Nutrients Action Programme 2019-2022 Guidance Booklet

***Sustainability** at the heart of a living, working, active landscape valued by everyone.*

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You can download this guidance booklet from our website.
Follow this link: www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022

Foreword

The Nutrient Action Programme Regulations (Northern Ireland) 2019 *and the Nutrient Action Programme (Amendment) Regulations (Northern Ireland) 2019 (NAP Regulations)* provide continued operation of measures to improve the use of agricultural nutrients on farms and reduce their impact on Northern Ireland's water environment.

This guidance booklet provides details of what you are required to do to comply with the Nutrients Action Programme effective from 11 April 2019. The guidance booklet replaces the 'Nitrates Action Programme 2015-2018 and Phosphorus Regulations Guidance Booklet'.

For ease of reference, the guidance is split into:

Introduction - contains brief background information on the Regulations.

Summary Table - outlines the measures contained in the Regulations.

Key Changes - outlines the key changes from the previous NAP Regulations to the current legislation.

Sections 1 - 10 - details the requirements of the NAP Regulations.

Section 11 - signposts further help and training.

Section 12 - explains inspection and enforcement procedures for the Regulations.

Key Definitions and Glossary - explains the terms and abbreviations used in the booklet.

Annexes A-V - gives additional information to assist in understanding and complying with the Regulations.

Please note:

- **Sections 1 - 12** are compiled in a question and answer format.
- Words or phrases whose meanings are defined in the "Key Definitions" section are highlighted in italics when they appear in the document for the first time.
- The Nutrient Action Programme Regulations (Northern Ireland) 2019 are referred to throughout this guidance as the NAP Regulations.
- Guidance contained in the AHDB Nutrient Management Guide (RB209) (latest edition) published by the Agriculture & Horticulture Development Board (AHDB) in 2017 and subsequent updates, relating to phosphate recommendations for *grassland*, is superseded by the recommendations set out in **Annex J** of this guidance.
- Guidance contained in the *Code of Good Agricultural Practice (CoGAP)* for the Prevention of Pollution of Water, Air and Soil (published by the Department of Agriculture and Rural Development (DARD) in 2008), referring to the NAP and Phosphorus Regulations, is superseded by this guidance.

Further related guidance and information

Further related guidance booklets and workbooks including:

- A summary leaflet for the Nutrients Action Programme 2019-2022 Regulations;
- A Nutrients Action Programme 2019-2022 Workbook;
- A Nutrients Action Programme Derogation Guidance Booklet;
- A Nutrients Action Programme Derogation Fertilisation Plan; and
- A Nutrients Action Programme Derogation Fertilisation Account

are all available online at: www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022

You can also access the 'College of Agriculture, Food and Rural Enterprise (CAFRE) Farm Nutrient Calculators' by logging onto: www.daera-ni.gov.uk/onlineservices

CAFRE offer information and training courses to help farmers understand the Regulations. To register your interest, please contact CAFRE by calling 0300 028 4291 or Email: enquiries@cafre.ac.uk

Information on Cross-Compliance is available through the documents:

- Northern Ireland Cross-Compliance Verifiable Standards (Summary Version).
- Northern Ireland Cross-Compliance Verifiable Standards (Full Version).

which are available online at: www.daera-ni.gov.uk/articles/cross-compliance

The Code of Good Agricultural Practice for the Prevention of Pollution of Water, Air and Soil (CoGAP) is available online at:
www.daera-ni.gov.uk/publications/code-good-agricultural-practice-cogap

The Code of Good Agricultural Practice for the Reduction of Ammonia Emissions is available online at:
www.daera-ni.gov.uk/publications/code-good-agricultural-practice-reduction-ammonia-emissions

The NAP Regulations are available online at:

- NAP Regulations 2019 - www.legislation.gov.uk/nisr/2019/81/data.pdf

Additional information and guidance can be obtained from the points of contact provided in **Annex V.**

