appeals which raise common factual issues so groups of owners or occupiers within the same catchment, for example, might wish to make it clear in their notices of appeal that they consider that their cases should be heard together. Alternatively, the Tribunal might decide that one case should be a lead case.

3.18. Appeals could be considered by the Tribunal either on paper or by means of an oral hearing. Defra would expect that all appeals would be heard by the First-tier Tribunal within six months, although this would be a matter for the Tribunal. An appeal from the First-tier Tribunal could be made on a point of law to the Upper Tribunal.

3.19. The role of the First-tier Tribunal would be to assess the evidence submitted to it by both parties involved in a case (i.e. the owner or occupier and the Environment Agency) and to reach a decision on whether or not the appellant has demonstrated that either or both of the grounds for appeal have been met in the case. Notices of appeal would need to set out the grounds of the appeal.

3.20. To summarise:

- The Government will publish full details of appeal arrangements early in 2012.
- The Government will publish NVZ proposals in Spring 2012 and will notify owners / occupiers in writing.
- A 28 day period for owners / occupiers to consider whether they wish to appeal will start on the date the notice is issued.
- Owners or occupiers would be able to submit appeals during the 28 day period with relevant evidence.
- The First-tier Tribunal would consider any appeals under the 2 grounds over the summer and inform individual parties and Environment Agency of its decisions.
- The First-tier Tribunal decisions would either uphold, quash or vary the Environment Agency recommendations which the Secretary of State would be bound by when making the final NVZ designations.
- The final designations would be published in the autumn of 2012 along with regulations amending the Action Programme.
- The new designations and Action Programme would come into force on 1 January 2013.

3.21. Appeals which purport to challenge the methodology used for designations would not be permitted by the First-tier Tribunal, as the methodology has been subject to extensive peer review, debate and input from stakeholders.

Question 2

This section is included mainly to provide information as to our current thinking. Do you consider that the Tribunal Procedure First-tier Tribunal (General Regulatory Chamber) Rules 2009 are currently suitable to cover these appeals against designations of Nitrate Vulnerable Zones?

4. Review of the Existing Action Programme

4.1. Before making significant changes to our policies intended to reduce nitrate pollution, we should look to the evidence of whether they have been successful or whether they have been seen to be workable. The existing Action Programme has been in place since 1st January 2009. Many of the most recent surface and groundwater monitoring results have shown a reduction in nitrate concentrations, and this is no doubt due in part to the effect of the current and previous Action Programmes. The Government welcomes this positive trend.

4.2. At the same time, it should be noted that some of the key measures of the current Action Programme have yet to fully enter into force. When they do, they are likely to take a number of years to have their full effect, especially on groundwater. There are also wider trends in agriculture that are not driven by the NVZ Action Programme but are likely to be contributing significantly to the reduction of nitrate pollution of water. For example, total nitrogen fertiliser usage has broadly declined and livestock numbers have fallen in recent years which will tend to reduce the potential for nitrate pollution.

4.3. Therefore, the Department considers it too early to carry out a meaningful assessment of the Action Programme that was implemented in 2009. As a result, except where we have generated new evidence, or where our proposals are focused on reducing the administrative burden on farmers rather than changing the way farming is undertaken, we do not intend to make significant changes to the Action Programme.

5. Proposals to change the NVZ Action Programme

5.1. This section outlines the changes we propose, or are considering, making to the measures in the Action Programme. Most aspects will remain as they are now, but where there is evidence that measures can be improved upon we are considering amendments. In selecting a final package of measures the Government will be looking for the best proposals to achieve the following goals:

- Achieving reductions in losses of nitrogen from agriculture (with associated benefits of improving water quality and enhancing biodiversity)
- Improving the efficiency with which all sources of nitrogen are used on farms
- Minimising pollution swapping (i.e. reducing losses of one pollutant that results in increased losses of another pollutant)
- Delivering coherent interventions on Defra's two main priorities – supporting agriculture and improving the environment
- Fulfilling our obligations under the Nitrates Directive
- Reducing the burden of reporting for farmers

5.2. When commenting on the proposals you should be aware of the following:

- The Nitrates Directive specifically lists measures that must be included within an Action Programme and therefore there is little scope to remove completely many of the measures.
- The proposed measures are based on research and evidence. However we have presented options or alternatives for consultation purposes and in reaching a final decision on the way forward the Government will have to consider our 'best package' to achieve the above goals. There may be some flexibility to refine individual measures in relation to their form or definition but please remember the interaction between measures and the multitude of goals.

5.3. Our consultation proposals address the following issues:

A. Rates and limits on the field application of organic manures and manufactured nitrogen fertilisers

B. Closed spreading periods

C. Restrictions on manure spreading

D. Storage of organic manures

E. Planning nutrient use and keeping records

F. Cover crops

A. Rates and limits on the field application of organic manures and manufactured nitrogen fertilisers

5.4. We intend to maintain the three key application limits at the levels they are now. So the Organic Manure N Field Limit will remain at 250kg/ha of total manure N in any 12 month period, the Livestock Manure N Farm Limit will remain at 170kg/ha/calendar year of nitrogen produced by farm livestock averaged across the agricultural area of the whole farm (currently 250kg/ha on farms with a derogation), and the Nmax limits for individual crop types will also be unchanged. However, we propose to make the following technical changes.

Contribution of all organic materials to Nmax

5.5. We propose to make a technical change to the nitrogen-containing materials that must be included in calculations of nitrogen contributions to Nmax. Nitrogen fertilisers are defined in the regulations and include those derived from plant or human sources. At present the only materials that the current Action Programme requires farmers to count towards Nmax are farm livestock manures and manufactured nitrogen fertilisers. For the purposes of calculating Nmax, any crop-available nitrogen derived from sewage sludge (biosolids), compost or other organic manures that do not originate from farm livestock are simply ignored. We propose to remove this anomaly.

5.6. We consider that the crop available nitrogen from all organic manures should be counted in the Nmax calculation. This would ensure that assessments of the nitrogen supplied for crop uptake are more accurate and therefore that the chance of applying more nitrogen than the crop required would be reduced, and with it the likelihood of pollution. Crop yields would not be harmed as it will still be possible to apply the optimum amount of nitrogen that a crop required.

5.7. Alternatively, we could maintain the current narrow Nmax rule. This would prolong the risk of nitrate pollution (and quite probably other pollution such as phosphorus, since nitrogen is not the only nutrient these materials contain). In addition some farmers may be near their Nmax limit already in their calculations using the existing limited range of nitrogen sources.

Question 3

Do you agree that crop-available nitrogen from all types of organic manures should count towards the Nmax limits?

Livestock manure N efficiency standard values used in Nmax

5.8. When calculating the nitrogen contributions to Nmax, the current Action Programme requires farmers to take into account the crop available N supply from livestock manure applications, using minimum manure N efficiency standard values. These values represent the percentage of the manure total N content that has the same effectiveness as manufactured N fertiliser. They set how much of the total N content of livestock manures applied to land must be counted as contributing to the Nmax limit. The standard values implemented in January 2009 are already due to increase in January 2012.

5.9. In England we have some of the lowest standard values in the EU. Recent research reviewed the scientific evidence concerning livestock manure nitrogen efficiency values.

5.10. The review considered data collated from 127 replicated field experiments where manure N efficiency had been measured. The experiments were carried out across a wide range of sites in different geographical locations in England and Wales with different soil types, rainfall patterns, land uses (i.e. cereals, potatoes, sugar beet and grassland), manure types, manure application timings and methods, and soil incorporation strategies. The evidence showed that with current good farming practice methods of application, it is realistic to expect higher N efficiency values in practice with cattle and pig slurry than are set to apply from 1 January 2012. It showed, for example, that with spring and summer applications significantly more of the slurry total nitrogen content was available for crop uptake than from autumn and winter applications. Therefore, we propose to increase the livestock manure N efficiency standard values for these slurries to ensure that most of the readily available N (i.e. the potentially crop available N before

any N losses by leaching and other processes) is taken into account when considering nitrogen plans, and to encourage the uptake of good practice. Table 1 sets out the manure N efficiency standard values that we propose for the next Action Programme.

Table 1: Livestock manure N efficiency standard values used in Nmax for adoption in the next NVZ Action Programme in England (% of total manure N)

Manure type	Current NVZ AP from January 2009 till end of 2011	Current NVZ AP from January 2012	Proposed values in next NVZ AP
Cattle slurry	20	35	40
Pig slurry	25	45	50
Poultry manures	20	30	30
FYM	10	10	10

5.11. Advantages

- Increasing the manure N efficiency standard values will help ensure the Action Programme is based on the most up-to-date evidence.
- Recognising the crop available nitrogen contribution that organic manures make to meeting crop demand will reduce the need for manufactured fertiliser N and should increase farming efficiency.
- This proposal should also encourage a move to best practice in the handling and timing of applying organic manures to land, which will reduce nitrate pollution and manufactured fertiliser bills.

5.12. Disadvantages

- Changing the N efficiency figure so soon after the introduction of the January 2012 standard value may cause confusion.

Question 4

Do you agree with the proposed changes to the livestock manure N efficiency standard values used in Nmax?

What concerns or benefits do you think this change may raise?

Organic Manure N Field Limit for composts

5.13. The Task Force on Farming Regulation heard concerns that application of the Organic Manure N Field Limit is inappropriate for composts that have a very low readily available N content, and therefore a low risk of leaching. The Task Force considered the current limit (250 kg N/ha in any 12 month period) does not allow enough of these materials to be used to satisfy plant needs in some instances. Defra have been considering compost use in agriculture and the typical nutrient content of composts.

5.14. Composts vary considerably and therefore we are proposing that the following allowance of 500 Kg/ha of compost in any two year period is restricted to 'green composts'. Green compost is most commonly made from landscaping and garden 'wastes' whereas 'green / food compost' which contain kitchen / catering 'wastes' have similar N per tonne as FYM. We propose that this rule would apply to materials with readily available N of less that 0.3 kg N/t fresh weight.

5.15. Typical nutrient content values of composts have been determined based on analysis of a large number of samples. These values are published in Defra's 'Fertiliser Manual (RB209)', published in June 2010. Values for cattle FYM and green / food compost are also shown below for comparison.

Table 2: Typical nutrient content values of composts

	Dry matter %	Total N content kg N/t fresh wt	Readily available N kg N/t fresh wt
Green compost	60	7.5	<0.2
Green/food compost	60	11	0.6
Cattle FYM – old	25	6.0	0.6

5.16. Although the total N content of green compost is similar to cattle FYM, green compost has a very low readily available N content (see Table 2) – this is the N that is potentially available for crop uptake when the compost is applied and is at risk of leaching. There is thus no significant risk of nitrate leaching following individual or repeated applications of green compost even at 'high' rates of application. Defra intend to allow application of these composts to supply up to 500 kg/ha of total N in any 2 year period.

Question 5

Do you consider the limit of 500 kg/ha of compost total N in any 2 year period is workable?

Are there any working restrictions we should consider to ensure we are not creating any unintended adverse consequences?

Organic Manure N Field Limit for composts used as a mulch

5.17. The fruit growing sector highlighted to Defra that the current NVZ Regulations with respect to the use of compost in fruit orchards are an impediment to improved production and profitability. The mandatory NVZ Organic Manure N Field Limit of 250 kg/ha of manure total N in a rolling 12 month period, was viewed as a potential impediment to improved UK top fruit production.

5.18. The use of compost as a mulch on agricultural land at application rates in excess of the current NVZ field limit of 250 kg/ha of total N represents a very low risk of nitrate leaching to water. The proven benefit of compost application to yields of some crops (e.g. fruit) due to mulching is likely to improve the uptake of soil N by the crop (and thus reduce the risk of soil N being leached). There is a reported increased yield (by nearly 50%) of apple numbers and weight, and improved soil/plant moisture supply following compost application.

5.19. Defra therefore proposes changing the Organic Manure N Field Limit for compost used as a mulch for top fruit production to 1000 kg/ha of total N in any 4 year period.

Question 6

Do you agree that a limit of 1000 kg/ha of compost total N in any 4 year period when used as a mulch for top fruit production is workable?

Do you have concerns or benefits that such a change may raise?

Derogation from the Livestock Manure N Farm Limit of 170 kg N/ha of nitrogen produced by farm livestock averaged across the agricultural area of the whole farm

In 2009, the European Commission granted Great Britain a derogation from the Livestock Manure N Farm Limit, enabling grassland farmers with grazing livestock to farm with a nitrogen loading of up to 250 kg of nitrogen per hectare per calendar year (N/ha/yr) if they submit a successful application each year and meet certain conditions aimed at reducing the levels of nitrogen and phosphorus entering waters.

