EXPLANATORY MEMORANDUM TO

THE NITRATE POLLUTION PREVENTION (AMENDMENT) REGULATIONS

2009 No. 3160

1. This explanatory memorandum has been prepared by the Department for Environment, Food & Rural Affairs and is laid before Parliament by Command of Her Majesty.

2. Purpose of the instrument

2.1 The Nitrate Pollution Prevention (Amendment) Regulations 2009 ("the 2009 Regulations") implement Commission Decision (2009/431/EC) ("the Decision"). The Decision grants a derogation from Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources ("the Nitrates Directive"), in relation to the maximum amount of nitrogen from livestock manure that can be applied on individual farms in Nitrate Vulnerable Zones, providing certain conditions are met. The 2009 Regulations also make minor corrections and clarifications to the Nitrate Pollution Prevention Regulations 2008 (SI 2008/2349) ("the 2008 Regulations"), including deferring by 12 months the date by which farmers in "deferred slurry storage areas" must comply with Regulation 22(1) and Part 7.

3. Matters of special interest to the Joint Committee on Statutory Instruments

3.1 None.

4. Legislative Context

4.1 The 2009 Regulations implement the Decision, through amendments to the 2008 Regulations. A Transposition Note is attached at Annex 1.

4.2 The 2008 Regulations, which came into force on 1st January 2009, implement the Nitrates Directive in England through the designation of Nitrate Vulnerable Zones (NVZs) and through the establishment of rules which farmers with land within the NVZs must follow. One of the requirements is that the amount of livestock manure applied to the land each year (within each farm or livestock unit), including by the animals themselves, shall not exceed 170kg nitrogen per hectare. This is known as the livestock manure N farm limit.

4.3 In January 2009, Great Britain (England, Scotland and Wales) requested a derogation to allow a higher limit to be applied on grassland farms where certain conditions are met. The Decision granting this derogation was published in the Official Journal on 6th June 2009. The 2009 Regulations implement the Decision by:

- amending Regulation 12 of the 2008 Regulations, which limits the amount of livestock manure applied to the land each year to 170 kg N/ha, to allow a higher limit of 250 kg N per hectare per year on grassland farms; and

- establishing the application procedures and additional mandatory controls that must be followed by those wishing to benefit from a derogation.

5. Territorial Extent and Application

5.1 This instrument applies to England.

5.2 The Decision also applies to Scotland and Wales and the Devolved Administrations will make their own Regulations to implement it. Northern Ireland was granted a derogation (with the same conditions) in 2007, and have implemented it through the Nitrates Action Programme (Amendment) Regulations (Northern Ireland) 2008 (SR 2008/196).

6. European Convention on Human Rights

As the instrument is subject to negative resolution procedure and does not amend primary legislation, no statement is required.

7. Policy background

- ***What is being done and why***

7.1 The Nitrates Directive is an environmental measure that aims to reduce water pollution caused or induced by nitrates from agricultural sources and to prevent such pollution in the future. One of the requirements of the Directive is that, for each farm or livestock unit, the amount of livestock manure applied to the land each year, including by the animals themselves, shall not exceed 170 kg N per hectare.

7.2 The Directive also allows Member States to fix a limit that is higher than 170 kg N/ha provided it can be demonstrated that doing so will not undermine the achievement of the environmental objective of the Directive (or negatively affect the environment more generally). Great Britain applied for a derogation in January 2009, as it will:

- significantly reduce the costs to the agricultural industry of implementing the Nitrates Directive, and improve the overall cost-effectiveness of the NVZ Action Programme;
- help to avoid potential unintended environmental consequences of the 170 kg/N/ha limit on grassland farms;
- improve the level of environmental protection achieved through the implementation of additional mandatory controls; and
- be implemented on farms located in areas which meet the criteria set out in the Nitrates Directive that must be met for a derogation to be approved.

7.3 The Decision allows the application of manure nitrogen from grazing livestock (cattle, sheep, goats, deer and horses) up to a higher limit of 250 kg of nitrogen per hectare per year on an individual farm if the farmer meets the following conditions:

- the farmer must submit an application form in each year they wish to have a derogation;
- at least 80% of the agricultural area of the farm must be grassland;
- temporary grassland on sandy soils must only be cultivated in the spring ;

- ploughed grass must be followed with a crop with a high nitrogen requirement;
- livestock manures must not be spread on grassland in the Autumn before it is to be cultivated;
- leguminous or other plants fixing atmospheric nitrogen must not be included in the crop rotation;
- farmers must prepare a fertilisation plan and keep fertiliser accounts.

The Decision also requires the authorities within Great Britain to:

- apply administrative controls to each farm benefiting from a derogation, including to the annual applications and fertiliser accounts;
- establish additional and reinforced environmental monitoring within areas of the country benefiting from a derogation;
- carry out field inspections at a minimum of 3% of farms benefitting from a derogation;
- submit an annual report to the Commission on the implementation of the derogation.

7.4 The derogation expires on 31 December 2012. The Department may seek to extend this agreement for a further four years, but there is no guarantee that future derogations will be granted.

7.5 The 2009 Regulations also defer by 12 months the date by which farmers in 'NVZ Deferred Slurry Storage areas' are required to comply with Regulation 22(1) and Part 7 of the 2008 Regulations (i.e. the prohibition on high trajectory spreading equipment and the manure storage requirements). These areas are identified on the map referred to the in the Regulations (available on the Defra website) and relate to approximately 5.5% of the Nitrate Vulnerable Zone that does not drain to waters identified as polluted. These areas did drain to polluted waters at the time of the 2002 designations and retained their designation status in 2008 because there was insufficient evidence to demonstrate that:

- the observed improvement in water quality would be sustained; and
- removal of the Action Programme measures in the areas would not simply lead to an increase in pollution and their re-designation during the next review.

7.6 Given that these areas may be de-designated at the next NVZ review (to be implemented from January 2013), it is not proportionate to require farmers to undertake the investment required to put in place additional manure storage facilities. The effect of these provisions is that if a holding in this area is de-designated in the next review, the occupier will not need to comply with the requirements. If the holding remains within the next review, the occupier must comply from 1st January 2013.

- ***Consolidation***

7.7 The Regulations amend the 2008 Regulations. The Department has no plans to consolidate the legislation.

8. Consultation outcome

8.1 In 2007 the Department consulted on proposals to implement the Nitrates Directive, and specifically invited views on whether Great Britain should apply for a derogation from the whole farm limit for livestock manure. A total of 83 responses (including many from dairy farmers and their consultants) were received on this question, and 72 (87%) were in favour of a derogation up to 250 kgN/ha. The key points made in support were that higher nitrogen inputs are needed for grassland and that a derogation would benefit dairy farmers currently facing significant economic pressures.

8.2 The Department has not undertaken a 12 week public consultation on the draft 2009 Regulations as we previously consulted on the principle of applying for the derogation. As the Decision was granted, the 2009 Regulations simply implement the Decision, to the benefit of farmers who are now able to take advantage of it. The Department has very little flexibility in implementing the Decision and a 12 week consultation would have significantly delayed implementation and therefore postponed realisation of the benefits.

8.3 A stakeholder group (including representatives of the Environment Agency, Natural England, the National Farmers Union, the Tenant Farmers' Association, the Country Land & Business Association and the Devolved Administrations) has been fully involved in the process of applying for the derogation and planning for its implementation and was invited to comment on the draft 2009 Regulations.

9. Guidance

9.1 A comprehensive package of practical guidance material is available for farmers to enable them to comply with the requirements of the 2008 Regulations. The Department has produced a supplementary guidance leaflet to explain how to apply for, and comply with, the derogation.

10. Impact

10.1 The impact on business, charities or voluntary bodies is outlined in the attached Impact Assessment. There is likely to be no impact on charities or voluntary bodies. The Department estimates that the costs to the livestock sector of complying with the Nitrates Directive will be significantly reduced (by approximately £16.2m – £21.0m per annum).

10.2 The impact on the public sector is neglible.

10.3 An Impact Assessment is attached to this memorandum.

11. Regulating small business

11.1 The legislation applies to small business, in so far as those farms meeting the requirements will be able to apply for a derogation. The derogation is intended to benefit all grassland farmers of livestock and the Department does not consider that anything in the decision will place a disproportionate burden on small farms.

12. Monitoring & review

12.1 The Commission Decision requires the Department to monitor the impact of the Derogation and to report annually to the Commission. The first report is due in June 2010.

13. Contact

Amy Ferguson at the Department for Environment, Food & Rural Affairs Tel: [020 7238 4577] or email: [amy.ferguson@defra.gsi.gov.uk] can answer any queries regarding this instrument.

Annex 1

Transposition Note for Commission Decision (2009/431/EC) granting a derogation from the Nitrates Directive (91/676/EEC) in England

1. This Transposition Note explains how the Nitrate Pollution Prevention (Amendment) Regulations 2009 ("the 2009 Regulations") transpose the main elements of Commission Decision (2009/431/EC) ("the Decision") in England. This Decision grants Great Britain a derogation from one of the more stringent requirements of the Nitrates Directive (the requirement that, for each farm or livestock unit, the amount of livestock manure applied to the land each year, including by the animals themselves, shall not exceed 170kg of nitrogen per hectare).

2. The 2009 Regulations amend the Nitrate Pollution Prevention Regulations 2008 (SI 2008/2349) ("the 2008 Regulations") and are made under section 2(2) of the European Communities Act 1972 (the Secretary of State is designated by SI 2008/301 in relation to the environment). The 2009 Regulations apply only in relation to England. Wales and Scotland are in the process of making their own Regulations to implement the Decision. Northern Ireland was granted a derogation in 2007, implemented through the Nitrates Action Programme (Amendment) Regulations (Northern Ireland) 2008.

3. The Regulations do not go beyond what is necessary to implement the Decision, although they do make minor clarifications to the Nitrates Pollution Prevention Regulations 2008 (including deferring by 12 months the date by which famers in areas identified as potential as NVZ Deferred Slurry Storage Areas must comply with Regulation 22(1) and Part 7).

4. The main effect of the 2009 Regulations is to allow a higher application of manure nitrogen from grazing livestock (cattle, sheep, goats, deer and horses) up to a limit of 250kg nitrogen per hectare per year on an individual farm if the farmer meets certain conditions.