Contents

Typical Annual NAP Regulations Calendar

Date	Activity
31 January	Deadline for: • Submission of records to NIEA of any exports of organic manure for the previous calendar year.
Midnight 31 January	End of closed period for spreading all fertiliser and manure (Increased buffer zones and reduced application rates continue until end of February).
1 March	Deadline for **derogated farms** for: • Submission of *derogation application* to NIEA. • Completion of fertilisation plan (to be kept on farm for inspection). • Submission of fertilisation account, for the previous calendar year, to NIEA.
15 June	For **derogated farms** only: At least 50% of *slurry* produced on the holding must be applied by 15 June. Slurry must be applied using *Low Emission Slurry Spreading Equipment* (LESSE) after 15 June.
30 June	• Completion date for records for the period 1 January to 31 December of the previous year.
1 September	After harvesting any crops: • the stubble of the harvested crop must remain in the land; or • the land sown with a crop which will take up N from the soil, or where soil or weather conditions prevent a subsequent crop; from being sown, appropriate measures put in place to limit soil erosion, until 15 January next year. For **derogated farms** only: *Livestock manures* shall not be spread in the *autumn* before grass cultivation.
Midnight 15 September	Start of closed period for spreading: • Chemical N and *phosphate* fertiliser to grassland. • Any *chemical fertiliser* to any land for crops other than grass unless there is a demonstrable *crop requirement*.
Midnight 30 September	• Buffer zones for spreading slurry are increased; • Maximum slurry application rates are reduced.
Midnight 15 October	Start of closed period for spreading: • Organic manure, apart from *farmyard manure and dirty water,* to any land.
Midnight 31 October	Start of closed period for spreading farmyard manure to any land.

Introduction

A number of water quality problems affect the rivers, *lakes* and groundwaters of Northern Ireland and extend into the surrounding marine waters. The largest and most widespread of these is nutrient enrichment arising from too much nitrogen (N) and phosphorus (P) entering the water environment. This can cause an undesirable disturbance to the water's ecology; including excess plant growth and oxygen depletion known as *eutrophication*. In Northern Ireland, agriculture is a major source of excess nutrients entering the water environment and one of the main measures to address this is through implementation of the EU Nitrates Directive (91/676/EEC). The waste water treatment and industrial sectors also contribute to water quality issues and action is being focused at these sectors through the implementation of other directives.

The Nitrates Directive (the Directive) aims to improve water quality by protecting water against eutrophication and pollution caused by nitrates from agricultural sources. In particular, it promotes better management of animal manures, *chemical nitrogen fertilisers* and other nitrogen - containing materials spread onto land. To meet the requirements of the Directive, the first Nitrates Action Programme (NAP) to cover the whole of Northern Ireland was established for 2007-2010 through the Nitrates Action Programme Regulations (Northern Ireland) 2006. The aim of the NAP is to improve the use of nutrients on farms and, as a result, improve water quality throughout Northern Ireland. At the same time the Phosphorus (Use in Agriculture) Regulations (Northern Ireland) 2006 were introduced to support these objectives.

Recent water quality data indicates that the long term downward trend in phosphorus levels in freshwaters has stopped. In some areas, phosphorus levels are increasing due to inputs from agriculture. The probable causes include more concentrate feed inputs as a result of intensification and use of chemical phosphorus fertiliser on NI farms. Compound chemical fertiliser containing phosphorus is at times being used where it is not required. This is a major concern, as many water bodies in Northern Ireland do not meet targets for good water quality due to elevated phosphorus levels.

The Directive also requires action programmes to be reviewed and, where necessary, revised, at least every four years. The Action Programme was reviewed and revised in 2010, 2014 and 2018 and is currently implemented through the 2019 NAP Regulations and subsequent NAP Amendment Regulations 2019. The Action Programme has been renamed the Nutrients Action Programme, as the previous Nitrogen and Phosphorus Regulations are now combined into a single set of Regulations.

The NAP Regulations are the responsibility of the Department of Agriculture, Environment and Rural Affairs (DAERA) and are enforced by the Northern Ireland Environment Agency (NIEA), an agency within DAERA. The Regulations are supported by a water quality monitoring programme carried out by NIEA. Additional monitoring and research funded by DAERA and carried out by the Agri-Food and Biosciences Institute (AFBI). Guidance and training is offered to farm businesses by DAERA's College of Agriculture, Food and Rural Enterprise (CAFRE).

Complying with the Regulations

Legal requirements

The rules set out in the NAP Regulations apply to all farm businesses in Northern Ireland. If you are undertaking any of the activities covered by the Regulations you have a legal obligation to comply with the rules; **regardless of whether or not you are claiming any Area-Based Scheme payments.** Failure to comply may lead to legal action being taken against your business by NIEA.

Cross-Compliance

The Nitrates Directive also underpins one of the Cross-Compliance Statutory Management Requirements (SMR 1: Protection of Water against Nitrate Pollution). Therefore, for farm businesses claiming payments under Area-Based Schemes (including the *Basic Payment Scheme* (BPS)), non-compliance with the NAP Regulations is a breach of Cross-Compliance conditions and may lead to a reduction in payments claimed under the Area-Based Schemes. The Area-Based schemes covered by Cross-Compliance are listed in key definitions.