Just over 400 farmers applied to use this derogation in 2011.

The Department plans to negotiate with the European Commission for a further four-year extension (until 2016). While many of the derogation conditions are likely to remain unchanged, we intend to seek to reduce some of the administrative burdens associated with the derogation (e.g. the requirement to submit Fertilisation Accounts to the Environment Agency).

Question 7

Do you consider the Department should seek to renew the Derogation?

B Closed spreading periods

Closed periods for Organic Manure

5.20. The existing Action Programme prohibits the spreading to land at certain times of the year (see table) of organic manures that have a high readily available N content (i.e. more than 30% of the total N content is in a form that can be readily taken up by the crop). These manures include slurry, poultry manure and liquid digested sewage sludge.

	Grassland	Tillage land
Sandy or shallow soils	1 Sept to 31 Dec	1 Aug to 31 Dec
All other soils	15 Oct to 15 Jan	1 Oct to 15 Jan

5.21. These periods are at times of the year when the risk of nitrate loss is high, that is in autumn and early winter. This is when leaching volumes are high, the ground is generally wet and crop growth, and therefore nitrogen uptake, is low.

5.22. There have been two developments since the above closed periods were established. These are that additional research has been undertaken and separately that the Task Force on Farming Regulation has reported.

Research

5.23. Research was undertaken by ADAS / Rothamsted Research on behalf of Defra to investigate the effect on nitrogen pollution of extending the closed period. The research has shown that the later in the winter slurry is applied, the less nitrate is lost from the soil. On sandy / shallow soils, leaching from slurry applied after mid-late January is negligible. On medium and heavy soils, leaching is considerably reduced at this time compared with slurry applied in November, for example, but still about 5-10% of what is applied can be lost to water under average rainfall conditions due to rapid drainage through soil cracks or in surface runoff. Leaching from these soils can be detectable even from slurry applied at the end of March. These results show that closed periods are important to eliminate high nitrate leaching risk situations.

5.24. In the absence of any other considerations, the evidence might suggest longer closed periods on medium and heavy soils. However it is difficult to set mandatory closed periods that eliminate the risk of leaching, yet allow practical beneficial application of manures to agricultural land. There is already a limited time in spring for the application of slurry if growing crops are not to be damaged or grass is to be suitable (uncontaminated) for grazing or silage making. Moreover, if more slurry is applied in summer, ammonia losses are likely to increase. There is therefore a balance to be struck between minimising nitrate losses by spreading manures later on the one hand and keeping ammonia losses down by spreading before it gets too warm on the other. The policy goal is to encourage manure application in spring and summer to meet the period of high crop N requirement and to achieve a more integrated approach to minimise potential pollution.

5.25. There are also further practical considerations on the question of extending closed periods. One of the most significant is the impact an extension would have if, as a consequence, a greater volume of storage was required. The Government considers it would be disproportionate to require farmers who have only recently built new stores at considerable expense to further extend their stores now. While the environmental benefit would be modest, the cost of installation would be very high.

5.26. The current storage rules were designed to ensure the farmer could always comply with closed period rules and spreading limitations rules which result in 26 weeks storage capacity for pig slurry and poultry manure and 22 weeks storage capacity for all other slurry, including cattle slurry.

5.27. We do not consider the options presented below would entail the construction of additional capacity. This is because the focus for the changes is on closed periods for soils, other than sandy and shallow soils, which currently have a shorter closed period by a month for grassland and 6 weeks for tillage land than the sandy or shallow soils. Table 3 below assists in explaining this issue.

5.28. We have presented below three possible options relating to closed periods on which your views are being sought. The research was undertaken on medium / heavy soils and the proposals have been extended for the purpose of this consultation to all soils other than sandy and shallow soils.

Option 1. Keep the existing closed periods

5.29. Advantages

- People are familiar with the existing closed periods, though for some they will only apply from 1 January 2012. This option therefore avoids change before the existing closed periods have been able to have their full impact.
- We would avoid imposing a further round of significant costs on farmers for storage construction, many of whom may have only recently built stores in good faith to meet the current rules.
- Ensures a reasonable period to get manures onto the land in spring, and so secures a balance between environmental protection and the beneficial application of manure.

5.30. Disadvantages

- Some pollution risk does occur after the end of the closed period.

Option 2. Extend the end of the closed period by 2 weeks for all soils other than sandy or shallow soils

5.31. Advantages

- The evidence shows that the pollution risk is higher on medium / heavy soils due to rapid drainage through soil cracks or in surface runoff than sandy soils and therefore this option would reduce that specific risk.
- The existing overall storage capacity still exceeds the closed period for these soils by around one month and therefore increasing the length of the closed periods by 2 weeks would mean that slurry stores currently compliant with the Directive would remain compliant.

5.32. Disadvantages

- The extension of the closed period would reduce the period available for spreading on key crops, making managing farm activities more difficult.
- The extension of the closed period would reduce the spare storage capacity for farmers to manage slurry production at the end of the closed period. If the weather was wet, or the ground took a long time to dry out, the spare storage might not be enough.

Option 3. Extend the closed period by 1 month for all soils other than sandy or shallow soils

5.33. Advantages

- The evidence shows that the pollution risk is higher on medium / heavy soils due to rapid drainage through soil cracks or in surface runoff than sandy soils and therefore this option would reduce that specific risk.

5.34. Disadvantages

- The extension of the closed period would reduce the period available for spreading on key crops, making managing farm activities more difficult.
- The extension of the closed period would leave little spare storage capacity for farmers to manage slurry production at the end of the closed period. If the weather was wet, or the ground took a long time to dry out, there would be a greater chance that spare storage capacity would not be enough.

Table 3: Summary of the closed period date options with months

Option 1 Keep as existing	**Grassland**	**months**	**Tillage land**	**months**
Sandy or shallow soils	1 Sept to 31 Dec	4	1 Aug to 31 Dec	5
All other soils	15 Oct to 15 Jan	3	1 Oct to 15 Jan	3.5

Option 2 Extend by 2 weeks for soils other than sandy or shallow	**Grassland**	**months**	**Tillage land**	**months**
Sandy or shallow soils	1 Sept to 31 Dec (SAME)	4	1 Aug to 31 Dec (SAME)	5
All other soils	15 Oct to 31 Jan (CHANGE)	3.5	1 Oct to 31 Jan (CHANGE)	4

Option 3 Extend by 1 month for soils other than sandy or shallow	**Grassland**	**months**	**Tillage land**	**months**
Sandy or shallow soils	1 Sept to 31 Dec (SAME)	4	1 Aug to 31 Dec (SAME)	5
All other soils	15 Oct to 15 February (CHANGE)	4	1 Oct to 15 February (CHANGE)	4.5

Question 8

Which of the 3 closed spreading period options do you prefer?

Do you have any comments or further evidence on any of the options that you think ministers should be aware of?

Rainfall Banding Option

5.35. The Task Force on Farming Regulation recommended revisiting closed periods to make the start and end-dates flexible, and to reflect differences in rainfall and growing season across the country. We have included below an option which goes partway towards the flexibility the Task Force was seeking. The Task Force proposal was in the context of integrating nitrate reduction with a catchment–based approach to reducing nitrate and other pollution.

5.36. Previous consultations have highlighted reservations that flexible end-dates to the closed periods are practicable. Even when weather and soil conditions mean that slurry could be applied later than now allowed in the autumn, or shortly before the end of the closed period in winter, the scientific evidence shows that there would be a high risk of its nitrogen content being leached by rain before it could be taken up by crops. This would risk harm to the environment, and would be a waste of valuable nitrogen in the manure. There is also the concern that variable ends to closed periods would be unenforceable because weather forecasts are not accurate over the necessary time period (about two weeks).

5.37. The proposal would be to bring forward the end of the closed period for sandy or shallow soils in areas with up to 750 mm average annual rainfall per year by 2 weeks (to 15 December for both grassland and arable). The intention is to reflect that in areas of less rain there is less leaching although conversely there is also less dilution. A map is included below showing the broad areas of the country within this rainfall band. The map does not show the soils criteria.

5.38. Advantages

- Seeks to reflect the influence of both rainfall and soil type on nitrate leaching.

5.39. Disadvantages

- Would raise previous concerns as to clarity and simplicity of implementation and as not being used in conjunction with soil temperatures will lead to longer closed periods in areas such as Cornwall than Northumberland.
- Could require a new rainfall area identification and appeal process solely to determine rainfall band a farm falls into. This proposal includes average (not actual) rainfall.
- Nitrate leaching is related not just to the amount of rainfall – soil temperature is also factor which influences the nitrogen utilised by the crop.

Rainfall Banding decrease closed period for rainfall banding up to 750mm on sandy or shallow soils	**Grassland**	**Tillage land**
Sandy or shallow soils	1 Sept to 15 Dec (CHANGE)	1 Aug to 15 Dec (CHANGE)
All other soils	15 Oct to 15 Jan (SAME)	1 Oct to 15 Jan (SAME)

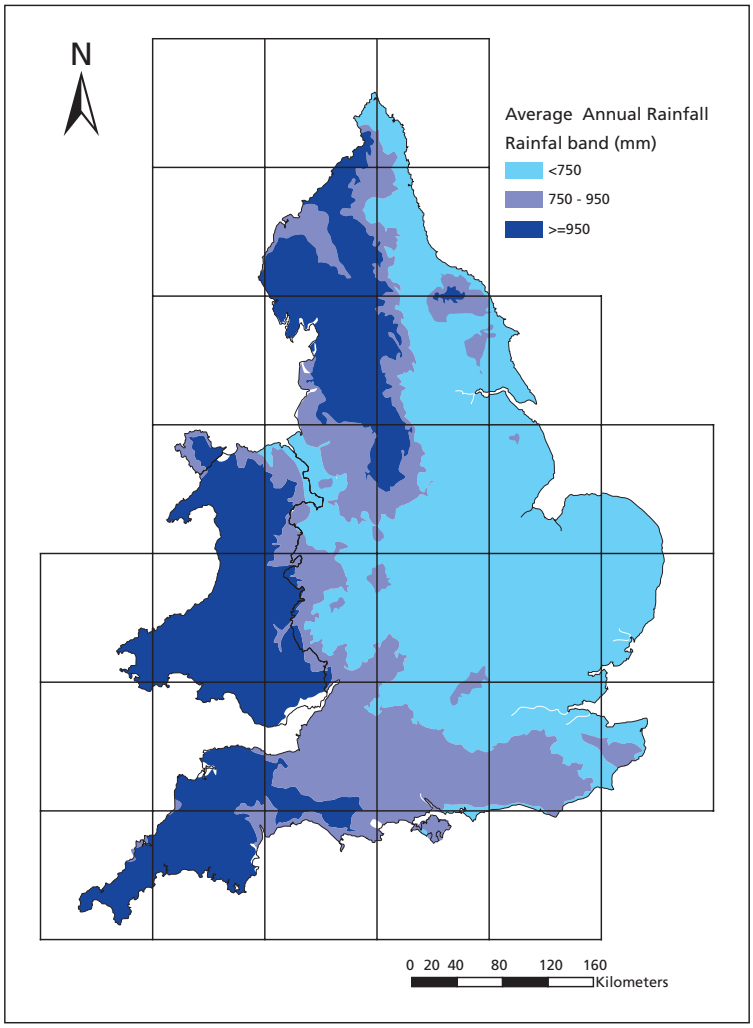


Figure 1: Rainfall banding.

Question 9

Do you support the above closed spreading period based on rainfall banding? What additional advantages or disadvantages do you see with this proposal?

Closed spreading periods for manufactured nitrogen fertilisers

5.40. As with organic manures, there are closed periods for manufactured nitrogen fertilisers that prohibit the spreading to land at times of the year when there is a high risk of nitrate loss. Manufactured nitrogen fertiliser must not be spread between the following dates except to specified crops that have a crop requirement during the closed period - We do not propose any changes to these closed periods.

Grassland	Tillage Land
15 Sept to 15 Jan	1 Sept to 15 Jan

C Restrictions on manure spreading

5.41. Research on the duration of closed periods has identified an increased risk of nitrate loss on medium / heavy soils in the period immediately following the closed period. We were already aware of this. The existing Action Programme already includes restrictions on the rate of spreading immediately following the closed period to manage this risk. Spreading of slurry between the end of the closed period and the end of February is limited to 50 m^3/ha of slurry with no repeat application within three weeks. A further way to manage the nitrate leaching risk yet allow practical beneficial application of manures, organic fertilisers and soil conditioners to agricultural land would be to reduce these rates.