Commission Decision (2009/431/EC)

Article*	Objective	Implementation	Responsibility
2	***Definitions*** Defines "grassland farms", "grazing livestock" and "grass".	Regulation 3 contains definitions of "grassland holding", "grazing livestock" and "grass."	n/a
3	***Scope*** Confirms that the Decision is to be applied to grassland farms on an individual basis, subject to the conditions set out in Articles 4, 5 and 6.	Regulation 5 amends Part 3 of the Nitrate Pollution Prevention Regulations 2008, to introduce a new regulation 13A which specifies that only an occupier of a holding may apply for a derogation where more than 80% of the agricultural area is sown with grass (or any person on the occupier's behalf). New regulation 13C provides that where 70% or more of a holding's area is sown with grass during 2009 the holding is deemed to be a derogated holding for that calendar year.	n/a
4 4.1 & 4.2 4.3	***Annual authorisation and commitment*** Requires farmers who wish to benefit from the derogation to submit an annual application to the competent authority and to undertake to fulfil the conditions provided for in Articles 5 & 6. Competent authority to ensure that applications for a derogation are submitted to administrative control and where the conditions set out in Articles 5 and 6 are not fulfilled the applicant shall be informed and the application shall be refused.	New regulation 13A sets out the procedure for farmers to apply for the derogation. New regulation 13C sets out the appeals process for an applicant to appeal where a derogation is refused. New regulation 13A sets out the application procedure and the requirement to notify the applicant of the decision. Where a derogation application is refused, reasons must be given.	Occupier Environment Agency
5	***Application of manure and other fertilisers*** Establishes the maximum amount of nitrogen from manure to be applied on land per year as 250kg/ha, subject to certain	Schedule 4 sets out the requirements that apply to derogated holdings.	Occupier

	conditions including the requirement for the farmer to keep a fertilisation plan, to analyse soil for nitrogen and phosphorus content every four years and not to spread livestock manure in the autumn before grass cultivation. Requires each derogated farm to keep fertilisation accounts which must be submitted to the Environment Agency each year.	Paragraph 2 establishes that the occupier of a holding for which a derogation has been granted may apply no more than 250kg/N/ha per year. Paragraphs 3 and 4 makes provision for how an occupier must plan in advance the amount of nitrogen and phosphate fertiliser that may be spread, the information to be included in such plans. Paragraph 5 sets out soil sampling and analysis requirements. Paragraphs 9 and 10 establish closed periods for ploughing grass on a derogated holding and requires ploughed grass to be sown with a particular crop or grass within certain periods. Paragraph 19 requires an occupier to submit fertilisation accounts for the calendar year to the Environment Agency by 30th April of the following year.	
6	***Land Management*** Establishes that 80% of the area available for manure application on farms shall be cultivated with grass and sets out measures with which farmers benefitting from a derogation must comply.	Paragraph 8 requires that the occupier of a holding which has been granted a derogation must maintain 80% grassland during the year for which the derogation has been granted. Taken as a whole, Schedule 4 sets out the measures which farmers benefitting from a derogation must comply.	Occupier
8	***Monitoring***		

	Establishes the monitoring requirements on the competent authority, including the requirement to undertake a study on intensive grassland systems in order to improve nutrient management.	No provision required in the Regulations as this has been implemented through administrative means. Defra intends to undertake the study required as part of the review of the Nitrates Action Programme in 2011/12.	Environment Agency
9	***Controls*** Requires the competent national authority carry out administrative controls in respect of all farms benefitting from a derogation and field inspections for at least 3% of these farms.	No provision required in the Regulations as this has been implemented through administrative means.	Environment Agency
10	***Reporting*** Requires the competent authorities to submit an annual report to the Commission on the results of the monitoring, including information on non-compliant farms.	No provision required in the Regulations as this has been implemented through administrative means.	Environment Agency

***** Articles 1, 7, 11 and 12 are standard and do not require transposition.

Summary: Intervention & Options

Department /Agency:	Title:	
DEFRA	Impact Assessment of the Nitrate Pollution Prevention (Amendment) Regulations 2009	
Stage: Final	**Version:** 2	**Date:** 30 November 2009
Related Publications:		

Available to view or download at:

http://www.

Contact for enquiries: Amy Ferguson **Telephone:** 020 7238 4577

What is the problem under consideration? Why is government intervention necessary?

The Nitrates Directive is an environmental measure that aims to reduce water pollution caused by nitrates from agricultural sources. One of the measures listed in the Directive requires that, for each farm or livestock unit, the amount of livestock manure applied to the land each year, including by the animals themselves, shall not exceed 170 kg N per hectare. There are concerns, explained below, that this limit may have unintended consquences which could impact negatively on the environment as well as threatening the viability of some dairy farms.

What are the policy objectives and the intended effects?

In January 2009, Britain (England, Scotland and Wales) submitted a request to the European Commission to fix a limit that is higher than 170 kg N/ha. A Commission Decision granting this derogation in Britain was published within the Official Journal on 29 May 2009. The derogation will reduce the costs to the agricultural industry of implementing the Nitrates Directive and improve cost-effectiveness of the NVZ Action Programme as well as help to avoid potential environmental consequences of the 170 limit. The purpose of these Regulations is to implement the Commission's decision.

What policy options have been considered? Please justify any preferred option.

Two options were considered: Option 1 – do nothing and implement the 170 limit. Option 2 – apply to the European Commission for a derogation from the 170 limit. A consultation process was initiated and a Regulatory Impact Assessment (RIA) accompanying the consultation provided an assessment of the economic and environmental impacts of both the 170 limit and the derogation. In light of the consultation and RIA, a commitment was made to apply for a derogation (Option 2). The derogation is expected to reduce the costs of complying with the Directive by £58.4m - £76.9m.

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?

Policy to be reviewed by the next Nitrates Review in 2012 (occurs every 4 years), the derogation will expire on 31 December 2012.

Ministerial Sign-off For SELECT STAGE Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:

Huw Irranca-Davies

.....Date: 02nd December 2009

Summary: Analysis & Evidence

Policy Option:	Description:

COSTS

ANNUAL COSTS

One-off (Transition)	Yrs
£ 0.57m	4

Average Annual Cost (excluding one-off)

£ -12.6m to -15.8m

Description and scale of **key monetised costs** by 'main affected groups' Cost to government of £1.0m.

Overall cost saving, hence negative values shown. Admin costs to farmers of £540k pa, with an additional £870k in 1st year for consultancy fees. Cost to farmers of land management measures: £120k pa. Cost saving to farmers from having the derogation and reduced P fertiliser: £17m, £22m pa.

Total Cost (PV) £ -44.3m to -57.7m

Other **key non-monetised costs** by 'main affected groups' There is a very small increased risk of environmental damage (0.5% increase). It is not possible to value this. However the cost required, as explained in the box above, would be wholly disproportionate.

BENEFITS

ANNUAL BENEFITS

One-off	Yrs
£ n/a	

Average Annual Benefit (excluding one-off)

£ 12.6m to 15.8m

Description and scale of **key monetised benefits** by 'main affected groups' For these calculations reductions in costs (i.e. negative costs in box above) to farmers are the corollary of benefits to farmers. Cost savings to farmers arise from a derogation to previous regulations. These cost savings will be felt by a group of farmers estimated at 1,500 dairy farmers applying for the derogation.

Total Benefit (PV) £ 44.3m to 57.7m

Other **key non-monetised benefits** by 'main affected groups' The environmental benefits of avoiding the potential unintended adverse side-effects of the previous limit, although not quantifiable are likely to be a tangible benefit.

Key Assumptions/Sensitivities/Risks The number of farmers applying for the derrogation is 1,500. The net benefits will be more or less depending on whether the actual uptake will be more or less than this figure.

Price Base Year 2009	Time Period Years 4	**Net Benefit Range** (NPV) £ 44m to 58m	**NET BENEFIT** (NPV Best estimate) £ 51m

What is the geographic coverage of the policy/option?			England	
On what date will the policy be implemented?			1 January 2009	
Which organisation(s) will enforce the policy?			Environment Agency	
What is the total annual cost of enforcement for these organisations?			£ 157k	
Does enforcement comply with Hampton principles?			Yes	
Will implementation go beyond minimum EU requirements?			No	
What is the value of the proposed offsetting measure per year?			£ n/a	
What is the value of changes in greenhouse gas emissions?			£	
Will the proposal have a significant impact on competition?			No	
Annual cost (£-£) per organisation (excluding one-off)	Micro **-11to-14k**	Small	Medium	Large
Are any of these organisations exempt?	No	No	N/A	N/A

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £ 1.8m Decrease of £ **Net Impact** £ 1.8m

Key: **Annual costs and benefits: Constant Prices** **(Net) Present Value**

[Use this space (with a recommended maximum of 30 pages) to set out the evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Ensure that the information is organised in such a way as to explain clearly the summary information on the preceding pages of this form.]

Impact Assessment of proposals to implement a derogation from the EC Nitrates Directive

1. Purpose and intended effect of proposal

1.1 Objective

To implement the Commission Decision (2009/431/EC) which grants a derogation from the Nitrates Directive (91/676/EEC) in England through the introduction of Regulations which:

- Amend Regulation 12 of the Nitrate Pollution Prevention Regulations 2008, which limits the amount of livestock manure applied to the land each year to 170 kg N/ha, to allow a higher limit of 250 kg N per hectare per year on grassland farms; and
- Establish the application procedures and additional mandatory controls that must be followed by individual farms wishing to benefit from a derogation.

1.2 Background

1.2.1 The Nitrates Directive

The Nitrates Directive is an environmental measure that aims to reduce water pollution caused or induced by nitrates from agricultural sources and to prevent such pollution in the future.

The Directive requires member states to establish an Action Programme (Article 5), within designated vulnerable zones (Article 3), for the purposes of achieving the environmental objectives of the Directive (Article 1). The Action Programme is to contain those measures listed in Annex III of the Directive and those included in the code of good agricultural practice (Article 4 & Annex II).

One of the measures listed in Annex III requires that, for each farm or livestock unit, the amount of livestock manure applied to the land each year, including by the animals themselves, shall not exceed 170 kg N per hectare. This is often referred to as the 'Livestock manure N farm limit' or the '170 limit'.