Table 1: Summary of the NAP Regulations summarises the measures of the NAP Regulations and groups them into the verifiable standards that must be adhered to under Cross-Compliance.

Important Changes from 2020 - UK Exit from the EU (Brexit) Legislation

The Withdrawal Agreement setting the terms for the withdrawal of the UK from the EU disapplies the EU direct payments regulation (Regulation No. 1307/2013) and associated regulations in the UK for the 2020 scheme year.

However, the Withdrawal Agreement requires the UK to operate direct payments schemes in 2020 which are equivalent to the EU schemes. Therefore the EU direct payment regulations are reapplied in UK law for the 2020 scheme year by the Direct Payments to Farmers (Legislative Continuity) Act.

Any references in the Cross-Compliance Verifiable Standards are to be taken as references to those provisions, as retained in UK law, for the 2020 scheme year by the Direct Payments to Farmers (Legislative Continuity) Act and corresponding secondary legislation.

Check the DAERA website www.daera-ni.gov.uk for updates beyond 2020.

Details of all Cross-Compliance requirements may be found on-line at: www.daera-ni.gov.uk/articles/cross-compliance

Other regulatory requirements

This guidance details your obligations under the NAP Regulations. Some of the issues involved interact with other environmental and agricultural legislation. These are highlighted throughout the booklet and include Pollution Prevention and Control (PPC) licensing, Waste Management licensing, Sewage Sludge regulation and Animal By-Product legislation. Where applicable, you must ensure that all other regulatory requirements are met.

Health and safety considerations

A number of the farming activities covered by the NAP Regulations have health and safety (H&S) considerations; in particular, activities associated with *livestock* manure storage and spreading of *chemical fertilisers* and manures. As with any farm work, there is a need to ensure that safe working systems are put in place for carrying out such activities.

Specific advice on certain activities is included throughout this booklet in yellow boxes.

General advice on farm safety and further information on best practice for safe slurry handling is available on the Health and Safety Executive website at: www.hseni.gov.uk

Advice on on-farm fire safety is available from the Northern Ireland Fire and Rescue Service by telephone (028 9266 4221) or on their web-site at: http://www.nifrs.org/

Key changes

The key changes from the previous NAP Regulations to the current legislation are summarised below.

NAP Regulations

- The buffer zones for spreading slurry are increased and the maximum slurry application rate is reduced from midnight 30 September - 15 October and during February.
- Low Emission Slurry Spreading Equipment (LESSE) methods must be used:
    - From 1 February 2020 for spreading *anaerobic* digestate.
    - From 1 February 2021 by *slurry contractors*.
    - From 1 February 2022 on cattle farms with 200 or more cattle livestock units and pig farms with a total annual livestock manure nitrogen production of 20,000 kg or more from pigs.
- Nitrogen and phosphorus excretion rates for poultry production systems and for cattle have been revised.
- New maximum phosphate fertiliser application rates for *extensively managed grassland* have been introduced.
- Livestock Manure and *Silage Effluent* Storage Requirements now also include anaerobic digestate fibre.
- All new above ground slurry stores must be sited at least 50 m from any *waterway* and all new slurry stores (excluding lagoons) must be fitted with a cover.
- Where there could be a significant risk of pollution occurring from their use. Supplementary feeding sites must be a minimum of 20 m from any waterway from 1 January 2020 and supplementary livestock drinking points must be a minimum of 10 m from any waterway from 1 January 2022.
- A fertilisation plan must be prepared and kept up to date by all grassland farms using chemical phosphorus fertiliser, and all farms using phosphorus rich manure and anaerobic digestate. A soil analysis is required.
- Farms applying anaerobic digestate will require a nutrient content analysis.

Phosphorus

The measures controlling the application of chemical phosphorus fertiliser to land are now a Cross-compliance requirement. It will be an offence not to comply with the additional measures and a breach may result in a penalty being applied to your Single Farm Payment.

Table 1 - Summary of Nutrients Action Programme 2019-2022

(Wording in GREEN shows changes from the 2015-2018 NAP and 2014 Phosphorus Regulations).