5.42. This section is seeking to explore whether further restrictions on the spreading of slurry immediately afterward the closed period is a better mechanism to prevent nitrate leaching than extending the closed period.

Restrictions on manure applications after the end of the closed period

5.43. We could reduce the above spreading to 30m^3/ha of slurry with the same restrictions (see question 10 below). We would not propose any change to the limit on poultry manure.

5.44. Advantages

- We are often told of the perceived adverse impacts of 'national slurry spreading day' immediately after the end of the closed period. Reducing the volume of slurry that may be spread by many farmers in a short space of time would reduce the pollution risk presented by many farmers spreading slurry simultaneously.
- Reduces the potential for high nitrate leaching risk situations such as direct run-off of N containing material at a time of year when the soil is at or near to field capacity.
- Managing the risk of leaching in this way would enable continued application of manures to agricultural land at the start of the season and may avoid the need to extend the closed periods.

5.45. Disadvantages

- Could put pressure on existing storage capacity by restricting volume and period of spreading.

Question 10

Do you think that reducing the quantity of slurry that can be spread during and immediately after the closed period is a better mechanism for managing nitrate leaching than extending the closed periods?

If the application rate during this period were reduced, do you agree with the suggested reductions in the rate of application?

What further points should the Government take into account when considering this issue?

Applying organic manures and manufactured nitrogen fertiliser

5.46. As well as managing pollution through determining when organic manures can be spread, and at what rate, the current rules also seek to reduce pollution by saying something about the type of equipment that may be used to spread slurry. They include the requirement that organic manure must be spread in as accurate a manner as possible, using slurry spreading equipment that has a low spreading trajectory (i.e. below 4 metres from the ground unless the equipment used can achieve an average slurry application rate of not more than 2mm per hour when operating continuously). The rules also restrict the spreading of organic manures or manufactured nitrogen fertiliser close to surface water.

5.47. The purpose of these rules is to reduce harmful ammonia and odour pollution to air, to prevent spray drift (by limiting the spreading trajectory) and to ensure that there is a reasonable buffer between land where manure has been applied and watercourses.

5.48. The Government wishes to further encourage the uptake of more precise slurry spreading techniques which minimise the risk of pollution. Accurate spreading also make good business sense because it ensures crops get the full benefit from slurry applications and losses of valuable nitrogen to water and air are also minimised.

5.49. We therefore wish to recognise the different risks that broadcast and precision slurry spreaders present by allowing those using better techniques to spread closer to watercourses than at present.

5.50. The proposed amendment would allow farmers to spread organic manures to within 6 metres of surface water if using precision slurry spreaders. Otherwise the 10 metre restriction remains.

5.51. The Action Programme would also include a definition of precision slurry spreaders which would include band spreading (trailing hoses and shoes) and shallow injection.

5.52. Advantages

- This proposal would encourage accurate spreading of slurry and utilisation of slurry nutrients over a larger field area than presently allowed.
- The wider adoption of precision slurry spreaders would result in more efficient use of the nitrogen in organic manures, increasing crop yields and/or reducing the need to buy manufactured fertilisers.
- Studies of precision slurry spreading have shown they significantly reduce ammonia emissions compared with broadcast spreading.

5.53. Disadvantages

- Increased risk of pollution by placing slurry closer to watercourses.

Question 11

Do you agree with the proposals to reduce the minimum distance for spreading slurry near watercourses if a precision slurry spreader is used?

Is the proposed minimum distance from watercourses (6 metres) correct, or does it pose an unacceptable risk of pollution?

Do you have any comments on how this proposal could work or be improved?

D. Storage of Organic Manures

Calculating the capacity of storage vessels

5.54. Farms covered by NVZ rules must have enough slurry storage capacity to comply with the closed periods, and to prevent slurry having to be spread at inappropriate times. The rules are environmentally important. In calculating the required capacity we include estimated volumes of water (whether rainwater or wash waters) and other liquids that find their way into slurry stores during the autumn and winter months.

5.55. The current rules require that farms that produce livestock manure must provide the following storage capacity requirements:

- 26 weeks storage capacity for pig slurry and poultry manure
- 22 weeks storage capacity for all other slurry, including cattle slurry

We do not propose to change these rules.

5.56. As signalled at the beginning of this consultation we are also examining whether there are changes that could be made to the existing Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) Regulations 2010 (SSAFO) to make them more effective and to reduce the burden of regulation. All farmers building or substantially renovating their storage facilities, whether in Nitrate Vulnerable Zones or not, need to comply with the SSAFO Regulations.

5.57. The SSAFO Regulations require farmers building or substantially renovating stores to have at least four months' storage capacity, and have done so since 1991. The SSAFO Regulations and Nitrates Regulations have calculation method differences in the way that rain water is accounted for. The difference in the volume of storage required using the SSAFO method (based on a 1 in 5 years highest rainfall amount) and the NVZ Action Programme method (based on average rainfall) is estimated to be the equivalent of around an extra 2 weeks for cattle and an additional 6 weeks for pigs. Currently farmers in NVZs are required to calculate storage by both methods and work to the one that gives the larger volume when intending to construct new stores or undertake renovation.

5.58. To simplify compliance with both sets of Regulations, we propose standardising calculation of storage capacity on the NVZ Action Programme method for all farmers throughout England (including outside of NVZs). Note that this would not impose NVZ controls on farms outside NVZs.

5.59. The effect of the calculations of capacity through the SSAFO method or the NVZ method will vary across the country due to rainfall. However we recognise that some people outside NVZs will have built stores since 1991 that comply with the SSAFO four month requirement, but which could be smaller than the capacity calculated under the revised requirement. We propose to make a transitional provision if this is the case for those people which would mean that enforcement action would not ordinarily be taken against them solely on the basis of the volume of storage available. However, when in the future they renovate or replace their stores they would be required to comply with the results of the new calculation.

5.60. Advantages

- This proposal would give one method of calculation which would apply to determine all slurry storage capacities. It would mean that farmers in NVZs would not have to perform two different calculations, one of which would be bound to be unnecessary.
- The proposal would also make clear that in terms of slurry storage, there is very little if any difference in the treatment of farmers inside and outside NVZs (except for pig and poultry farmers, who require six months of storage).

5.61. Disadvantages

- Some farmers outside NVZs could need additional capacity when renovating or rebuilding their stores.

Question 12

Do you agree with this proposed change to the SSAFO calculation?

What other factors should ministers consider?

Storage of solid livestock manures in field heaps

5.62. In contrast to many other Member States, temporary field heaps of solid manure are an important part of farming practice in England which, if not permitted, would have a significant impact on farming operations and would incur additional storage costs for the construction of stores with an impermeable base and effluent collection facilities. The current NVZ Action Programme controls what manure types may be stored in fields, the location of these heaps and the maximum storage time. Solid manure may only be stored in temporary field heaps if it is solid enough to be stacked in a free-standing heap and does not give rise to free drainage from within the stacked material.

5.63. Since the last review of the Action Programme we have carried out research on the leaching that occurs from solid manure heaps. Leachate production volumes and nutrient losses during solid manure storage were measured from pig farmyard manure (FYM), cattle FYM and poultry manure heaps stored for a range of time periods, and from contrasting management practices, for example covered heaps. The highest total N concentrations in leachate were generally measured in the first 1-2 months from the start of leachate generation, after which only small volumes of leachate containing nitrogen at low levels were measured.

5.64. In other countries there have been concerns that leaving a field heap in situ for a year would lead to a high risk of nitrate leaching. These results show that this is not the case. Based on this scientific evidence, we intend to continue to focus control through the appropriate placement of temporary field heaps of solid manure – i.e. preventing field heaps being located on land with rapid hydrological connectivity to surface watercourse or groundwater. We intend to retain the current requirements in the Action Programme and no changes are proposed.

Question 13

Do you agree that the Action Programme does not require any amendments with respect to the storage of solid livestock manures?

E Planning Nutrient Use and Keeping Records

5.65. One of the key issues raised by the farming community through the Task Force on Farming Regulation was the extent of planning and record-keeping which is required under the Nitrates Regulations. The Task Force recommended that we significantly reduce the paperwork that goes with the Nitrates Regulations. This echoes points that have been made many times direct to officials and ministers. The Government is determined to reduce the burden of red tape, including for farmers, and we have several proposals here to do that. We wish to discuss with farming representatives and the Environment Agency through a targeted workshop during the consultation period on the following issues – nutrient management planning, reducing the burden of record keeping and removing duplication.

Nutrient Management Planning

5.66. It has long been recognised that nutrient management planning is good farming practice and the Task Force reiterated this point in its report. Good nutrient management planning enables farmers and land managers to better assess the fertiliser required for the range of crops they plan to grow, by suggesting what level of nutrients is required to provide the best financial return for the farm business. By matching nutrient supply to demand it also minimises the risk of nutrient pollution. The Government therefore wishes to encourage more farmers to adopt nutrient management as a routine part of farm and crop management.

5.67. To comply with the NVZ Action Programme, farmers are currently required to plan the application of nitrogen to crops. The Nitrates Directive does not require complicated rules but does require as a minimum the nitrogen planning process to include key steps:

- Calculate the amount of nitrogen in the soil that is likely to be available for uptake by the crop during the growing season (the soil nitrogen supply);
- Calculate the optimum amount of nitrogen that should be applied to the crop, taking into account the soil nitrogen supply (the crop nitrogen requirement);
- Calculate the amount of nitrogen from any planned applications of organic manure, that is likely to be available for crop uptake in the growing season in which it is spread (the crop available manure nitrogen); and
- Calculate the amount of manufactured nitrogen fertiliser required.

5.68. The Nitrates Directive does say that the actions set out in the Code of Good Agricultural Practice must be made compulsory in NVZs. Our Code states that you should carefully work out the amount of nitrogen fertiliser each crop needs, taking into account soil nitrogen supply, and ensure that you do not exceed the crop nitrogen requirement. As with the current Action Programme we do not propose to specify the format in which the nutrient management plan must be made and kept. In the event of a farm inspection, the farmer or land manager would be responsible for demonstrating that the planning process had been undertaken.

5.69. The Task Force also suggested that those who create full nutrient management plans (i.e. plans which deal with lime and all major nutrients), such as those created within PLANET and Tried and Tested, should be recognised for their good practice by having a reduced likelihood of inspection. This is an area we wish to discuss further with farming representatives but your views will be welcomed and you may wish to respond as part of any answer to question 14 below.

Keeping records – the general burden

5.70. In its report, the Task Force recommended reducing the burden of record-keeping to the minimum. Comprehensive record keeping has been the accepted way of demonstrating compliance to date and there is certainly scope to reduce the level of detail set out in the Regulations.

5.71. As with the proposals on nutrient management planning, the advice in the Code of Good Agricultural Practice is the minimum that we must require of farmers under the terms of the Directive. This is a straightforward need to keep accurate records of the application of nitrogen-containing materials to crops.

5.72. Farmers still need to comply with the main elements of the Directive and Regulations, such as the relevant organic manure storage requirements, the Organic Manure N Field Limit (250kg/ha/year), the Livestock Manure N Farm Limit (170kg/ha/year) and Nmax (the total amount of crop available nitrogen that can be applied to any one crop type).

5.73. A further area we wish to discuss and on which we wish to receive your views is whether to exempt areas where the cost of compliance would be disproportionately burdensome. For example, farms could be exempted on the basis of small size (as done by a number of other Member States) or type (e.g. extensive hill grazing where N leaching, ammonia and nitrous oxide emissions are generally very low), or using other categories such as the Less Favoured Areas or through the definition of 'Spare time farm'.

5.74 The aim would be to avoid action on farms where the cost would be disproportionately burdensome and the impact on other nitrogenous pollutants would be likely to be small.

5.75. On very small farms, the burden of regulation may be excessive compared to the environmental benefit that is achieved. Determining the threshold of regulation and environmental protection is crucial. Small farms are common, but represent a small fraction of the total agricultural industry or land area.

5.76 There are various definitions of small farms including the definition of a 'spare time farm' in the Farm Business Survey which is a farm with less than half a standard labour requirement, that is less than 50 ha cereals, less than 25 dairy cows or less than 200 ewes. Of the 130,000 currently recorded farms in England (within NVZs) around 50% are below this thresholds.