Annex III of the Directive also allows Member States to fix a limit that is higher than 170 kg N/ha provided it can be demonstrated that doing so will not undermine the achievement of the environmental objective of the Directive (or negatively affect the environment more generally). This derogation must be approved by the European Commission and be justified on the basis of objective criteria, for example:

- Long growing seasons
- Crops with high nitrogen requirement
- High net precipitation
- Soils with exceptionally high de-nitrification capacity

1.2.2 Implementation of the Nitrates Directive in England[1]

The Nitrate Pollution Prevention Regulation 2008 (SI 2349) came into force on 1 January 2009 and implements the Nitrates Directive in England. In particular they:

- Designate areas (approx. 70%) of England, which drain to waters identified as nitrate-polluted, as Nitrate Vulnerable Zones (NVZs)

[1] implementation of the Nitrates Directive in the UK is a devolved matter. Northern Ireland, Scotland and Wales have each established their own legislation to implement the Directive and derogation within their countries.

- Establish rules which farmers with land within the NVZs must follow (the 'Action Programme'). One of the rules (Regulation 12) establishes a Livestock manure N farm limit of 170 kg N/ha/yr in line with the requirements of Annex III of the Directive.

An impact assessment[2], describing the environmental and economic impacts of the NVZs and Action Programme measures, highlights that the 170 limit is expected to reduce agricultural nitrate losses in England by 0 – 0.5% at a cost of £26.5million - £33 million per year.

In January 2009, Britain (England, Scotland and Wales) submitted a request to the European Commission to fix a limit that is higher than 170 kg N/ha. The EC Nitrates Committee voted in favour of the request on 10 March 2009. A Commission Decision granting this derogation in Britain was published within the Official Journal on 29 May 2009. The proposed Regulations give effect to this EC Decision in England.

1.2.3 The Commission Decision granting a derogation

The main elements of the EC Decision[3] are summarised below:

- It allows the application of manure N from grazing livestock (cattle, sheep, goats, deer and horses) up to a higher limit of 250 kg N per hectare per year on an individual farm if the farmer meets the conditions summarised below:
    - the farmer must submit an application form in each year they wish to have a derogation
    - at least 80% of the agricultural area of the farm must be grassland
    - temporary grassland on sandy soils must only be cultivated in the spring
    - ploughed grass must be followed with a crop with a high nitrogen requirement
    - livestock manures must not be spread on grassland in the autumn before it is to be cultivated
    - leguminous or other plants fixing atmospheric nitrogen must not be included in the crop rotation
    - farmers must prepare a fertilisation plan and keep fertiliser accounts

- It requires the authorities within Britain to:
    - apply administrative controls to each farm benefitting from a derogation, including to the annual applications and fertiliser accounts
    - establish additional and reinforced environmental monitoring within areas of the country benefiting from a derogation
    - carry out field inspections at a minimum of 3% of farms benefitting from a derogation
    - submit an annual report to the Commission on implementation of the derogation

- The derogation expires on 31 December 2012. The Department may seek to extend this agreement for a further four years, but there is no guarantee that future derogations will be possible.

1.3 Rationale for Government intervention

A sustainable agricultural industry, protecting natural resources (including improving the quality of water), and improving the condition of protected sites and enhancing biodiversity, are important objectives for the Department.

The derogation is key to ensuring our implementation of the Nitrates Directive effectively balances these often competing objectives. It will:

- significantly reduce the costs to the agricultural industry of implementing the Nitrates Directive, and improve the overall cost-effectiveness of the NVZ Action Programme;
- help to avoid potential, unintended and negative, environmental consequences of the 170 limit;
- improve the level of environmental protection achieved through the implementation of additional mandatory controls; and
- be implemented on farms located in areas which meet the criteria set out in the Nitrates Directive that must be met for a derogation to be approved.

Note – The full case supporting a derogation in Britain, as submitted to the European Commission, is available via the Defra website[4].

[2] The impact assessment is available via http://www.opsi.gov.uk/si/si2008/em/uksiem_20082349_en.pdf
[3] The full text of the EC Decision is available via http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:141:0048:0051:EN:PDF

[4] The technical case is available via http://www.defra.gov.uk/environment/quality/water/pdf/uk-britain-derogation-request.pdf

1.3.1 Improving cost-effectiveness

The impact assessment for the Nitrate Pollution Prevention Regulations highlights that the 170 limit is one of the most costly measures contained within the new Action Programme (£26.5million - £33 million per year) but is only expected to have a minimal impact on losses of nitrate from agriculture (0 – 0.5% reduction).

Therefore, implementing the derogation will significantly improve the cost-effectiveness of the Nitrates Regulations. It has not been possible to estimate the environmental benefits of the derogation, although one of the reasons for its implementation is to avoid possible unintended consequences arising from the Livestock Manure N Farm Limit on grassland farms

1.3.2 Avoiding unintended consequences

There are concerns that implementing the 170 limit could actually increase pollution. Whilst, the intention of the 170 limit is to compel livestock farms to reduce stocking density and adopt less intensive production methods (thereby reducing nitrate losses from the farm), the reality is that they may change their livestock management or farming system in other ways, because operating at a lower stocking density is likely to undermine their economic viability.

For example, the farms may respond to the 170 limit by:

- Stopping dairy farming and ploughing out grassland for the production of arable crops. This could have potentially serious negative impacts on losses of nitrate, phosphorus, sediment and carbon dioxide to the environment.
- Maintaining overall milk production levels on the farm by increasing the feeding of concentrates to increase milk production per cow. It is estimated that this change would increase phosphorus (P) surplus by between 6 and 8 kg P/1000 litres of milk which is more than double the average surplus of 2 kg P/1000 litres estimated in 2005.

These unintended consequences are discussed in more detail in Section 3.

1.3.3 Increasing environmental protection

In addition to avoiding unintended environmental consequences, the derogation may actually improve the level of environmental protection achieved because farms benefitting from a derogation must implement a number of additional mandatory controls. For example:

- A fertilisation plan for each field must be prepared for all applications of nitrogen and phosphate fertiliser.
- Ploughed grass must be followed immediately by a crop with a high nitrogen requirement.
- Grassland on sandy soils must only be cultivated in the spring.
- Livestock manures must not be spread to grassland six months before grass cultivation.
- The crop rotation must not include leguminous crops.

The environmental impact of these additional controls is discussed in more detail in Section 3.

1.3.4 Meeting the criteria set out in the Directive

As stated previously, Annex III of the Directive only allows a derogation from the 170 limit if it can be demonstrated that it will not undermine the achievement of the environmental objective of the Directive, and also that it can be justified on the basis of objective criteria, such as:

- High net precipitation
- Long growing seasons
- Crops with high nitrogen requirement
- Soils with exceptionally high denitrification capacity

The grassland areas of England, where derogated farms are likely to be located, meet the above criteria:

- Net precipitation is high, commonly between 800 to 1200 mm per year.
- Rainfall typically exceeds potential evapo-transpiration for at least nine months of the year.
- Growing season of between 225 to 275 days a year.
- High output grassland is on soils with a good capacity for retaining moisture.

These favourable conditions mean that grass has a potential high nitrogen uptake of between 300 to 375 kg N/ha per year. Therefore, grassland farms stocked at a higher rate of 250 kg N/ha per year will be able to make effective use of the higher nitrogen inputs to the production system and are unlikely to experience higher losses of nitrate.

A full description of how the grassland areas of England meet the criteria established by the Directive is set out in the technical case supporting a derogation in Britain (Defra, 2008).

2. Proposals

2.1 Options for consultation

In August 2007, a consultation was launched on implementation of the EC Nitrates Directive in England[5]. It sought views on proposals to revise the areas designated as NVZs and revise the Action Programme, including the introduction of the 170 limit. It also highlighted that the Department was considering whether to approach the European Commission to apply for a derogation, and sought views on whether consultees considered there was a convincing justification for such a derogation.

Two options were considered:

Option 1 – do nothing and implement the 170 limit.
Option 2 – apply to the European Commission for a derogation from the 170 limit.

The partial Regulatory Impact Assessment (RIA) accompanying the consultation provided an assessment of the economic and environmental impacts of both the 170 limit and the derogation (Defra, 2007a).

2.2 Outcomes of the consultation

83 of the responses to the consultation were received on the issue of a derogation, with the vast majority (87%) in favour of establishing a higher limit of 250 kg N/ha/yr on grassland farms. A summary of the responses is available on the Defra website (Defra, 2008).

In light of the assessment contained in the partial RIA, and the response to the consultation, a firm commitment was made to apply for a derogation (Option 2).

2.3 Sectors and groups affected

2.3.1 Agricultural industry

The previous Action Programme (established in 1998) set the following livestock manure N farm limits:

- 170 kg N/ha for arable land
- 250 kg N/ha for grassland

The change introduced by the new Action Programme, relative to the previous Action Programme, is a reduction from 250 to 170 kg/ha N on the grassland area of the farm.

Pig and poultry farms are intensively stocked, but the manure is largely applied to arable land, which is already subject to the limit of 170 kg N/ha. The 170 limit under the new Action Programme is therefore assumed to have little or no additional impact on pig and poultry farming.

The 170 limit impacts mainly on intensive dairy farms, because the change relates to grassland only; and because beef and sheep farms are generally stocked well below the 170 limit. Therefore, the derogation from the 170 limit, which is for grassland farms and manure from grazing livestock only, will mainly affect the dairy industry.

2.3.2 Milk processing industry

The impact assessment for the Nitrate Pollution Prevention Regulations suggests that the new Action Programme, without a derogation, may lead to a reduction in dairy cow numbers. This fall in cow numbers is estimated to lead to a reduction in milk deliveries to dairies of around 0.175 million tonnes per year[6]. In order to assess the significance of this change in terms of milk processing industry's competitiveness, it is useful to consider the projected diminution in supply against the overall market for milk.

The predicted reduction in milk production represents a small proportion of overall UK supply of just over 1% (between 1989 and 2005, deliveries of milk to UK dairies have been consistently between 14.0 and 14.5 million tonnes). However, in regions where reductions are expected to

[5] Consultation is available via http://www.defra.gov.uk/environment/quality/water/waterquality/diffuse/nitrate/library-archive.htm#consult

[6] This is based on the Economic Model's prediction of reductions in cow numbers multiplied by the average annual yield per cow for 2005/06 of 6,800 litres (taken from MDC Datum).

be greatest (i.e. the North West and the West Midlands), the effects could be exacerbated and could lead to short-term difficulties in meeting supply requirements.

The derogation will reduce pressure on the dairy industry to de-stock, and therefore mitigate against the risk of milk supply failing to meet demand in specific regions.

2.4 Unintended consequences

As highlighted in Section 1.3.2, one of the main purposes of implementing the derogation in England is to avoid the possible unintended consequences arising from implementation of the 170 limit. These are described in detail in Section 3.2.1.