5.77. Another option would be to explore using EU thresholds which relate to area for cereals (less than 5 hectares) and animal numbers for dairy, beef, pigs and poultry (10, 10, 10 and 1000 head respectively). Use of the EU thresholds would eliminate only a small proportion of the arable cropping area and livestock from the NVZ regulations. It would however eliminate a significant number of holdings from the administrative reporting burden of the NVZ Action Programme. Other aspects of the Action Programme would still have to be complied with.

5.78. It may be that a combined threshold is required, to deal with mixed enterprises which are below the chosen criteria in all of the categories, but represent significant numbers in total. This complexity is less likely to be required with the EU thresholds, which are already very low.

5.79 Overall, these data indicate that a threshold farm size for implementation of the NVZ Action Programme is desirable both for the industry and for Government, to improve the ratio between administrative burden and environmental benefit.

Question 14

Do you have ideas that will reduce the burden of record keeping while maintaining environmental protection?

Are there any situations where we should not reduce record-keeping?

Keeping records – removing duplication

5.80. The Task Force also suggested that there are instances where records required by one set of rules are pointless in the context of another. The example the Task Force highlighted was organic farming, where it reported that many requirements in the Nitrates Regulations were inappropriate for organic farmers. This is because their farming system means that they pose a lower risk of causing nitrate pollution through lower fertilisation rates and not using artificial fertilisers. The organic farming rules require them to keep records to prove compliance with that scheme which can also show compliance with the NVZ rules, and those records are checked by the organic farming certification bodies. The Task Force took the view that this should earn organic farmers the recognition that the assurances provided by farming to the organic standards and the systems in place to check compliance were sufficient also to provide assurance of compliance with the Nitrates Regulations. We are working to check the details during the period of this consultation. Provided our analysis shows that the organic standard does provide the assurances the Government needs, we propose to exempt certified organic farms from separate record-keeping requirements.

5.81. The Task Force suggested that there were also other low intensity farming systems to which this principle of earned recognition could be applied. The examples it gave were conservation grade farming, low intensity beef farming and hill farming. The Government is interested in this suggestion. To apply the same principles, we would need to be confident that compliance with the rules of any assurance scheme, farming standard or other agreement meant either:

- that the record-keeping required by the assurance scheme would show compliance with the Nitrates Regulations, or
- that the application of fertilisers was at a level low enough to ensure compliance with the Nitrates Regulations.

5.82. Where assurance might be provided by accredited private sector or third-party audit, arrangements would need to be agreed / in place that any premises not meeting the requirements of the scheme relevant to the Nitrates Regulations would not retain accreditation without correcting those deficiencies.

5.83. There is also a question of how we should define "low intensity". One possibility is to relate the level of nitrogen applications to the anticipated crop nitrogen requirement for maximum economic production. We could, for example, define low intensity farming systems as ones in which less than 50% of the Nmax limit is applied (NB 50% is used here purely for illustration purposes, it is not a proposal). We have in mind the farming systems where the impact of the raising of animals or the growing of crops is well below the ability of the land to absorb that impact. In other words we can be confident because of the farming system being used, there will be no significant risk of nitrate pollution.

Question 15

What low intensity farming systems do you consider should not have to keep Nitrates Regulations records? We would be interested to discuss suggestions with those responsible for running such schemes.

Should "low intensity" be defined in terms of the Nmax limit, manure nitrogen loadings, or both? Or should other factors be part of the definition (and if so, what are they)? For your preferred way of defining "low intensity", what level(s) of the relevant measures would be appropriate?

F. Cover crops

5.84. The Nitrates Directive does not explicitly require cover crops to be included in the Action Programme – they are included in the Directive as an optional measure. A number of other Member States do make use of cover crops, and they are currently under consideration as a measure for greening the Common Agricultural Policy.

5.85. The Government consulted on the use of cover crops throughout NVZs in 2007 but consultees rejected the idea, and ministers agreed. At that stage, the proposed use of cover crops was considered too broad-ranging. However, the available evidence indicates that used in the right way they can be a significant and cost-effective measure for tackling diffuse water pollution from arable land. Research carried out by ADAS showed that the presence of cover crops reduced the concentration of nitrate in leachate by about 25% on farmland where manure was not part of the crop rotation. Where manure was included in the rotation, this effect was greater – about a 40% reduction. We are only proposing the use of cover crops in certain circumstances and therefore the overall benefit of reduced leaching to groundwater would be lower. Allowing volunteers and natural regrowth, plus where necessary sowing other crops to establish a cover following harvest, was as effective in reducing nitrate leaching as purpose sown cover (such as stubble turnips). In practice, therefore, it would be possible to minimise cost by using minimum tillage methods, cheap seed and, where appropriate, using the crop for grazing. The indicative NVZ maps in Annex 2 highlight the ground water NVZs, and sandy soils are as currently defined in the existing regulations.

5.86. In light of the evidence outlined above, we are considering including cover crops in the Action Programme. We recognise that cover crops would not suit all soils and farming systems. In general, it is where soils are lighter that spring crops are favoured, and therefore where the soil will be bare over the winter. A further consideration in the assessment of cost-effectiveness is securing secondary benefits. As the cost of removing nitrate from drinking water is high, preventing nitrate leaching into drinking water sources (mainly groundwater) is particularly cost-effective.

5.87. Our proposal would be to introduce a requirement to ensure that cover crops on sandy soils were established in those areas designated as groundwater NVZs, where the ground would otherwise be left bare over winter. You would be required to establish or maintain a cover crop if the land would otherwise be bare between 1st September and 15th January (i.e. crop harvested before 1st Sept and following crop not sown/planted until after 15th Jan). In such cases the cover crop would have to be sown (or achieved in part through volunteers) by 15th September and not destroyed until after 15th December.

5.88. Advantages

- The available evidence suggests that the use of cover crops under these circumstances would take up significant quantities of nitrate over the autumn and winter period and thereby reduce leaching into groundwater.
- This would be a cost-effective measure to reduce nitrate pollution from arable land.
- The presence of a crop would also help reduce soil erosion.
- Crops such as stubble turnips could also feed livestock.

5.89. Disadvantages

- The presence of a cover crop could interfere with operations such as de-stoning of potato land, and preparation of a quality seedbed could be difficult in wet years.

Question 16

Do you think cover crops should be included in the Action Programme?

If so, have we identified the correct circumstances (sandy soils over groundwater) for their use?

Are the suggested dates appropriate? If not, what dates would you suggest?

What actions do you consider should be defined to show compliance?

6. Proposals on the Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (England) Regulations 2010

6.1. The Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (England) Regulations 2010, as amended, (SSAFO) lay down the construction standards and specifications for stores of these materials. Both the Nitrates Regulations and the SSAFO Regulations have the same aim, reducing the risk of water pollution, and both set out rules about slurry storage. Given the overlap in policy objectives, we intend to merge the Nitrates Regulations and aspects of the SSAFO Regulations into one statutory instrument.

6.2. In doing so, we have only undertaken a selective review and the existing rules on silage and fuel oils will remain unchanged, and also the technical standards set out in the schedules to the SSAFO Regulations. It is intended that suggested changes would become part of the same statutory instrument as the Nitrates Regulations. As now, they would apply throughout the whole of England – their application would not be confined to discrete NVZs (if that is the way we choose to implement the Nitrates Directive).

6.3. However, the Nitrates and SSAFO Regulations are inconsistent in some respects, such as in the way the calculation of the volume of slurry storage required must be done. So we intend to take the opportunity to simplify the Regulations by removing some of these anomalies. In addition to the earlier section on storage calculations we have two further proposals on which we are consulting.

Regulation 6 exemption

6.4. The SSAFO Regulations were introduced to provide a minimum standard of safety for people in the farmyard and the environment, which is why they set construction standards and a minimum volume of storage for slurry.

6.5. In introducing the regulations over 20 years ago, the Government also introduced an exemption to avoid requiring farmers who had invested in new infrastructure prior to the regulations having to make costly alterations for minimal environmental benefit. This was achieved through Regulation 6 of SSAFO, which says that the Regulations do not apply to slurry stores built before 1 March 1991, or stores for which irreversible commitments had been made by that date – such as contracts agreed for construction. Such stores were therefore not necessarily built to the specification set out in the Regulations, and may be smaller than the capacity required for stores to which the Regulations do apply.

6.6. By the time the revised Nitrates Regulations come into force, the SSAFO storage capacity and construction standard will be almost 22 years old. Stores benefitting from the exemption will, apart from those under construction when the rule entered into force, be older. As such, they will be nearing or at the end of their useful lives, and the risk of pollution from ongoing leaks or catastrophic failure will be increasing significantly.

6.7. We have anecdotal evidence that the exemption is now acting as a perverse incentive in some cases: some farmers are avoiding refurbishing or replacing stores that they know have reached the end of their lives because doing so would mean that they would have to build a larger store. So the Regulations designed to protect safety and the environment are now, in some circumstances, encouraging people to take increased risks with safety and the environment.

6.8. We consider that the public has a reasonable expectation, over two decades after the rules were first introduced, that all stores should now comply with the standards set out in the Regulations. Similar arguments apply in the case of silos and fuel storage tanks. We therefore propose to remove this exemption.

6.9. The Regulations will generally enter into force on 1 January 2013. To allow a reasonable time for business planning and adjustment, we propose that the exemption will be repealed from 22 December 2015. This coincides with the start of the second period of action under the Water Framework Directive, and would provide almost another 3 years for the exemption to run, meaning that stores to which the exemption then applied would be nearly 25 years old.

6.10. Alternatively, we could maintain the exemption. There would be no direct costs to farmers because there would be no new requirement. However, as existing stores get older and not all of them are replaced, there is likely to be a number of avoidable failures of stores resulting in adverse impacts on the environment and costly work at public expense to clear up the pollution and possibly investigate and prosecute.

Question 17

Do you agree that the exemption in Regulation 6 should be repealed?

Do you think the deadline for doing so (22 December 2015) is the right one?

Notification of storage

6.11. Regulation 9 requires farmers to notify the Environment Agency at least 14 days before material is first stored in a new or refurbished store. The purpose of this rule is to give the enforcement authority the opportunity to inspect the store and assure itself that it complies with the Regulations.

6.12. We consider that this is not an effective rule. If a store had been built which did not conform to the standards then enforcement of the rules at that stage would involve considerable expense for the farmer (to make amends) that could have been avoided by earlier intervention. If there were any doubts about compliance, there would therefore also be an incentive not to comply with the requirement to inform the EA.

6.13. We propose that during the planning phase of a new store (i.e. before irreversible decisions about site and construction method have been made) a farmer should be required to inform the EA

- of the intended construction or renovation of the store,
- its intended purpose,
- its capacity,
- its location, and
- that construction will meet the SSAFO standards

Not to notify the EA would be an offence.

6.14. Consistent with the recommendations of the Task Force on Farming Regulation, it would be assumed that a person constructing a store would select the site consistent with the Regulations and ensure that construction met the appropriate standards and volume. Notification to the EA would enable it to inspect the proposed site and to raise concerns if it had any. A lack of objections or concerns from the EA could not be taken as signalling its approval, but neither would it result in any delay as the notification process would not put a hold on development. If the store was not located in accordance with the Regulations or was badly constructed, the EA would be able to make use of the full range of enforcement options to address the situation.

6.15. We consider that the immediate burden of this proposal on farmers would be neutral as its effect would merely be to change the timing of a notification to the EA. However, by enabling potential problems to be highlighted and addressed early, it could potentially provide significant savings for anyone who would otherwise have built a non-compliant store.

6.16. The alternative is not to make this change. Also cost-neutral in the short term, this option may result in the construction of non-compliant stores resulting in increased environmental risk and costs to farmers to correct defects.

Question 18

Do you agree that a person constructing a store should notify the EA of his/her intention to do so before firmly committing to the project?

How might we improve this provision?

7. Next steps

7.1. Your responses to this consultation will enable the Government to firm up on the intended way ahead for the next 4 year period of the Action Programme. The Regulations giving effect to the revised NVZs and Action Programme are anticipated to come into force on 1 January 2013. In previous reviews we have recognised that a number of farmers will not be able to comply with some of the proposed measures straight away. We do recognise that slurry storage facilities and the amendment of the manure N efficiency standard values may require further consideration of the timeline to phase in implementations.

Question 19
Do you consider all the measures should be implemented from 1 January 2013?

7.2. To ensure that farmers are aware of, understand, and are able to fulfil their obligations under the proposed Action Programme, we will continue to identify effective mechanisms to provide advice and guidance.

Annex 1: Requirements of the Nitrates Directive – indicating table of changes from current Action Programme

	EU Requirement	Existing Action Plan	Consultation Action Programme	Comments
Article 5	Action programme may relate to all vulnerable zones…or…different programmes may be established for different vulnerable zones or parts of zones	We have One universal Action Programme in the NVZ	Maintain one universal action programme EXCEPT Differing closed periods based on rainfall have been included for consultation	Clarity, universally applied, easier to monitor. Differing action programme not viewed as a priority. Potentially additional complication as more boundary discussions as to which rain band
Article 4	Establish code of good agricultural practice covering at least Annex II – voluntary basis	Code established	No change	Voluntary basis -Code updated in 2009
	Set up provision of training and information for promoting code	Guidance published	Guidance will be updated but not at consultation stage	
Article 5	Additional measures in the light of experience in implementing action programmes	These have been developed through previous action programmes	Cover crops – proposals have been included on the establishment of cover crop for particular soils over winter	Keeps relevance, ensures an evidence based approach to policy making
Annex III 2	For each farm or livestock unit the amount of livestock manure applied to the land, including by the animals themselves, shall not exceed a specified amount per hectare…. the amount of manure containing 170 Kg N	Livestock manure N farm limit: Establishes a loading limit of 170 kg/ha of total N from livestock manures (deposited during grazing and by spreading) per calendar year, averaged across the farmed area. Must ensure that in any 12 month period the total amount of nitrogen in organic manure spread on any given hectare on the holding does not exceed 250Kg	Organic Manure N Field Limit will remain at 250kg/ha of total manure N in any 12 month period, the Livestock Manure N Farm Limit will remain at 170kg/ha/calendar year and the Nmax limits for individual crop types will also be unchanged. However, we do propose some technical changes.	Would continue to explore in consultation extending the derogation limit for a further 4 years from 170 Kg N per annum to 250 Kg N/ha
	Member states may calculate the amounts referred to (above) on the basis of animal numbers	Calculation and guidance provided. Established standard figures of N from livestock manure and manufactured fertilisers for certain crops	Consultation includes proposals for one off calculation to identify requirement of Annex iii 2 to identify low risk farming where annual records, or extended records, would not be required.	Less bureaucratic and les burden on farmers – however less ability to show compliance. Being considered on basis of minimising record keeping
Annex III 1.1	Periods when the land application of certain types of fertiliser is prohibited	Closed period (manufactured nitrogen fertilisers): Prohibits the spreading of manufactured nitrogen fertiliser during specified periods unless there is a crop nitrogen requirement. Closed period (organic manures): Prohibits the spreading of organic manures with high available nitrogen content (e.g. slurry, poultry manure) during specified periods.	No change for manufactured nitrogen fertiliser. Consultation includes 3 options on the closed period for organic manures. Consultation also includes option on amending closed period relative to rainfall banding.	Complies with an Evidence based policy. Research has identified the existing storage period is justified for sand and shallow and is less clear cut for other soils

	EU Requirement	Existing Action Plan	Consultation Action Programme	Comments
Annex III 1.2	The capacity of storage vessels for livestock manure – must exceed that required for storage throughout the longest period during which land application is prohibited – except where demonstrated excess will be disposed of in manner which will not cause harm to the environment.	Manure storage capacity: Requires farms to provide sufficient storage facilities to store all slurry produced by livestock during a period of 6 months for pigs and 5 months for cattle, and to store all poultry manure produced during a period of 6 months.	Keep as existing – we do however propose that the Silage and slurry storage and fuel oil regulations are amended to comply with the Nitrates calculations. This would therefore provide one consistent set of regulations. Additional field research and evidence has been used to consider the field storage of FYM (no change)	For some may impose additional financial burdens on farmers but not common effect.
Annex III 1.3	Limitations of the land application of fertilisers, consistent with good agricultural practice and taking into account the characteristics of the vulnerable zone concerned, in particular a) Soil conditions, soil type and slope. b) Climatic conditions, rainfall and irrigation Land use and agricultural practices, including crop rotation systems: c) and to be based on a balance between i) the foreseeable nitrogen requirements of the crops and ii) the nitrogen supply to the crops from the soil and from fertilisation corresponding to; the amount of nitrogen present in the soil at the moment when the crop starts to use it to a significant degrees (outstanding amounts at the end of winter) the supply of nitrogen through the net mineralization of the reserves of organic nitrogen in the soil Additions of nitrogen compounds from livestock manure	Spreading techniques: Prohibits the use of high trajectory application techniques for spreading slurry. Additionally, applications of organic manure to bare soil or stubble will require incorporation into the soil in certain situations. Includes phasing the spreading during the open period. Risk maps – occupier who spreads organic manure must produce map (risk map) and keep a copy Spreading locations: Requires farmers to undertake a written assessment to identify areas of land at risk of runoff and causing water pollution. Applications of nitrogen fertiliser and organic manures to areas of land identified as posing a high risk of runoff are prohibited. Must first inspect to consider risk getting into water, taking into account slope, any ground cover, proximity of surface water, weather conditions, soil type and presence of land drains. Cannot spread if soil is waterlogged, flooded or snow covered or has been frozen for more than 12 hours in previous 24 hours Calculate the amount of nitrogen in the soil that is likely to be available for uptake by the crop during the growing season (the soil nitrogen supply) Calculate optimum nitrogen to be spread on the crop taking into account nitrogen available from soil nitrogen supply	Consultation includes option for precision spreading closer to watercourses. Still includes phasing the spreading during the open period but seeks to reduce the quantity immediately following the closed period until the end of February from 50m^3/ha to no more than a maximum of 30m^3/ha of slurry in a single application. Propose keep map but not written assessment – need to demonstrate that the farmer has undertaken the necessary risk assessment (to identify areas of the farm suitable for spreading). Otherwise no change Generally maintain same approach; N efficiency figures amended following research. Nutrient planning remains key measure. Focus on reducing record keeping for low input farming and / or certified assurance schemes etc. to avoid duplication of record keeping. Also have included options to assist the application of composts as a mulch.	Based on research and seeking to encourage further the use of injectors and trailing shoes for slurry application. This approach should retain flexibility for farmers to spread early in the Spring, but reduce the volume of N applied to land (and therefore available for leaching) Links to Code – By considering slope, soil type and the position of surface waters and water supplies, you should identify fields or parts of fields where livestock manures and dirty water should never be spread. These non-spreading areas should be marked on a farm map (in red). Research and evidence based together with reducing reporting burden on farmers

	EU Requirement	Existing Action Plan	Consultation Action Programme	Comments
Annex III 1.3 (Cont…)	Additions of nitrogen compounds from chemical and other fertilisers.	Produce a plan for the spreading of nitrogen fertiliser for that growing season Must be calculated (other than grass) before spreading any N – for grass must do this each year beginning 1st January Plan must be permanent, record field, area planted or intended to be planted, type of crop, soil type, previous crop, soil nitrogen supply, anticipated month crop planted, anticipated yield, the optimum amount of nitrogen that should be spread. Additional information is to be recorded Cannot spread manufactured fertiliser within 2 meters of watercourse Cannot spread organic manure within 10 metres of surface water or within 50 metres of borehole spring or well	Propose to reduce 10m metres barrier to 6 metre from surface water if undertaken with precision equipment	
		Crop requirement: Requires farmers to plan their applications of nitrogen to crops and to comply with an upper cap on nitrogen applications (N max limits). Occupier must establish total Nitrogen in the manure – standard table or sampling and analysis and then uses efficiency percentages to establish amount of N available for crop uptake in growing season	N max figures not changed but the N efficiency figures have been amended -Research shows these figures should be altered which should lead to better methods of application. Consultation also includes the inclusion of all organic manures to apply towards N max.	Research and evidence based approach.
		Record-keeping: Establishes a requirement to keep a record of all N applications to land to facilitate compliance checking, and all to keep records of livestock numbers kept on the holding.	Consultation includes shift in part in record keeping requirements.	Several suggestions included in consultation as to reducing record keeping.

Annex 2: Description of the methodology for identifying individual NVZs

1. The areas recommended for designation under Option 1 are in line with the criteria set out in the Nitrates Directive, that is land draining to and contributing to the pollution of a "polluted" water, specifically:

- a **surface water** which has, or could have if action is not taken, a nitrate concentration greater than 50 mg per litre
- a **groundwater** which has, or could have if action is not taken, a nitrate concentration greater than 50 mg per litre
- a surface water which is **eutrophic,** or in the near future may become eutrophic if action is not taken.

2. This consultation includes maps of sufficient clarity to indicate the NVZs compared with existing designations and whether additional areas are identified or deleted. These maps are therefore an indication as to the possible extent of the NVZs – they are not accurate at field level and revised water data will be available later in the year to refine the maps.

3. When the Government response is published, expected April 2012, if Option 1 is determined as the appropriate way ahead then firm boundaries will be presented in the Environment Agency's recommendations. These will be full interactive maps available on the website as part of the Government's response and can be used to determine whether individual parcels of land would fall within an NVZ under Option 1, and also the reason for its potential designation.

4. For information we have shown below on separate maps the extent and any potential changes of groundwater NVZs, the extent and any potential changes of surface water NVZs, and the extent and any potential changes of eutrophic NVZs. The fourth map combines these areas (areas are designated under differing methodologies but the same area can be included under more than one designation method). The fifth map highlights the areas of change, including both additions and deletions from the previous designation.

Methodology

5. The methods developed on behalf of Defra by the Environment Agency are similar to the methodology used to identify the NVZs designated in 2008 but have been reviewed in detail during 2010 and 2011 by the Environment Agency, advised by a Defra Steering Group which included Government officials, stakeholders and independent academic experts.. This 'Methodology Working Group' has been able to learn from the previous designation, and inform and challenge the development of the process. We consider the use of the peer review process has improved the level of transparency of an otherwise very technical process.

6. The membership of the Methodology Working Group was;

Defra	Simon Crabbe, Alex Bowness, Alan D'Arcy
Welsh Government	James Dowling, Tamlyn Rabey
Environment Agency	Robert Willows, Alwyn Hart, Simon Leaf, Nigel Crane, Ian Davey
Environment Agency (Wales)	Clare Blacklidge
WRc (Consultants for EA)	Andy Davey, Rob Moore
Natural England	Lindsey Stewart (later Alastair Burn)

Independent Experts;

David Lerner(University of Sheffield)

Adrian Butler (Imperial College)

Anne Williams (British Geological Society)

Kevin Hiscock (University of East Anglia)

Stephen Maberly (Centre for Ecology and Hydrology)

Stakeholders

Michael Payne, National Farmers Union

Derek Holliday, CLA

Dafydd Jarrett, NFU Cymru

Rhian Nowell-Phillips, Farmers Union Wales

Sara Crocombe, Tenant Farmers Association

Tristan Hatton-Ellis, Countryside Council for Wales

Luke de Vial, Wessex Water (for Water UK)

7. The methodology used represents a robust and practical approach to the identification of polluted waters and NVZs, consistent with assessment approaches adopted for the Water Framework Directive (2000/60/EC) requirements and Groundwater protection. It makes use of all the available data, up to 20 years' worth of monitoring in some cases. The following are summaries of the 3 methodologies agreed in principle by the Methodology Working group on the 16 November 2011. The full methodologies will be published on the Defra website early in 2012.

Surface Water Methodology

8. Surface waters affected by nitrate pollution were identified using a series of steps. These include dividing the country into a large number of surface water catchments in which all watercourses are deemed to be 'surface water'. The next step was analysing water quality monitoring data to find out whether the nitrate levels in the surface water were above 50mg/l. In parallel to this exercise a modelling assessment of nitrate pollution in surface waters was undertaken which provides an additional assessment of the risk of nitrate pollution based on how the land is used. The combination of the results of these two methods provided an initial determination of whether the surface water was polluted. Workshops were then held allowing local EA staff to comment on these preliminary results of the assessment and to highlight, for example, where others sources of pollution may have been the reason for high nitrate levels. The workshops were attended by observers from external stakeholder groups. The next and final stages were to check the land that drains to the 'polluted' waters.

9. Figure 2 below shows the land identified as draining to polluted surface water. Surface water NVZs would cover 50.1% of England, compared with 48.1% (for surface waters only) in the 2008 round of designations. For surface water NVZs there have been small areas removed and other areas added as shown on the indicative map. Note that some of this land may remain designated because of polluted groundwater or eutrophication and therefore the percentage figures of the three indicative maps are not cumulative.