Furthermore, there is little reason to believe that the derogation will give rise to any unintended consequences as it will allow the continuation of the status quo (i.e. before the new Nitrates Regulations were introduced, grassland farms were allowed to operate up to a limit of 250 kg N/ha/yr – the derogation will allow them to continue to operate up to this limit).

The derogation was granted to Britain on the basis that it would not undermine the achievement of the environmental objectives of the Nitrates Directive (or adversely impact the environment more generally). Whilst there is strong evidence to suggest this view, we are putting in place a number of arrangements to check that the derogation does not in fact lead to an increase in pollution:

- We will undertake enhanced monitoring of water quality in catchments within which farms benefitting from a derogation are located;
- We will establish a study to collect, by the end of the derogation period, detailed scientific information on intensive grassland systems in order to improve our understanding of nutrient losses.
- In catchments of protected sites under the Habitats Directive, we will undertake an appropriate assessment to determine the impact of granting a derogation on the site – a derogation will only be approved if it can be demonstrated that it will not adversely affect the integrity of the site.
- The lifespan of the derogation is limited to four years and therefore any impacts will be time limited. Furthermore, we will review evidence of the actual impacts of the derogation before approaching the European Commission for an extension for a further four years. This implies that the time frame over which the present values are calculated is four years and not the usual 10 years since there is a possibility that the derogation will be altered after four years.

3. Environmental impacts

3.1 Principal environmental benefits

The principal intended benefits of the Nitrate Pollution Prevention Regulations are associated with a reduction in losses of nitrate (and indirectly other pollutants), achieved by:

- controlling the amount of nitrogen applied to land in fertilisers and organic manures;
- controlling timing of fertiliser and organic manure application;
- controlling methods of fertiliser and organic manure application; and
- taking steps to manage other risks of pollutant loss.

The main benefits from a reduction in the amount of nitrate (and other pollutants) entering waters are likely to be:

- *improved natural habitats resulting from a reduction in nutrient enrichment of waters and associated eutrophication* – the Environment Agency (2007) estimates that the damage cost of water pollution from agriculture in England and Wales is in the region of £445m – 872m per year, of which around £196m - 497m accounts for the impact of agriculture on river and wetland ecosystems and natural habitats.
- *a potential reduction in drinking water treatment costs where abstractions occur from surface or ground water* - Ofwat (2004) estimated that the cost to the water industry to reduce high nitrate levels caused by diffuse pollution in drinking water supplies would be £288 million (capital expenditure) and £6 million per annum (operating expenditure) for the 2005-2010 period.

These principal benefits are fully described in the impact assessment (Defra, 2008) accompanying the 2008 Regulations.

The Action Programme will also have indirect impacts on losses of phosphorus to water, and emissions of ammonia and greenhouses gases to air.

3.2 Specific environmental impacts of the derogation

As described in Section 1.3, the main environmental impacts of the derogation are:

- avoiding the unintended and negative environmental consequences of the 170 limit; and
- improving the level of environmental protection achieved through the introduction of additional mandatory controls on land use and management.

These environmental impacts are discussed in more detail in sections 3.2.1 and 3.2.2 respectively.

3.2.1 Avoiding the unintended consequences of the 170 limit

About 40% of dairy farms in Britain have a current livestock manure N loading of over 170 kg N/ha. These dairy farmers will need to change their farming system and/or management practices in order to comply with the 170 limit – the responses available to them are described below. Some of these responses are expected to have adverse implications on water quality which the derogation will help to avoid.

Response 1 – Move livestock manure off the farm

Moving livestock manure to another farm will be an option for some dairy farms where there is enough suitable and available land nearby for spreading. However, in some dairy farming areas, there is very limited available land that could be used as an outlet for these manures. This is mainly because any application of manure to land must comply with all of the measures contained within the new Action Programme. The land must also be accessible and within a reasonable travelling distance.

The main measures which restrict the availability of land for export are:

- *The 170 limit* – The land must have spare capacity for additional applications of livestock manure N without breaching the limit of 170 kg N/ha. Land with a loading of 130 kg N/ha or above (i.e. within 40 kg N/ha of the 170 limit) is not likely to be available as a destination for manure as the spare loading capacity is small. There are areas within NVZs (for instance the North West, West Midland and South West regions) where the current loading means that there is a scarcity of land available for additional applications of manure.

- *The closed periods* – Livestock manure with a high readily available N content must not be applied to land during the grassland closed spreading period (1st September - 31st December on sandy or shallow soils; 15th October – 15th January on all other soil types).

The impact of moving manure on nitrate loss (and losses of other pollutants) is negligible because manures are simply being moved from one location to another. Both locations are likely to be within the NVZ boundary, with similar climate; and would be subject to the same Action Programme measures. Furthermore, the farms exporting the manure are likely to use more manufactured N fertiliser to compensate for the reduced amount of N applied to land from manure.

Transport of manure between farms would also increase carbon emissions and could introduce bio-security issues.

Response 2 – Buy or rent more land

Buying or renting additional land is an option for some farms to increase the area of farmed land under their control, thereby reducing the N loading across the whole farmed area. However, the availability of suitable new land is very limited in some areas for the same reasons as explained above. Also, land prices have recently increased significantly, and the purchase or renting of additional land is very expensive.

Again, the impact of this response on nitrate loss (and losses of other pollutants) is negligible because manures are simply being moved from one location to another.

Response 3 – Reduce the livestock stocking rate

This option would have severe financial implications, and would be chosen only in areas where the first two responses were not feasible due to a high concentration of dairying in the locality (e.g. North West, West Midland and South West regions).

A reduction in the stocking rate on a farm is expected to lead to a significant reduction in nitrate losses from the farm. However, it is considered that in most cases the surplus stock and associated milk quota would be taken up elsewhere and therefore overall reductions in nitrate loss would be limited.

Furthermore, for many farms, a significant reduction in the stocking rate is not an economically sustainable option for complying with the 170 limit. Therefore, rather than operating with less dairy livestock, they may decide to:

- buy in or contract rear young stock replacements instead of rearing their own young stock (Response 3a),
- increase milk production per cow by increasing the feeding of concentrates (Response 3b), or
- leave dairying (Response 3c).

Response 3a – Buying / contract rearing young stock replacements

Approximately 50% of dairy farms currently rear their own young stock (Defra 2008). Some farms may modify their system to buy in or contract rear young stock replacements instead of rearing their own young stock, as this would minimise impacts on the milk output of their business.

However, this will usually only have a small effect on the N loading of the farm, and increasing livestock movements between farms would increase bio-security risks and may jeopardise the potential long-term performance of herds and their progeny.

Response 3b – Increasing the feeding of concentrates

Dairy farms that need to reduce their stocking rate to comply with the 170 limit may increase the use of concentrate feeds to increase the milk yield per cow and thus maximise milk output from the reduced number of cows on the farm. However, an increase in the use of concentrates will increase the phosphorus (P) surplus observed on dairy farms.

Many dairy farms currently have a phosphorus surplus due to the P in materials brought onto the farm (mainly livestock feeds and fertilisers) exceeding the P in produce taken off the farm (mainly livestock products and livestock manures). A review of farm nutrient balances (Chambers, 2005) based on actual data from 88 dairy farms showed an average surplus of 20 kg P/ha. This was equivalent to about 2.0 kg P/1000 litres of milk.

This is reflected by data from the Representative Soil Sampling Scheme in England and Wales. These data show that 35% of all grassland soils are above the recommended soil P analysis maintenance target of Index 2 and have unnecessarily high soil phosphorus concentrations (Figure 1). This indicates that there is considerable scope to improve the efficiency of use of P fertilisers to grassland.

The amount of P lost by erosion or leaching depends on the soil P content. Losses in solution increase rapidly once soil P reserves reach elevated levels (e.g. Soil P index 4 or above). Losses can be minimised by maintaining soil P levels at Index 2 or by allowing the P content of high P index soils to run down.

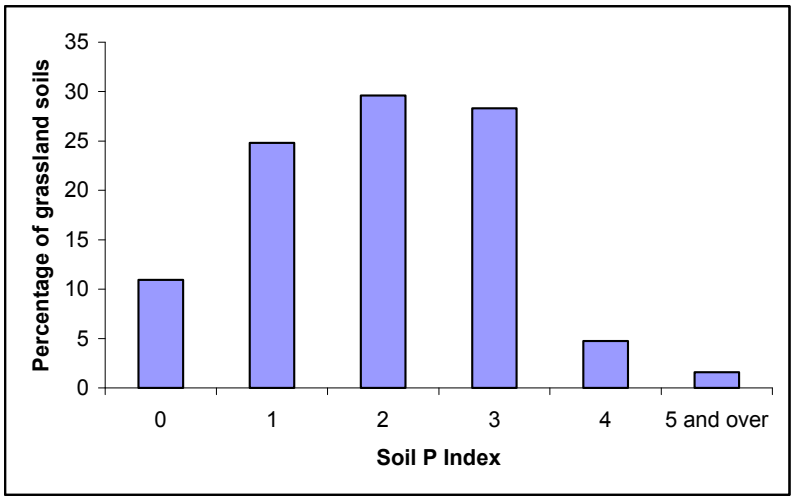


Figure 1. Distribution of soil P Indices in grassland soils

It is estimated that an increase in the use of concentrates would further increase the P surplus on dairy farms by between 6 and 8 kg P/1000 litres of milk. This is more than double the current surplus of 2.0 kg P/1000 litres of milk reported by Chambers (2005) for dairy farms. This will lead to even higher soil P concentrations, and increased losses of P to the water environment.

The derogation will enable dairy farmers to operate at the current stocking rate and therefore they will not have to change their livestock dietary management in the manner described above. Therefore, the derogation help to reduce the risk that greater quantities of phosphorus will be lost from land.

Response 3c – Leave dairying

If there are no acceptable options for reducing the manure N loading in order to meet the 170 limit that are consistent with continuing a sustainable dairy farming business, then farmers will leave dairying. There has been a long term decline in dairy farm numbers and the 170 limit will further increase pressure on dairy farmers. A national industry survey of 'Dairy Intentions' (DairyCo, 2008) has shown that 7% of dairy farmers are currently planning to stop dairy farming, but that this would rise to 30% if economic conditions worsen.

Agricultural statistics show that 18% of the land on farms that currently have a livestock manure N loading of over 170 kg N/ha is cropped with arable crops, including cereals and forage crops. Many of these farms have suitable land and the necessary expertise to switch part or all of their farming system from high output dairy grassland farming into the production of arable crops. This could significantly increase the losses of nitrogen, phosphorus, sediment and reduce the storage of soil carbon.