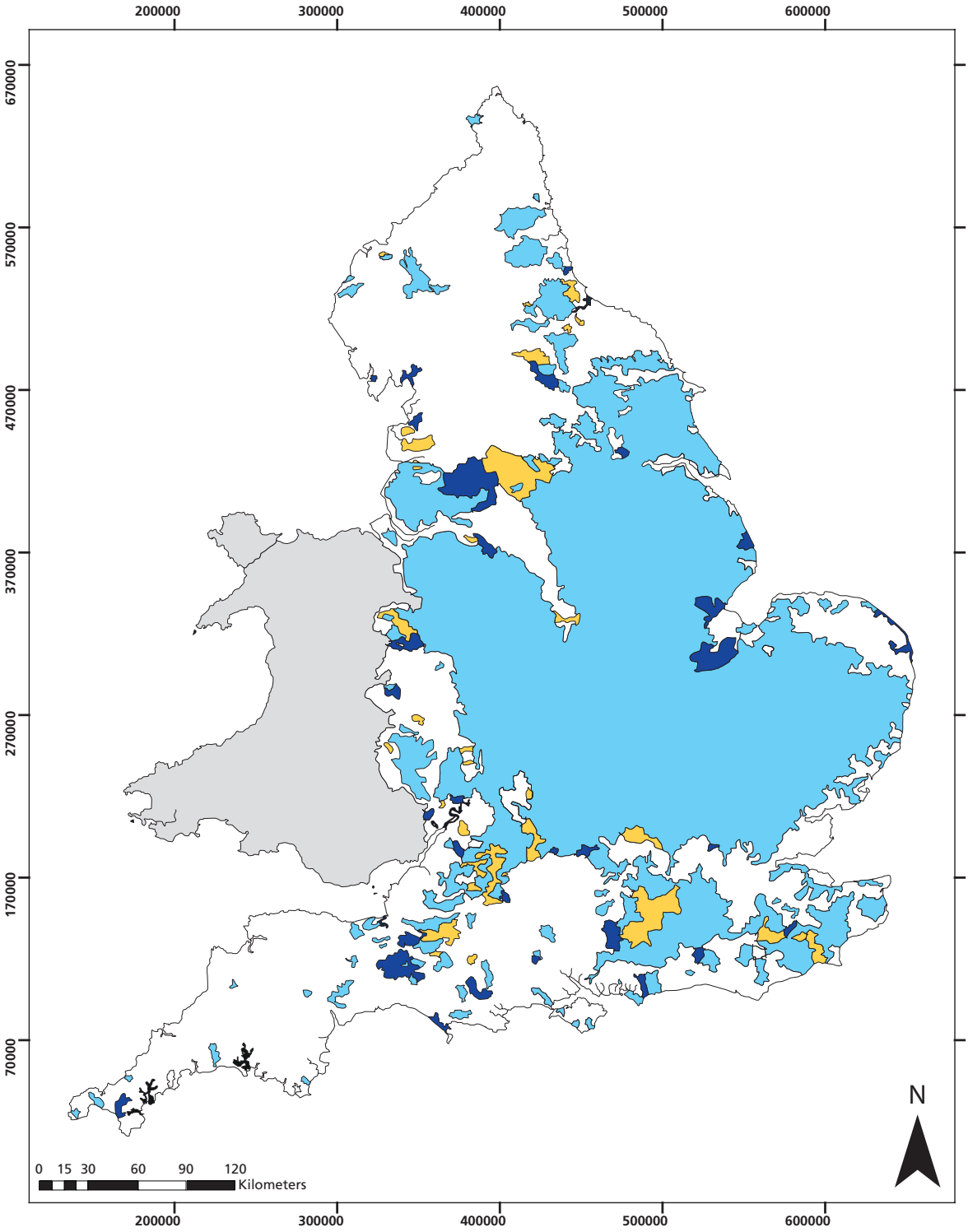


Figure 2: Indicative Surface Water NVZ Designation

10. Note that due to the incorporation later this year of a new, more accurate data set describing where land drains to, the recommendations as to these boundaries are subject to change. They are not intended to be definitive at this stage, but rather to give a good overall picture of the extent of likely recommendations as to designations based on the water quality analysis we have carried out.

Groundwater Methodology

11. Most of England and Wales is underlain by groundwater in aquifers. Water quality monitoring data was analysed to determine the mean nitrate concentration in mid 2010 and the predicted mean nitrate concentration in 2025 to determine if the water was, or was likely to become, polluted. If the mean current or predicted nitrate concentration of a groundwater exceeds 50mg/l, it is deemed to be polluted. The area of the 'failed' groundwater is then determined. In parallel, as for surface water, an assessment of nitrate leaching to groundwater using land use data was modelled. The outputs of these 2 methods were combined to provide an initial assessment of whether a ground water was polluted, and the confidence of that conclusion. As for surface water, to incorporate local knowledge and understanding, the results were reviewed and modified where necessary by groundwater quality teams within the Environment Agency at local workshops, which were attended by observers from external stakeholder groups.

12. Land that is directly above a polluted groundwater does not necessarily drain into it and therefore the final stage was to use geology and other hydrogeological features such as surface water outflows and groundwater flow lines to delineate the catchments of the 'polluted' groundwater.

13. Figure 3 below shows the land identified as draining to polluted groundwater. Groundwater NVZs would cover 25% of England, compared with 24.4% in the 2008 round of designations.

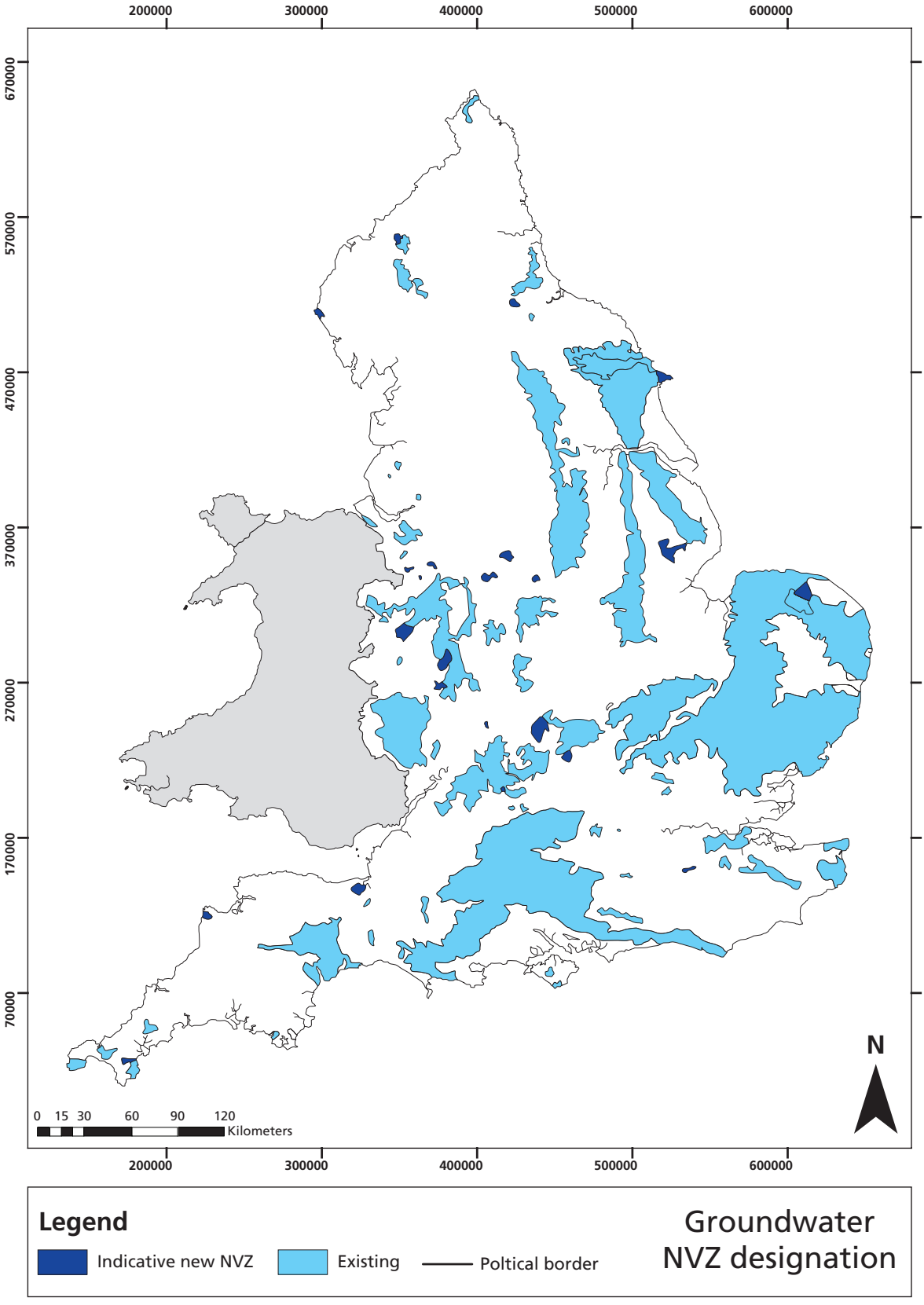


Figure 3: Indicative Groundwater Water NVZ Designation

Methodology for eutrophic waters

14. Assessing eutrophication is complex. It describes a process of change rather than a state. It is not possible to assess whether a water is, or may become, eutrophic simply by reference to a single numeric threshold such as a nitrate concentration. Whether a water is eutrophic depends on a large number of variables in addition to the concentration of nutrients. It is necessary to consider the current condition of the water body, including its ecology, and whether undesirable effects and the growth of algae or plants are due to nitrogen inputs. As with the surface and groundwater assessments, we are also required to consider whether such effects may occur if preventative action is not taken. All these elements are included in the methodology and conclusions reached based on the weight of the evidence of eutrophication.

15. A number of lakes and transitional waters which warranted detailed investigation were identified. Criteria have been established for the relevant water types to decide whether waters are affected by eutrophication. For the Nitrates Directive, the Environment Agency identified polluted waters if sufficient nitrate was present to promote eutrophication and the elevated nutrient concentrations were having an adverse impact on the plant life in the waters. Information on the impact on water quality and use (e.g. recreation or conservation value) was also considered. Therefore a number of factors were considered in order to come to a rounded judgement, taking into account the weight of evidence, as to whether an individual water was suffering an "undesirable disturbance" or might do so without preventative action. Having identified candidate eutrophic water bodies the Environment Agency convened a national panel of its own and external experts to ensure consistency in application of the assessment procedure. External, academic experts were included on the panel because of the greater degree of expert judgement that this methodology requires (compared with the surface and groundwater processes). Observers from stakeholder groups also attended the panel meetings. The final stage was that the land draining to these surface waters was identified.

16. Figure 4 below shows the land identified as draining to eutrophic water. Eutrophic NVZs would cover 5.1% of England, compared with 4.6% in the 2008 round of designations. This increase in area reflects the inclusion for consideration of a larger number of water bodies, resulting from work done since the 2008 designations on implementing the Water Framework Directive. It does not necessarily mean that there are more waters in England where nitrate was responsible for eutrophication than in the past.

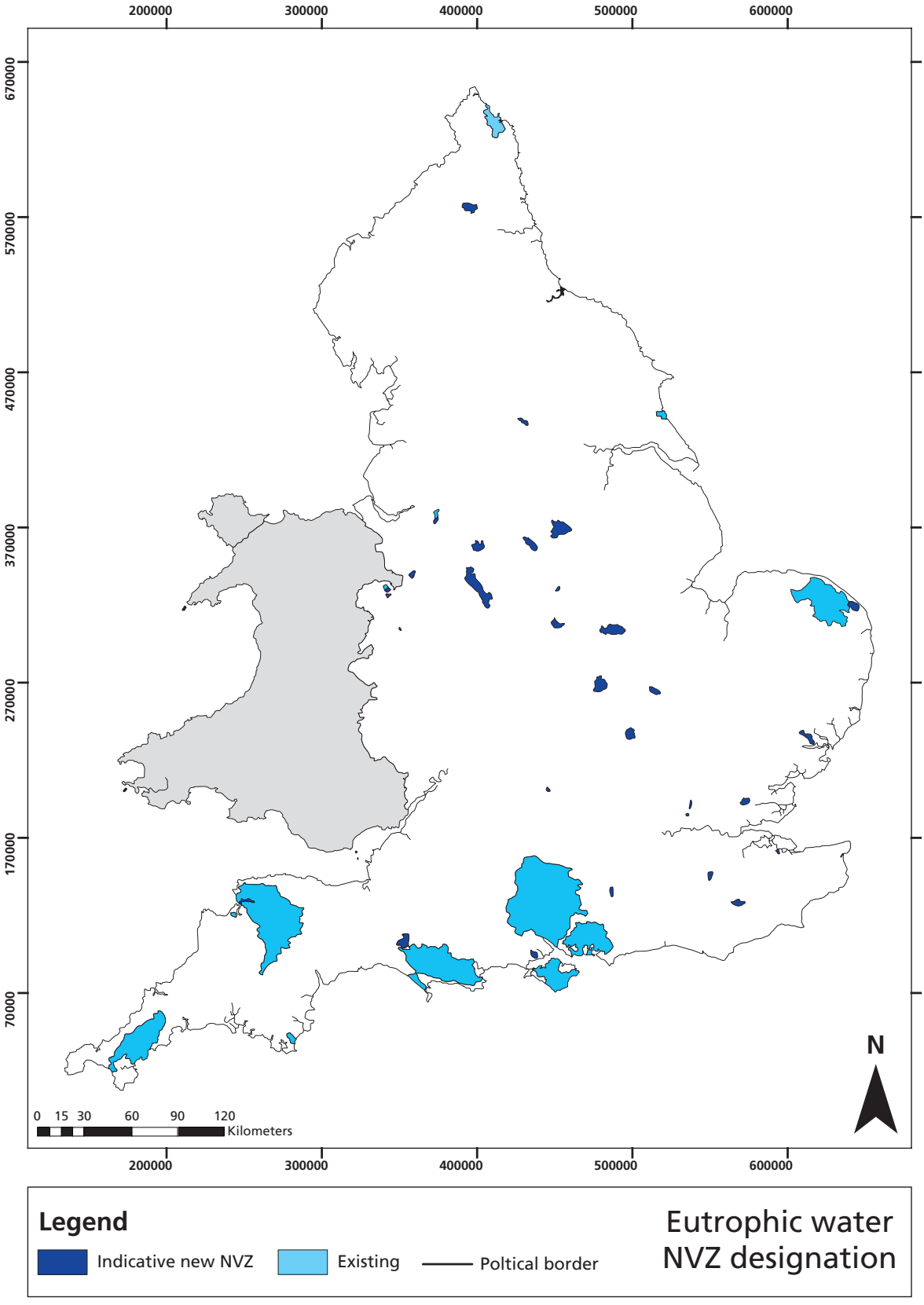


Figure 4: Indicative Eutrophic Water NVZ Designation

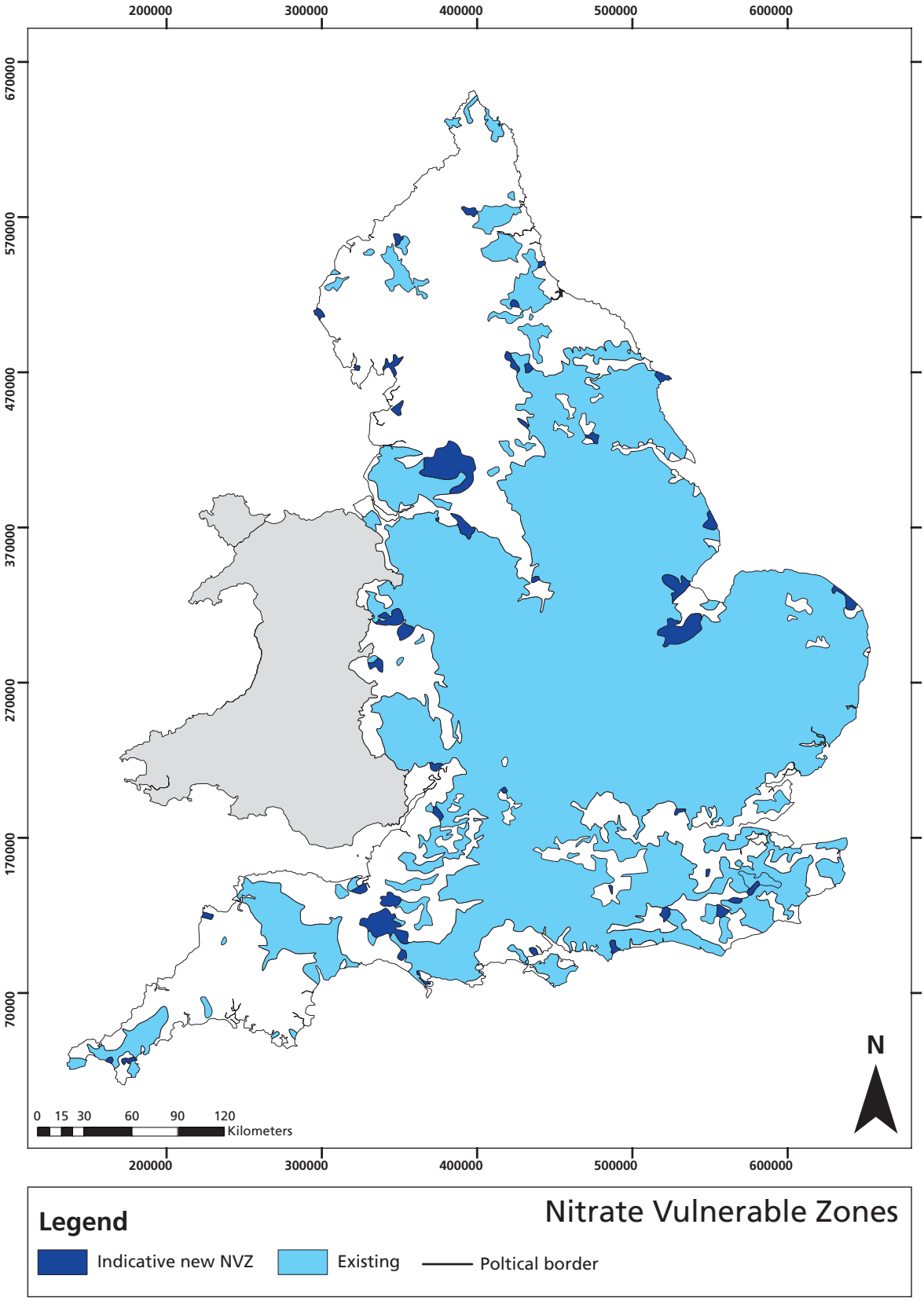


Figure 5: Indicative Combined NVZ Designation

17. Figure 5 combines the three individual maps. It shows all three classifications of NVZ, overlapping where this occurs. In total, taking account of the overlaps, about 61.5% of England would be indicative NVZs using this methodology. This compares with 68% that was identified for designation under the previous methodology, and the 62% which is the current NVZ designated area following the consideration of appeals. The indicative NVZ figure of 61.5% may slightly rise or fall as new water catchment boundaries and as the indicative boundaries are firmed up with field boundaries or other features over the next few months.

18. Figure 6 below highlights the areas of change; indicative new NVZs, and also those areas which would no longer be designated.

19. Under Option 1 NVZs would cover just under 2% of land not previously designated. 2.4% of land would be removed from designation entirely.

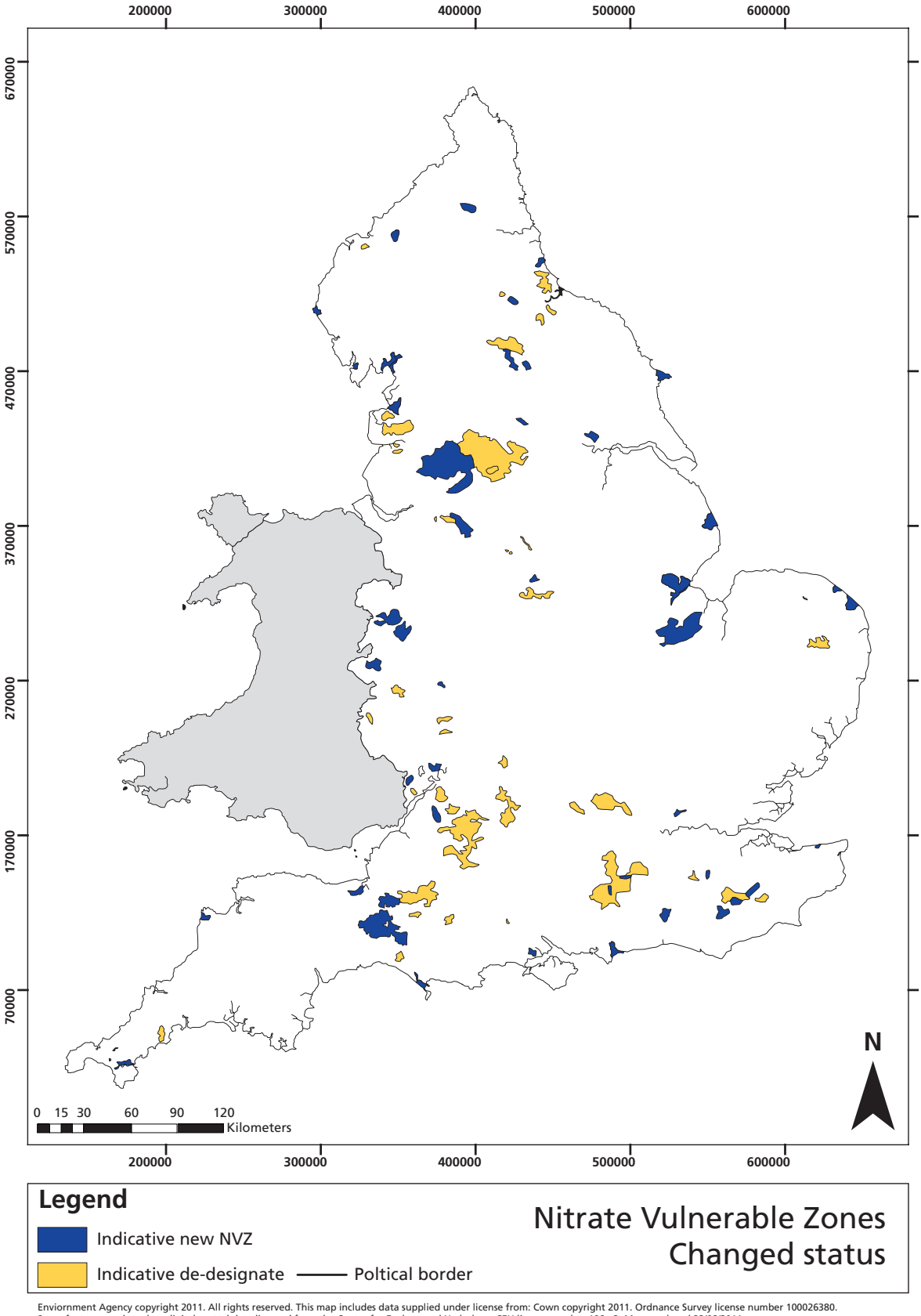


Figure 6: Indicative NVZ changed status map

Annex 3: Glossary and Definition of terms

Abbreviations and Acronyms

AP – Action Programme

CLA – Country Land and Business Association

CoGAP – Codes of Good Agricultural Practice

Defra – Department for Environment, Food and Rural Affairs

EA – Environment Agency

EU – European Union

FYM – Farm Yard Manure

N – Nitrogen

NFU – National Farmers Union

NMP – Nutrient Management Plan

NVZ – Nitrate Vulnerable Zone

NVZ AP – Nitrate Vulnerable Zone Action Programme

RB209 – Fertiliser Recommendations for Agricultural and Horticultural Crops

RPA – Rural Payments Agency

SSAFO – Silage Slurry and Fuel Oil

UK – United Kingdom

WFD – Water Framework Directive

Definitions of terms

Ammonia	A strong colourless gas with a pungent odour. Ammonia nitrate is commonly used in agriculture as a high-nitrogen fertilizer.
Code of Good Agricultural Practice	A single guide consolidating three previous codes, helping farmers to protect and enhance water, soil and air quality.
Common Agricultural Policy	The Common Agricultural Policy is a system of European Union Agricultural subsidies and programmes. It combines a direct subsidy payment for crops and land which may be cultivated with price support mechanisms.
Environment Agency	The Environment Agency is an Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs. Their principal aims are to protect and improve the environment, and to promote sustainable development.
European Commission	The European Commission represents the general interest of the EU and is the driving force in proposing legislation (to Parliament and the Council), administering and implementing EU policies, enforcing EU law (jointly with the Court of Justice) and negotiating in the international arena.
Eutrophic	Having waters rich in mineral and organic nutrients that promote a proliferation of plant life.
Excreta	Any livestock manure that is excreted by livestock that is deposited on the land whilst livestock are grazing in the field
Existing NVZs	NVZs designated in previous reviews (either 1996, 2002 or 2008)
Farm	An area or areas of land and its buildings, which is used for the growing of crops or rearing of livestock, and includes livestock units and any outlying fields all of which form part of an individual farm business
Farmyard manure	Straw-based solid manures