There is strong scientific evidence that conversion of long-term grassland to arable cropping will release large quantities of nitrate and carbon dioxide resulting from the mineralisation of soil organic matter. The quantity of nitrate released will be greatest for long-term grass where soil organic matter has accumulated over a period of many years of grassland management.

For example, Whitmore *et al.* (1992) monitored losses of soil nitrogen over a period of 25 years following the ploughing out of long-term grassland and subsequent cropping with arable crops on deep loam soils (Figure 2). During this period, nearly 4,000 kg/ha of nitrogen was lost from the topsoil layer (0–25 cm) due to the decomposition and mineralisation of the soil organic matter. Around half of this loss occurred in the first 5 years following ploughing out. Measurements of nitrate concentrations in drainage water showed that they reached a peak of nearly 2,000 mg/l nitrate in the first year after the grassland was ploughed out (to put this in context, the Nitrates Directive defines waters as polluted if they have a nitrate concentration greater than 50 mg/l). This release of nitrate occurred mainly in the autumn and winter period when the potential uptake of available nitrogen by growing crops is at a low level.

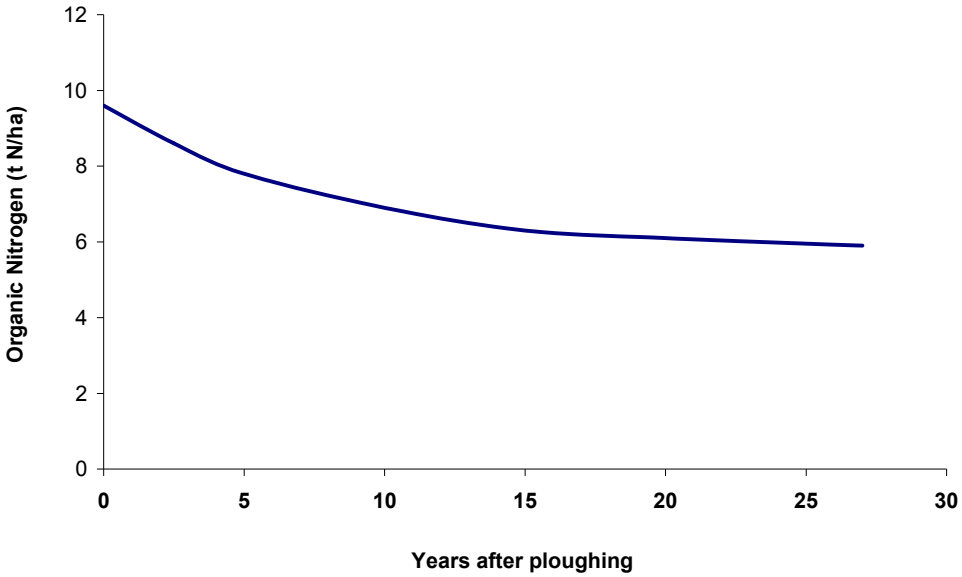


Figure 2. Loss of organic nitrogen from soil following ploughing out of grass (Whitmore *et al.,* 1992)

These data are supported by information from the national soil inventory which shows that the organic carbon content of soils used for grassland production is typically 1.8% higher than that in soils used for arable production. This is equivalent to about 5,000 kg/ha of nitrogen (Soil Survey of England and Wales, 1984). The decomposition of soil organic matter will also result in losses of carbon to the atmosphere. Based on a typical C:N ratio of 10-12 for soil organic matter (Brady and Weil, 1996), the release of 5,000 kg/ha of nitrogen would be accompanied by the release of about 50,000 kg/ha of carbon.

The derogation will encourage farms to continue in dairy farming and thus reduce the risk of grassland being ploughed out for arable cropping which will have potentially serious negative impacts on losses of nitrate, phosphorus, sediment and carbon dioxide to the environment.

Summary

As highlighted in Section 1.3.1, modelling of the impact of the 170 limit has shown that there would be a reduction of less than 0.5% in the current total loading of nitrate to water from agricultural sources at the national scale (Defra, 2007). Reductions in agricultural losses of phosphorus, and emissions of ammonia and greenhouse gases (CO_2 e) due to the 170 limit were also estimated at less than 0.5%, 0.3% and 0.2% respectively.

However, these estimates were based upon an assumption that dairy farms will reduce stocking density to comply with the 170 limit (i.e. implement Response 3). As discussed above, the adoption of Responses 3b & 3c would be more likely than a reduction in stocking density, and therefore the 170 limit could actually lead to an increase in pollution.

Not only is the adoption of Responses 3b & 3c more likely, but the magnitude of the environmental impact of these Responses is also greater. For example, the potential increase in nitrate, phosphorus and greenhouse gas losses due to the ploughing out of grassland (Response 3c), would far outweigh the small decrease in losses described above. Therefore, implementation of the derogation is preferable to implementation of the 170 limit.

It has not been possible to quantify the adverse impacts that the derogation will help avoid because:

- it is not possible to predict which of the six Responses will be adopted by individual farmers, as this will be determined by factors unique to each farm, and
- a farmer may still choose, for example, to leave dairying and convert to arable, even though a derogation is offered.

3.2.2 Implementation of additional mandatory controls

Farms benefitting from a derogation will have to comply with the below mandatory controls:

- at least 80% of the agricultural area of the farm must be grassland
- temporary grassland on sandy soils must only be cultivated in the spring
- ploughed grass must be followed with a crop with a high nitrogen requirement
- livestock manures must not be spread on grassland six months before it is to be cultivated
- leguminous or other plants fixing atmospheric nitrogen must not be included in the crop rotation
- farmers must prepare a fertilisation plan and keep fertiliser accounts

These will have additional environmental benefits as described below.

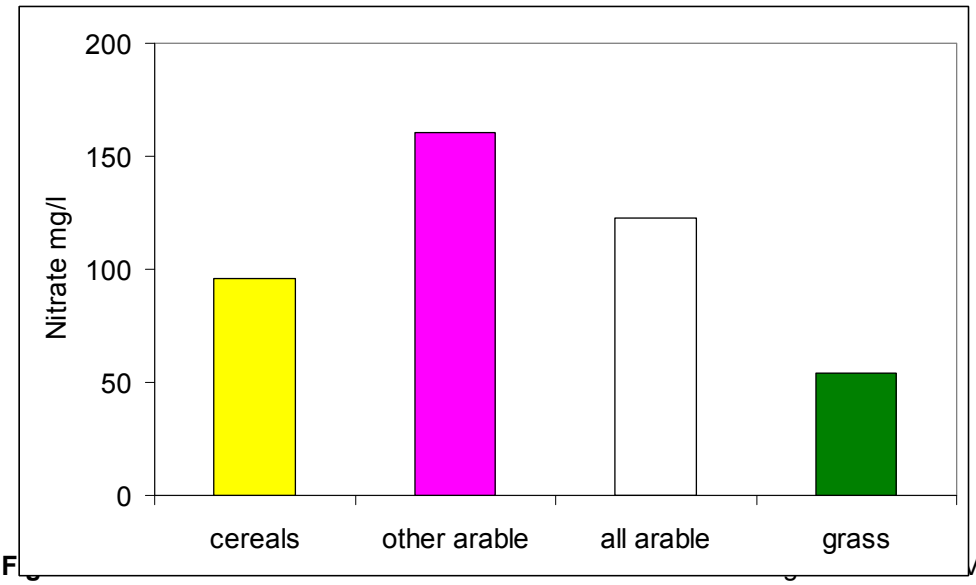
Maintain at least 80% of the agricultural area of the farm as grassland

Our request for a derogation was approved on the basis that the favourable conditions (e.g. high precipitation, long growing season) in grassland areas of England mean that grass has a potential high nitrogen uptake of between 300 to 375 kg N/ha per year. Grassland farms are permitted a derogation, allowing applications of manure up to a higher rate of 250 kg N/ha per year, as they are able to make effective use of the higher nitrogen inputs to the production system and are unlikely to experience higher losses of nitrate.

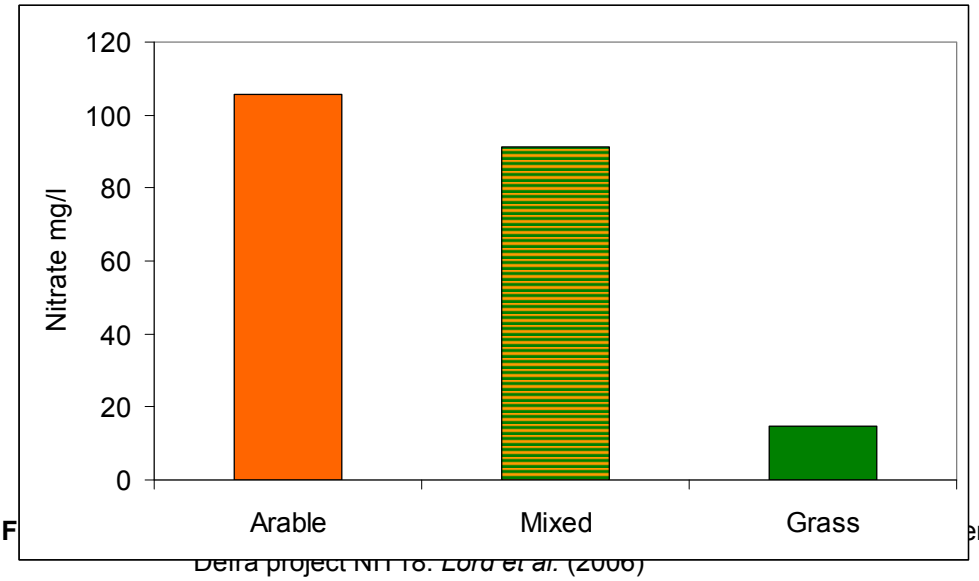
Given the importance of grass to the derogation, farms benefitting from a derogation must maintain a minimum area of grassland. This has been set at 80% of the total farm area.

This requirement may also act to reduce nitrate losses from agriculture as it may encourage farms that need a derogation to convert arable areas of their farm to grassland. At similar nitrogen inputs, arable cropping usually results in greater nitrate loss than grassland, because of the periods when the arable land is uncropped in autumn and winter.

Direct field measurements confirm that nitrate concentrations in water draining from arable land are higher than from grassland (see Figures 3 and 4).