First tier Tribunal	The First-tier Tribunal is part of the administrative justice system of the United Kingdom. It was created in 2008 to rationalise the tribunal system, and has since taken on the functions of twenty previously existing tribunals.
General Regulatory Chamber	The First Tier Tribunal comprises of 6 Chambers The General Regulatory Chamber is the first of these and incorporates tribunals relating to Charities, Claims Management Services, Consumer Credit Act, Environment, Estate Agents Act, Gambling Commission, immigration services, information rights, local government standards in England, and transport.
Greenhouse gases	A greenhouse gas (sometimes abbreviated GHG) is a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.
High available N content	In relation to organic manure, means more than 30% of the total N content of the organic manure is released in the year in which it is applied to land. Examples include cattle and pig slurry, poultry manure, and liquid digested sludge.
HM Government Code of Practice on consultation	The Government Code of Practice on Consultation sets out the approach the Government will take when it has decided to run a formal, written, public consultation exercise. The new Code applies from November 2008 to all central Government departments' formal, written consultation exercises.
Impact Assessment	Impact assessment is a process that prepares evidence for political decision-makers on the advantages and disadvantages of possible policy options by assessing their potential impact, including economic, social and environmental.
Indicative NVZs	The areas that are being used at this consultation stage prior to the areas recommended for designation by the Environment Agency in 2012
Land application	The addition of nitrogen fertilisers to land, whether by spreading on the surface of the land, injection into the land, placing below the surface of the land or mixing with the surface layers of the land; this does not include livestock manure that is deposited directly to land by grazing animals
Leaching	The loss of water-soluble plant nutrients from the soil.
Livestock manure	Manure excreted by livestock, or a mixture of bedding material and manure excreted by livestock, even in processed form
Livestock Manure N farm Limit	A limit to the annual average loading of the total amount of nitrogen (N) in livestock manure across the area of a holding in a Nitrate Vulnerable Zone.
Loading	The addition of nitrogen fertilisers to land by any means other than gaseous or natural atmospheric deposition. It includes land application of nitrogen fertilisers and organic manures and includes deposition of livestock manures and urine directly to land by grazing animals
Low available N content	In relation to organic manure, means less than 30% of the total N content of the organic manure is released in the year in which it is applied to land. Examples include Farm Yard Manure.
Low intensity farming	Undefined at the moment
Manufactured fertiliser	Any nitrogen fertiliser, excluding those derived from organic materials, which is manufactured by an industrial process
Methodology Working Group	A working group established to examine the methodology and development of NVZ designations.
National Ecosystem Assessment	The UK National Ecosystem Assessment (UK NEA) is the first analysis of the UK's natural environment in terms of the benefits it provides to society and our continuing economic prosperity.

Natural Environment White Paper	The Natural Environment White Paper outlines the Government's vision for the natural environment over the next 50 years, backed up with practical action to deliver that ambition. The themes of the white paper include: protecting and improving our natural environment; growing a green economy; reconnecting people with nature; and international and EU leadership.
Nitrate	Nitrates are minerals needed by plants, to produce protein in order for the plant to grow. Nitrates may be obtained by the plant via the root hair cells
Nitrates Directive	The Nitrates Directive, adopted by the European Union in 1991, aims to reduce water pollution caused by nitrogen from agricultural sources and to prevent such pollution in the future.
Nitrate vulnerable zone (NVZs)	An area of land designated in accordance with Article 3 of the Nitrates Directive as a vulnerable zone for the purposes of that Directive
Nitrogen fertiliser	Any substance containing a nitrogen compound or nitrogen compounds utilised on land to enhance growth of vegetation. It includes "manufactured fertiliser" and "organic manure".
Nitrous oxide	Nitrous oxide is a greenhouse gas produced by micro-organisms after the application of fertilisers and organic manures, especially if the soil is poorly aerated.
N Max limits	N Max effectively means the maximum permitted amount of Nitrogen from any source that a crop may receive.
Nutrient Management Planning	A Nutrient Management Plan is a systematic way of considering all nutrient uses on a farm in order to achieve a closer balance between nutrient inputs and outputs.
Organic manure	Includes livestock manure and any nitrogen fertiliser derived from organic matter. It includes sewage sludge and other organic materials.
Organic Manure N field Limit	An upper limit for the addition of nitrogen from all livestock manures and all other organic manures applied to each field in any 12 months in a Nitrate Vulnerable Zone. It does not include excreta and urine deposited directly to land by grazing animals.
Occupier	Includes, • Owner-occupier • Tenant with a full agricultural tenancy –a tenancy agreement normally with lifetime security and subject to the provisions of the Agricultural Holdings Act 1986, including statutory succession tenancies. • Tenant with a Farm Business Tenancy –a tenancy agreement taken up on or after 1 September 1995 under the provisions of the Agricultural Tenancies Act 1995.
Phosphorous	Phosphorus is essential to the growth of biological organisms, and occurs naturally in bodies of water mainly in the form of phosphate.
Poultry litter	A mixture of bedding material and poultry excreta which is sufficiently dry to be stored in a stack without slumping
Poultry manure	All poultry-produced manures and litters
Precision slurry spreaders	Will be defined in regulations but would include band spreading (trailing hoses and shoes) and shallow injection
Readily available N	Nitrogen that is present in livestock and other organic manures either as ammonium or nitrate, or in poultry manure as uric-acid N, is known as the readily available fraction as it will be taken up more quickly by plants than nitrogen that is bound in organic compounds
Shallow injection	A method of injecting slurry into soil by spreading it using a shallow method (as opposed to deep). This technique has been shown to reduce nitrogen loss.
Slurry	Excreta produced by livestock while in a yard or building, including mixtures with bedding, rainwater and washings, that have a consistency that allows them to be pumped or discharged by gravity at any stage of the handling process.
Solid manure	Manure that contains enough bedding material or is dry enough to be stacked

Task Force on Farming Regulation	The Task Force was set up in July 2010 to carry out an independent review of relevant regulations and their implementation, and advise on how best to achieve a risk-based system of regulation in future, whilst maintaining high environmental, welfare and safety standards.
Total N content	Total Nitrogen Content refers only to those amounts of nitrogen that give rise to nitrate/nitrite ions.
Transitional waters	Transitional waters are those waters between the land and the sea and include fjords, estuaries, lagoons, deltas and rias. They often encompass river mouths and so show the transition from freshwater to marine conditions.
Upper tribunal	The Upper Tribunal hears appeals from the First-tier Tribunal on questions of law, exercises powers of judicial review in certain circumstances and enforces decisions made by the First-tier Tribunal.
Water Framework Directive	Water Framework Directive is a piece of European legislation which promotes a new approach to water management through river basin planning.

(ii) Soil

Sandy soil	soil where – (a) in the layer up to 40 cm deep, there are – (i) more than 50 per cent by weight of sand sized particles (particles from 0.06 to 2mm in diameter), (ii) less than 18 per cent by weight of clay sized particles (particles less than 0.02 mm diameter), and (iii) less than 5 per cent by weight of organic carbon, and (b) in the layer from 40 to 80 cm depth, the sum of the percentage, by weight, of silt sized particles (particles between 0.02 and 0.06 mm in diameter) and double the percentage, by weight, of clay sized particles is less than or equal to 30% of the total weight of sand, silt and clay sized particles
Shallow soil	Soil which is less than 40 cm deep
All other soils	All soils which are not sandy or shallow

(iii) Crops

Crop	Any vegetation which is grown for agricultural profit or benefit, including grains, vegetables and fruit, grass and forage, horticulture and bulbs.
Spring sown crop	Any crop which is sown after 1 January and before 31 July in any year
Grassland	Land on which the vegetation consists predominantly of grass species
Crop requirement	The amount of nitrogen fertiliser which it is reasonable to apply to land in any year having regard to the foreseeable nitrogen requirement of the crop growing or to be grown on the land and the nitrogen supply to the crop from the soil and from other sources, including any previous applications of livestock and other organic manures
Soil nitrogen supply	The amount of nitrogen (kgN/ha) in the soil that becomes available for uptake by the crop from establishment to the end of the growing season, taking account of nitrogen losses

Name/ Organisation Name _____ Reference Number (for official use only) _____

Question	Yes agree (✓)	No Disagree (✓)	Supplementary Question	Comment
Question 1 Do you prefer Option 1 (continuing with discrete NVZ designations) or Option 2 (applying the Action Programme to a 'Whole England' NVZ)?			The Department would welcome comments on the advantages and disadvantages of the two options and the reasons why you prefer one over the other.	
Question 2 This section is included mainly to provide information as to our current thinking. Do you consider that the Tribunal Procedure First-tier Tribunal (General Regulatory Chamber) Rules 2009 are currently suitable to cover these appeals against designations of Nitrate Vulnerable Zones?.				
Question 3 Do you agree that crop available nitrogen from all types of organic manures should count towards the Nmax limits?				
Question 4 Do you agree with the proposed changes to the livestock manure N efficiency standard values used in Nmax?			What concerns or benefits do you think this change may raise?	
Question 5 Do you consider the limit of 500 kg/ha of compost total N in any 2 year period is workable?			Are there any working restrictions we should consider to ensure we are not creating any unintended adverse consequences?	
Question 6 Do you agree that a limit of 1000 kg/ha of compost total N in any 4 year period when used as a mulch is workable?			Do you have concerns or benefits that such a change may raise?	
Question 7 Do you consider the Department should seek to renew the Derogation?				

Question	Yes agree (✓)		No Disagree (✓)	Supplementary Question	Comment
Question 8 Which of the 3 closed spreading period options do you prefer?	Option 1 (✓)	Option 2 (✓)	Option 2 (✓)	Do you have any comments or further evidence on any of the options that you think ministers should be aware of?	
Question 9 Do you support the above closed spreading period based on rainfall banding?				What additional advantages or disadvantages do you see with this problem?	
Question 10 Do you think that reducing the quantity of slurry that can be spread immediately after the closed period is a better mechanism for managing nitrate leaching than extending the closed periods? If the application rate during this period were reduced, do you agree with the suggested reductions in the rate of application?				What further points should the Government take into account when considering this issue?	
Question 11 Do you agree with the proposals to reduce the minimum distance for spreading slurry near watercourses if a precision slurry spreader is used? Is the proposed minimum distance from watercourses (6 metres) correct, or does it pose an unacceptable risk of pollution?				Do you have any comments on how this proposal could work or be improved?	
Question 12 Do you agree with this proposed change to the SSAFO calculation?				What other factors should ministers consider?	
Question 13 Do you agree that the Action Programme does not require any amendments with respect to the storage of solid livestock manures?					
Question 14 Do you have ideas that will reduce the burden of record-keeping while maintaining environmental protection?				Are there any situations where we should not reduce record-keeping?	

Name/ Organisation Name _____ Reference Number (for official use only) _____ Page 3 continuation

Question	Yes agree (✓)	No Disagree (✓)	Supplementary Question	Comment
Question 15 What low intensity farming systems do you consider should not have to keep Nitrates Regulations records? We would be interested to discuss suggestions with those responsible for running such schemes.			Should "low intensity" be defined in terms of the Nmax limit, manure nitrogen loadings, or both? Or should other factors be part of the definition (and if so, what are they)? For your preferred way of defining "low intensity", what level(s) of the relevant measures would be appropriate?	
Question 16 Do you think cover crops should be included in the Action Programme? If so, have we identified the correct circumstances (sandy soils over groundwater) for their use?			Are the suggested dates appropriate? If not, what dates would you suggest? What 'actions' do you consider should be defined to show compliance?	
Question 17 Do you agree that the exemption in Regulation 6 should be repealed? Do you think the deadline for doing so (22 December 2015) is the right one?				
Question 18 Do you agree that a person constructing a store should notify the EA of his/her intention to do so before firmly committing to the project?			How might we improve this provision?	
Question 19 Do you consider all the measures should be implemented from 1 January 2013?				

Thank you for your input. The closing date for this consultation is 16 March 2012.
Please send to the following email address:
nitratesdirectiveteam@defra.gsi.gov.uk

Or by post to:
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