F …VZs, winters 2004/5 and 2005/6. Source: Defra project NIT18: *Lord et al.* (2006)



F …er NVZs, winter 2005/6. Source: Defra project NIT18: *Lord et al.* (2006)

Cultivation of grass – manure applications

Section 3.2.1 highlighted that, as the cultivation of soils results in mineralisation of organic N and increases the risk of nitrate leaching, ploughing up grass can release large amounts of nitrogen. The amount of mineralisation is strongly affected by soil temperature, moisture and the amount of N left in the soil following the harvest of the previous crop.

In the case of grassland, mineralisation will be greater following applications of N fertiliser or manure. Therefore, to minimise the amount of nitrogen released following cultivation, farms benefitting from a derogation must not apply livestock manure to grassland six months before ploughing. This practice has been encouraged by the Code of Good Agricultural Practice (CoGAP) for many years.

Cultivation of grass – timing

Autumn cultivation of grass increases the risk of nitrate loss because the warm and moist soil conditions at this time of year encourage high rates of mineralisation when, in the absence of an actively growing crop, there is little N uptake. Drainage during the winter period will then transport the accumulated nitrate out of the soil profile.

Farms benefitting from a derogation must only cultivate temporary grass on sandy soils in the spring. Cultivation in spring is better, because bare soil is not exposed over the winter period and an actively growing crop is established soon after cultivation to take up N and provide surface cover.

This measure will be limited to sandy soils because of practical difficulties that would be experienced on medium to heavy soils. On heavier soil types, if ploughing is not carried out in late autumn, the delayed cultivations may result in the spring crop being drilled into a drying seedbed. This may impact on establishment and yield. For grassland, reseeding in spring is less reliable than in autumn. Delaying cultivation until the spring may also have implications for the control of some weeds. There are also soil structural implications associated with cultivating during a wet spring.

Cultivation of grass – establishment of following crops

Farms benefitting from a derogation will also have to establish a crop with a high nitrogen requirement within four weeks of ploughing up grassland. This will help ensure that as much nitrogen as possible is taken up by the following crop, rather than leached from the soil.

Leguminous plants must not be included in the crop rotation

Leguminous plants fix atmospheric nitrogen and therefore do not require any applications of nitrogen fertiliser. Any nitrogen that is applied is likely to be lost to the environment as it will not be taken up by the crop. If farms benefitting from a derogation grew large areas of leguminous crops, there may be insufficient land to which to spread the manure produced by the livestock kept on the farm. Therefore, farms benefitting from a derogation will not be allowed to include leguminous or other plants fixing atmospheric nitrogen in the crop rotation.

This prohibition may also act to reduce nitrate losses from agriculture. Monitoring of fields with leguminous crops shows very high autumn soil mineral nitrogen (SMN) and nitrate concentrations. An example of this field-scale monitoring is shown in Figure 5. The SMN in the field was low (40 kg/ha N) following carrots in 2004, and the mean nitrate concentration in leachate that winter was 83 mg/l. The following year, after a pea crop, autumn SMN was 86 kg/ha and the mean nitrate concentration in leachate was 265 mg/l.

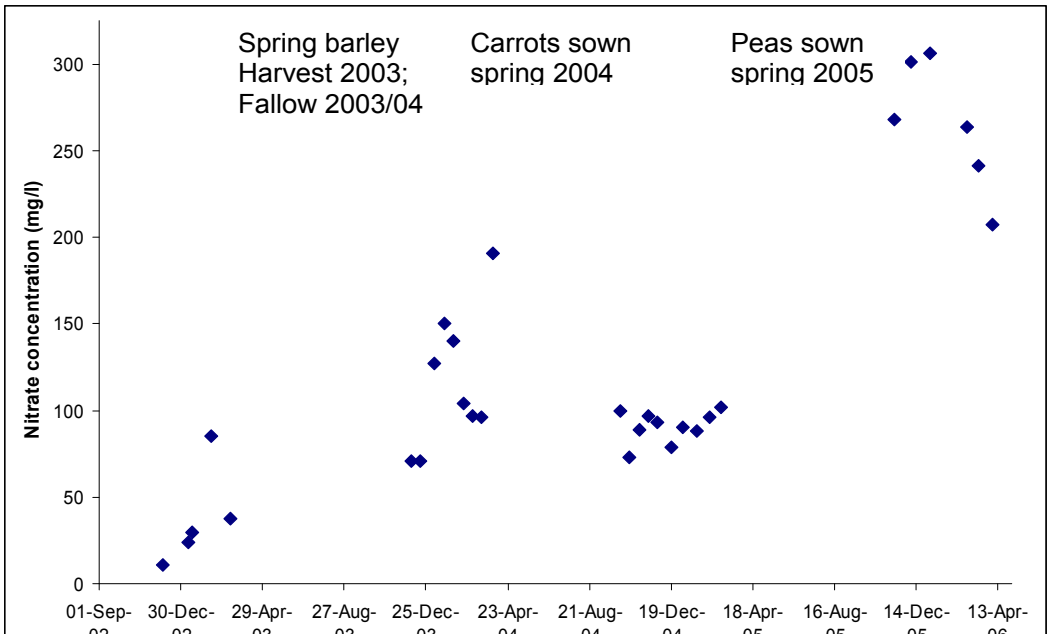


Figure 5. Leachate nitrate concentrations over a crop rotation including peas in 2005.

Preparation of a fertilisation plan
As identified in Section 3.2.1, there is considerable scope to improve the efficiency of use of P fertilisers to grassland. 35% of all grassland soils are above the recommended soil P analysis maintenance target of Index 2 and have unnecessarily high soil phosphorus concentrations.

Farms benefitting from a derogation will have to plan all applications of P fertiliser and organic manure with the aim of improving the efficiency of use of P fertilisers. Producing a plan will help them ensure P inputs are balanced with crop offtakes and avoid applications of P to soils with a high P index. They will also be required to take soil samples and analyse for P content at least every four years. This will help them plan their applications and correctly identify areas of their farm with a high P index.

Note – farmers are already required to prepare a plan for their use of nitrogen fertiliser and therefore there are no additional benefits in relation to nitrate losses.

3.3 Summary of environmental impacts

The impacts of the derogation were not quantified. However, any impacts are unlikely to be significant for the following reasons:

- The number of farms that are expected to apply for a derogation in England is small (see below), and therefore the spatial extent of any effects will be limited:
    - 1,500 farms. This figure was estimated by ADAS and is based on Defra's Farm Census data. Although, it has not been possible to verify the precise nature of this figure, it is the most current estimate we have of the number of farmers applying for the derogation.
    - covering 94,093 ha

- Implementing the derogation will allow the continuation of the status quo (i.e. before the new Nitrates Regulations were introduced, grassland farms were allowed to operate up to a limit of 250 kg N/ha/yr – the derogation will allow them to continue to operate up to this limit) and therefore there is no reason to anticipate a significant change in the level of pollution currently observed.

- The EC Decision granting a derogation in the UK is time limited to four years and therefore the duration of any effects would be short-lived.

4. Agricultural costs and benefits

4.1 Principal costs

The impact assessment, published alongside the Nitrate Pollution Prevention Regulations, identified the costs to Government and the agricultural industry associated with implementing the new Action Programme.

It estimated the net annual costs to the agricultural industry as £44.3 - £65.2 million (see Table 1 below).

Table 1. Net annual costs to the agricultural industry of implementing the new Action Programme (£m)

Cost type	Low	High
Additional storage costs	12.8	16.5
Reduction in stocking rate	17.9	21.8
Additional spreading costs	8.5	11.3
Spreading techniques	3.7	8.4
N max (from 2012)	0.3	3.4
Admin burdens	0.4	2.7
Total	**44.3**	**65.2**

The costs associated with implementation of the livestock manure N farm limit of 170 kg N / ha / yr (i.e. 'reduction in stocking rate' and 'additional spreading costs') made up a significant proportion of these overall costs (i.e. £26.4m - £33.1m).

The IA went on to highlight that the derogation from the 170 limit would be expected to reduce the total annual costs by £16.9 – 21.7m and reduce costs to the dairy sector by approximately 60%.

However, the impact assessment did not take account of new costs to the agricultural industry arising from additional record-keeping requirements and land management controls which must be implemented on farms with a derogation. Therefore the cost-savings are not expected to be as great as anticipated by the original IA. Revised estimates of the cost-savings achieved by the derogation are discussed in Section 4.2 below.

Additional costs to Government and the Environment Agency will also be incurred as a result of implementing the derogation. These cost estimates, discussed in more detail in Section 6, include the costs of increased enforcement, enhanced water quality monitoring and analysis, and the provision of additional advice to farmers.

4.2 Specific costs

4.2.1 Admin costs

The derogation establishes a number of new record-keeping requirements which represent a new administrative burden to farmers, the costs of which have been calculated using the Cabinet Office Standard Cost Model (SCM).

Description of new admin burdens

Farmers wishing to benefit from a derogation will have to undertake the following administrative tasks:

- *Familiarisation with the conditions of the derogation*. Farmers will need to read available guidance literature to make sure they are aware of and understand the conditions attached to the derogation (e.g. how to apply for a derogation). Also, some attendance at advice workshops may be required. This will largely be an upfront cost, although some time will need to be spent refreshing memories in later years.

- *Submit an application for a derogation.* This is a completely new requirement, unique to the derogation. There will be three routes available for submitting an application – by post, by phone or via the Whole Farm Approach (online). A template form will be provided for applications by post. This is an annual requirement, although the application process may be significantly quicker after the first year (e.g. the WFA will store the previous years' application data, which can be re-submitted by the simple click of the button if circumstances on farm have not changed between years). All the information to be submitted in the application will be readily available from the fertilisation plan (see below).

- *Prepare a fertilisation plan.* The plan will need to be completed at the start of the calendar year and will need to include:

    a) Agricultural area of the farm, and the area of grassland as on 1 January;

    b) A map of the farm indicating the location of individual fields;

    c) A description of the housing and storage systems in place on the farm, including the volume of the manure storage available;

    d) Expected numbers and type of livestock to be kept on the farm during the calendar year and an estimate of the manure nitrogen and phosphorus that these animals will produce;

    e) Amount and type of livestock manure intended to be imported or exported during the year; and

    f) The foreseeable nitrogen and phosphorus requirement of each crop grown in each field on the farm, together with a plan on how applications of organic manure and manufactured fertiliser will be used to meet these requirements.

  Almost all these records are based on existing requirements under the main Nitrates Regulations, and therefore do not represent additional administrative burdens. However, under the main Nitrates Regulations, points (d) and (e) only need to be undertaken at the end of the calendar year (not the start) and an estimate of manure phosphorus production is not necessary – these are additional requirements under the derogation. Furthermore, farmers are not currently required to plan their use of phosphate fertiliser to meet crop requirements. However, many are likely to already do this under other schemes (e.g. Environmental Stewardship) and there are many templates and computer software to help.

- *Record numbers of livestock kept on the farm and any imports / exports of manure*. Not a new admin requirement as farmers are already required to keep these records under the main Nitrates Regulations.

- *Keep field records of applications of manufactured fertiliser and organic manure*. Farmers are already required to keep field records of applications of organic manure and manufactured nitrogen fertiliser under the main Nitrates Regulations. The only additional requirement under the derogation is to keep records relating to phosphorus applications. Farmers may already do this under other schemes (e.g. Environmental Stewardship) and there are many templates and computer software to help.

- *Submit annual fertilisation accounts to the EA*. This is a completely new requirement, unique to the derogation. The accounts will need to be completed and submitted to the EA at the end of the calendar year and will need to include:

    a) Actual numbers and type of livestock kept on the farm during the calendar year and an estimate of the manure nitrogen that these animals produced;

b) Amount and type of livestock manure imported or exported during the year;

c) The agricultural area of the farm and the areas covered by specified crops; and

d) A summary of inputs of manufactured nitrogen fertiliser.

There will be two routes available for submitting the accounts – by post or via the Whole Farm Approach (online). A template form will be provided for accounts submitted by post. This is an annual requirement, although the process may be significantly quicker after the first year (e.g. the WFA will store the previous years' data, which can be re-submitted by the simple click of the button if circumstances have not changed between years). All the information needed to complete the accounts will be readily available to the farmer from either their existing field records, fertilisation plan or records of livestock numbers (see above).

Population

In order to estimate administrative burden using the SCM, it is necessary to assess the number of farmers that could be affected by the above.

It has been estimated that approximately 1,500 farms in England will request a derogation. It has been the experience of other member states that the initial number of farms requesting a derogation drops off following the first year.

Price

Notes accompanying the Standard Cost Method provide indicative hourly wage rate that could be used in the calculation. These rates are given in Table 2 below.

Table 2. Indicative Hourly Wage Rates

Category of Person	**Typical Rate (£/hr)**
Owner/family member	16.23
Directors	46.04
Senior managers	16.23
Other managers	16.23
Internal professionals (e.g. lawyers, accountants, teachers)	18.00
Technicians/officers (e.g. nurses, building inspectors, estate agents)	12.70
Administrative and clerical staff	8.28
Skilled/unskilled trades	7.27
Other (as specified)	9.48

The most relevant categories for farmers would be either "Owner/family member" or "Other manager" – a rate of £16.23/hr.

Experience has shown that many farmers employ consultants to complete templates and plans associated with similar administrative tasks on their behalf. Consultancy rates are of about £450 per day.

Time

Experience shows that there is an initial 'set-up' cost followed by a much lower annual cost (because many of the key factors in planning and record-keeping remain fixed from year to year, for example soil type and slopes). It is in this set-up phase that assistance from an advisor is most commonly sought. In subsequent years, the time input is much lower and the farmer is more likely to feel able to maintain the plans and records without the need for support from an adviser.

When considering the time required to complete the administrative tasks it is necessary to take into account:

- Defra's intention to provide standard templates (e.g. application form, fertilisation accounts, calculation template for the Livestock manure N farm limit), which farm consultants agree are very helpful in reducing the administrative burden, and

- Defra's intention to use the Whole Farm Approach as a route for submitting the annual applications and fertilisation accounts, as this can significantly reduce the amount of time input required to complete these tasks (e.g. through pre-fill of the data fields, through tailoring of the application form to individual farm circumstances etc.)
- The business as usual element e.g.:
    - the fact that many farmers already maintain their own livestock records and plans for manure and nutrient applications, and
    - related policies with similar administrative requirements, notably the array of soil, crop, manure and nutrient management plans.

The time required to complete each administrative task is estimated below:

- *Familiarisation with the conditions of the derogation*. Approximately, 1½ days required at outset, including attendance at a training course, plus ½ day each year totals 3 days per farm over the whole four year derogation period or 0.75 days per year. Consultancy input will also be required in 2010 of 1 day at £450 in order to assist the farmer to understand the implications of the changes. An initial cost of £450 equates to an annual cost of £125 per farm per year when amortised at 5%.

- *Submit an application for a derogation.* Approximately ½ day per year per farm at the farmer cost (Standard Cost Method figure) of £16.23 per hour.

- *Prepare a fertilisation plan.* The time taken to complete points (d) and (e) at the start of the year is estimated to take 2 hours per farm per year.

- *Keep field records of applications of manufactured fertiliser and organic manure*. The additional costs relate to the keeping of records for applied P from organic and non-organic sources. Estimated additional farmer time 8 hours per farm per year.

- *Submit annual fertilisation accounts to the EA*. Estimated time to submit data 4 hours per farm per year of farmer time at £16.23 per hour (Standard Cost Method figure)

Overall admin costs

The SCM outputs are presented as the overall cost estimates in Table 3 below.

Table 3. Calculation of Administrative Costs

Cost type	Unit cost			Population	Total annual cost (£)
	Time (hr)	Wage (£/hr)	Unit cost (£/farm)		
Familiarisation with the conditions of the derogation – farmer input	6	16.23	97.38	1500	146,070
Familiarisation with the conditions of the derogation – consultancy input	*2*	*62.5*	125	1500	187,500
Submit an application for a derogation	4	16.23	64.92	1500	97,380
Prepare a fertilisation plan	2	16.23	32.46	1500	48,690
Keep field records of fertiliser applications	8	16.23	129.84	1500	194,760
Submit annual fertilisation accounts	4	16.23	64.92	1500	97,380
TOTAL					**771,780**

4.2.2 Land management measures

Soil P sampling

68% of farms undertake regular testing (at least every 5 years) of the nutrient content (indices) of the soil (source Farm Practices Survey 2009, Defra). Thus, it is reasonable to assume there will be an additional cost for approximately a third of farms applying for a derogation. The total area estimated to be covered by derogated farms is 94,093 ha, a third of which will require sampling. Assuming an average field size of 5 hectares (this is based on derogation requirement to sample at least every 5 hectares), thus soil sampling and analysis will need to be undertaken on an additional c. 5,000 fields annually between 2010-2012 (1,500 fields per year) at a cost estimated at £45 per field (this cost is based on prices from a number of providers). Table 4 estimates the total cost of this measure.

Table 4. Estimated Costs Associated with Soil P Sampling

Description	Units	Number	Cost £/unit	Total Annual Cost £
Soil sampling and analysis	fields	1,500	45	67,500

Ploughed grass must be followed immediately by a crop with a high N demand

Spring barley occupies c. 1% of land on dairy farms (Source: Farm Accounts in England 2007/08, Defra). Farmers cannot leave heavy soils to break down over winter as part of seed bed preparation and therefore an extra cultivation may be needed preceding the establishment of spring barley. Thus 941 ha may need an additional cultivation with a power harrow at £37 per hectare (Farm Management Pocketbook, John Nix, 2009). See Table 5 for a calculation of the likely costs.

Table 5. Estimated Costs of Additional Cultivation Before Spring Barley

Description	Units	Number	Cost £/unit	Total Annual Cost £

Extra cultivations	ha	941	37	34,814

Prohibition of legumes within crop rotation
It is estimated that each farm grows 0.4 ha of peas and beans (Source: Farm Accounts in England 2007/08, Defra). The measure which prohibits growing legumes within the crop rotation on a derogated farm may have an economic impact as other crops. However, it is likely that the alternative crops grown will be equally profitable, so a cost estimate is not necessary.

Cost-savings
As highlighted earlier, it has been estimated that the derogation from the 170 limit would be expected to reduce the total annual costs by £16.9 – 21.7m and reduce costs to the dairy sector by approximately 60%.

There may also be some cost-savings to the farmer resulting from the proper planning of phosphate fertiliser use. The fact that 35% of all grassland soils are above the recommended soil P analysis maintenance target of Index 2 (see Section 3.2.1) means that the value of the nutrients applied to the land is not being used to full efficiency. It is anticipated the proper sampling and analysis of the soil, informing the production of the fertilisation plan, will reduce the amount of P applied to land and the amount lost to the environment. This improved efficiency should be manifest in reductions in the purchases of manufactured fertiliser.

The average phosphate application rate to grass is 8 kg/ha (BSFP, 2008), and 80% of the derogated area is grass, i.e. 84,800ha. This gives a total phosphate application in the derogated area of 678,400 kg. If 35% of this phosphate is found to be unnecessary, this leads to a reduction of 237,440 kg of phosphate. At an average cost of £0.54 per kg of phosphate fertiliser,[7] this means a saving to farmers of approximately £130,000 per year from reducing phosphate applications.

The total annual cost savings from the derogation and reduced fertiliser use amount to between £17.03m and £21.83m.

4.3 Summary of costs

Revised estimates of the cost-savings achieved by the derogation are presented in Table 6 below – these now take account of the likely annual costs to farmers of the additional record-keeping requirements and land management controls which must be implemented on farms with a derogation. The costs are expressed as both low and high cost estimates.

Table 6. Summary of annual costs and cost-savings to agriculture arising from implementation of the derogation (£m)

Cost type	Low	High
Costs –		
Admin burdens	0.77	0.77
Soil sampling and analysis	0.07	0.07
Additional cultivations	0.03	0.03
Sub-total	***0.87***	***0.87***
Cost savings –		
Higher limit of 250 compared		

[7] P2O5 fertiliser prices have varied widely over recent months so pricing is not an exact science. However if we take Triple superphosphate (46% P2O5) at say £250 per tonne (it is currently less that this but has been very much higher in recent months) that puts 1 kg P2O5 at 54 pence. See:
https://statistics.defra.gov.uk/esg/index/list.asp?i_id=052 and
http://www.fwi.co.uk/Articles/2009/08/05/117021/fertiliser-market-report-nitrogen-steady-while-potash-eases.html

to limit of 170 Improved nutrient efficiency ***Sub-total***	16.9 0.13 ***17.03***	21.7 0.13 ***21.83***
Total (savings)	**16.16**	**20.96**

5. Enforcement, sanctions and monitoring

The Commission Decision granting a derogation in Britain requires the authorities to:

- apply administrative controls to each farm benefitting from a derogation, including to the annual applications and fertiliser accounts,
- establish reinforced environmental monitoring within areas of the country benefiting from a derogation,
- carry out field inspections at a minimum of 3% of farms benefitting from a derogation, and
- submit an annual report to the Commission on implementation of the derogation.

The Nitrate Pollution Prevention Regulations establish the Environment Agency as the enforcement body. We propose that they also be responsible for checking farmer compliance with the conditions of the derogation – both the administrative controls and the field inspections.

The estimated costs to the Environment Agency of implementing and regulating the derogation over its lifespan are £602,000. Coupled with other estimated costs to Defra of £50,000 in 2009 for R&D, £10,000 in 2010 for the provision of guidance to farmers, £43,000 in 2009 for consultancy input to develop a technical case for the application to Cion, 30% of the total costs of WFA costs of £800,000 (i.e. £240,000) for the development of the WFA application tool) and Defra staff costs of one FTE of £65,255 in 2009. Therefore total costs to the Government of implementing the derogation in England is £1.0m

If the Environment Agency identifies that an occupier has breached any of the conditions of the derogation, then they should be able to take one of the following courses of action:

- For minor breaches – issue a warning letter to the occupier requiring them to take corrective action. Failure to comply with this warning letter may lead the Agency to treat the ongoing breach as major.
- For major breaches – the Agency may rescind the approved derogation for the holding. Consequently, the 170 limit and associated record keeping requirements would apply to the holding and any exceedance of this limit, or failure to keep the records, would be considered to be an offence under the Nitrate Pollution Prevention Regulations.

To note, the new Regulations will not establish any new offences.

6. Total costs a and benefits to all parties

The table below shows the total costs to farmers and government over the four years. Note that the majority of the figures are negative. This represents a cost saving from the baseline of implementing the nitrates directive. The NPV of the total cost savings are between £44.3m and £57.7m. That is, by implementing the derogation farmers save costs.

Table 7: Total costs to all parties, in £millions

	2009	2010	2011	2012
Worst case				
Total (savings) for farmers - worst case	£0.0	-£15.7	-£16.4	-£16.4
Total costs to government	£0.5	£0.2	£0.2	£0.2
Total costs	£0.5	-£15.5	-£16.2	-£16.2
Discounted at 3.5%	£0.5	-£15.0	-£15.1	-£14.6
Net present value (2009/10)	-£44.3			
Best case				
Total (savings) for farmers - best case (£m)	£0.0	-£20.5	-£21.2	-£21.2
Total costs to government	£0.5	£0.2	£0.2	£0.2
Total costs	£0.5	-£20.3	-£21.0	-£21.0
Discounted at 3.5%	£0.5	-£19.6	-£19.6	-£19.0
Net present value (2009/10)	-£57.7			

For the purpose of the net benefit NPV calculation, cost savings have been treated as a benefit. This gives a net benefit range of between £44.3m and £57.7m.

7. References

- Partial Regulatory Impact Assessment on Proposals to revise NVZ Action Programme and extended NVZ coverage in England (August 2007)
- The Protection of Waters Against Pollution from Agriculture: Consultation on the Implementation of the Nitrates Direction in England (August 2007)
- (With supporting papers: D3, D4, D5, G3, G4)
- Summary of Responses to the Consultation (March 2008)
- Government Response to the Consultation (July 2008)
- Final Impact Assessment on the Nitrate Pollution Prevention Regulations 2008

The documents listed above are available at:
http://defraweb/environment/quality/water/waterquality/diffuse/nitrate/library.htm

- Britain's case to the EU for a derogation from the Livestock Manure N Farm Limit (October 2008) http://www.defra.gov.uk/environment/quality/water/pdf/uk-britain-derogation-request.pdf

All references can be found in the above publications

Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	*Results in Evidence Base?*	*Results annexed?*
Competition Assessment	No	Yes
Small Firms Impact Test	No	Yes
Legal Aid	No	Yes
Sustainable Development	No	No
Carbon Assessment	No	No
Other Environment	Yes	No
Health Impact Assessment	No	No
Race Equality	No	Yes
Disability Equality	No	Yes
Gender Equality	No	Yes
Human Rights	No	Yes
Rural Proofing	No	Yes

Annexes

Specific impact tests:

Competition Assessment

Farmers with a derogation will have a cost advantage over farmers without the derogation since they will not face the additional costs. This cost advantage will be most acute in the dairy sector. The impact assessment for the Nitrates Directive identified the dairy sector as carrying the highest share of the additional costs imposed by the 170kg limit. The cost advantage will affect competition between dairy farmers in a two ways.

First, the derogation may lead to the exit of farmers without the derogation in NVZs. This may happen because the Nitrates Pollution Prevention Directive limits the ability of dairy farmers to compete by imposing additional costs. This may lead to increased concentrations of farmers within NVZs. However, given that the number of farmers expected to apply for the derogation is small 1,500, these effects are unlikely to occur; whilst Austria, and the Wallonia region of Belgium, Denmark and Germany have derogations to 230 kg/ha.

Second, the derogation will provide a competitive advantage to English farmers over other member states without the derogation. However, this competitive advantage is unlikely to lead to the farmers in other member states from leaving farming. Table 8 shows that, to the best of our knowledge[8] seven European countries have derogations. A number of European countries have derogations to 250 kg/ha e.g. the Flanders region of Belgium, Eire, the Netherlands, Northern Ireland, Scotland, and Wales.

The dairy sector can be considered at two levels – 10 processed dairy products and liquid milk. Within the processed dairy products sector England's main competitors are France, Belgium, Germany, Eire and the Netherlands.[9] As far as we are aware, all of these countries have a derogation applying to the country or to certain regions in the case of Belgium (See Table 8). The only country without the derogation is France. In the liquid milk sector the low value of milk and the high transport costs result in England's main competitors being Wales and Scotland[10] - both of which have the derogation.

Table 8. European Countries with Derogations

Country	Derogation (kg/ha)	Derogation from
Austria	230	Livestock manure on grassland, grass catch crops or beet or other crops undersown with grass on specific cattle holding. Applies where more than three LUs, more than 2/3 livestock are cattle and >70% area available for manure application is permanent and temporary grass, grass catch crops, forage

[8] Based on internet searches.

[9] The competitors were identified in the impact assessment for the Nitrates Pollution Prevention Regulations.

[10] The competitors were identified in the impact assessment for the Nitrates Pollution Prevention Regulations.

		beets or crops undersown by grass.
Belgium: Flanders Wallonia	250 200 230 115	Livestock manure on grassland and maize undersown with grassland. Winter wheat followed by a catch crop with beet. Grassland from livestock manure on cattle farms, including by the animals themselves. On other land. Applicable where more than three LUs, more than two thirds of livestock are cattle and more than 48 per cent of area available for manure application is permanent and temporary grass.
Cyprus	Unknown	
Czech Republic	Unknown	
Denmark	230	Livestock manure on cattle farms, including by the animals themselves.
Eire	250	Livestock manure. Applicable to farms with at least 80 per cent grassland
Estonia	Unknown	
Finland	Unknown	
France	None	None
Hungary	Unknown	
Germany	230	Livestock manure on fields under intensive grassland, including by the animals themselves in cattle farms.
Greece	Unknown	
Italy	Currently applying	Unknown
Lithuania	Unknown	
Luxembourg	Unknown	
Malta	Unknown	
Netherlands	250	Livestock manure from grazing livestock on grassland farms, including by the animals themselves. Applicable where more than 70 per cent area available for

		manure application is permanent and temporary grass.
Poland	Unknown	
Portugal	Unknown	
Slovak Republic	Unknown	
Slovenia	Unknown	
Spain	Unknown	
Sweden	None	
UK	250	Livestock manure from grazing livestock on grassland farms, including by the animals themselves. Applicable where more than 80 per cent of area available for manure application is permanent and temporary grass.

Source: European Commission, Department for Agriculture and Rural Development.

Over time the competitive advantage that farmers with the derogation have over farmers without the derogation may close and the effects may even out. This may occur if farmers without the derogation innovate to reduce their costs and increase their productivity and potentially if conferring derogation on other farmers has a negative impact on their willingness to innovate. This seems unlikely in the four year derogation window.

Other competitive effects are likely to arise in the milk processing industry. The derogation will mitigate the risk of supply falling short of demand in specific regions. This is discussed in more detail in section 2.3.2.

Small Firms Impact Test

The impact assessment for the Nitrates Pollution Prevention Regulations identified that virtually all farms were affected by the Nitrates Regulations were expected to be small and medium enterprises (SMEs).

Without the derogation each farm is expected to the following effects:

- The additional costs of storage
- Additional costs of spreading
- Cost of reducing stocking rates
- Mitigation available from more efficient slurry handling
- Administrative burdens
- Cost of replacing rain guns used for slurry spreading
- Costs to a small number of grassland farmers by the reduction in Nmax for grass from 330kg N/ha to 300kg N/Ha.

However with the derogation these costs are expected to be reduced. Given that all farmers are SMEs and the costs do not fall disproportionately on any farmers, the impact on small firms is negligible.

Legal Aid

The derogation does not establish any new offences. However, as it relaxes one of the rules established by the Nitrate Pollution Prevention Regulations 2008, it reduces the likelihood of an offence being committed under these Regulations.

Sustainable Development

The derogation is of crucial importance to the economic viability of the dairy sector. The proposals represent a balanced and workable derogation that will allow farmers to make the most of grass-based production, whilst also protecting water quality and ensuring we achieve the environmental objectives of the Nitrates Directive.

Carbon Assessment

Impacts of the policy on greenhouse gas emissions (as CO2 equivalent) is summarised in the main section of the Impact Assessment.

Other Environment

Impacts of the policy on the losses of a range of pollutants is summarised in the main section of the Impact Assessment together with a description of how this is likely to affect biodiversity, water quality etc.

Health Impact Assessment

Emissions of ammonia and nitrate into the environment can have a detrimental impact on human health.

The health impact associated with the predicted increase in ammonia emissions has not been costed.

Nitrates are removed from drinking water before being supplied to the public for consumption. The policy is aimed directly at protecting public water supplies from nitrate pollution. It is likely to reduce the treatment costs faced by the water industry, which may be passed onto consumers.

Race, Disability and Gender Equality

An initial screen was undertaken of the regulations' effect on race, disability and gender equality and none were identified.

Human Rights

The Regulations provide a process for farmers to appeal against the rejection of their application for a derogation.

Rural Proofing

The policy is specifically aimed at the agricultural sector. The impacts have been considered in detail within the IA.