Verifiable standards	Key Measures
Closed Spreading Periods	• Chemical nitrogen and phosphorus fertiliser must not be applied to grassland from midnight 15 September to midnight 31 January. • All types of chemical fertiliser must not be applied to arable land from midnight 15 September to midnight 31 January, unless there is a demonstrable crop requirement. • Organic manures, including slurry, *poultry litter,* digestate, sewage sludge and abattoir waste, must not be applied to any land from midnight 15 October to midnight 31 January. • Farmyard manure (FYM) must not be applied to any land from midnight 31 October to midnight 31 January. • There is no closed spreading period for dirty water.
Land Application Restrictions	• All fertilisers, chemical and organic and including dirty water, must not be applied: - on *waterlogged* soils, flooded land or land liable to flood; - on frozen ground or snow covered ground; - if heavy rain is falling or forecast in the next 48 hours; - on steep slopes (with an average incline of 20% or more on grassland 15% or more on all other land) where other significant risks of water pollution exist. The risk factors to be considered include the proximity to waterways/lakes, type and amount of fertiliser to be applied, soil conditions, weather forecast and time to incorporation if applied to arable land. - on all other land (with an incline of less than 20% for grassland or less than 15% for all other land) where significant risks of *water pollution* exist. The risk factors to be considered include the proximity to waterways/lakes, amount to be applied, soil conditions, weather forecast and time to incorporation if applied to arable land. • Prevent entry of fertilisers to waters and ensure application is accurate, uniform and not in a location or manner likely to cause entry to waters. • All types of chemical fertiliser must not be applied within 2 m of any waterway. • Organic manures including dirty water must not be applied within: - 20 m of lakes; - 50 m of a borehole, spring or well; - 250 m of a borehole used for a public water supply; - 15 m of exposed cavernous or karstified limestone features; - 10 m of a waterway other than lakes; this distance may be reduced to 3 m where slope is less than 10% towards the waterway and where organic manures are spread by bandspreaders, trailing shoe,

Verifiable standards	Key Measures
Land Application Restrictions	trailing hose or soil injection OR where adjoining area is less than 1 ha in size OR not more than 50 m in width. • Application rates: - No more than 50 m^3 per ha (4,500 gal per ac) or 50 tonnes ha (20t per ac) of organic manures to be applied at one time, with a minimum of three weeks between applications; - No more than 50 m^3 per ha (4,500 gal per ac) of dirty water to be applied at one time, with a minimum of two weeks between applications. • From midnight 30 September - 15 October and during February: - The buffer zones for spreading slurry are increased: • from 10 m to 15 m of any waterway • from 20 m to 30 m for lakes The maximum slurry application rate is reduced from 50 m^3 per ha (4500gal per ac) to 30 m^3 per ha (2700 gal per ac). • Slurry can only be spread by inverted splashplate, bandspreaders, trailing shoe, trailing hose or soil injection. • Dirty water to be spread by same methods as slurry and by irrigation. • Sludgigators must not be used. • Low Emission Slurry Spreading Equipment (LESSE) includes bandspreading, dribble bar, trailing hose, trailing shoe, soil incorporation or soil injection methods. LESSE must be used: - from 1 February 2020 for spreading anaerobic digestate. - from 1 February 2021 by slurry contractors. - from 1 February 2022 on cattle farms with 200 or more cattle livestock units and pig farms with a total annual livestock manure nitrogen production of 20,000 kg or more from pigs. - where it is not practical to spread on a field using LESSE due to slope, slurry can be spread using an inverted splash plate on that field. A record of the field number and the reason for spreading using a splash plate must be kept for inspection.
Livestock Manure Nitrogen Limits	• 170 kg N per ha per year farm limit. • Farms with at least 80% grassland may apply annually on or before 1 March to NIEA for a derogation to permit the *land application* of up to 250 kg N per ha per year from *grazing livestock* manure. Additional conditions and Cross-Compliance verifiable standards will apply. Further guidance is available from NIEA. • From 11 April 2019 revised nitrogen and phosphorus excretion rates for poultry production systems must be used. • From 1 January 2020 revised nitrogen and phosphorus excretion rates for cattle must be used.

Verifiable standards	Key Measures
Overall Nitrogen Fertiliser Limits	• Maximum kg N per ha on grassland (apart from N in livestock manure): - Dairy farms* 272 (8¼ bags** per ac) - Other farms 222 (6¾ bags** per ac) (When applying chemical *nitrogen fertiliser*, nitrogen from organic manures other than livestock manure and anaerobic digestate containing digested livestock manure must be subtracted.) • For non-grassland crops, maximum nitrogen applied (from all types of fertiliser, including livestock manure) must not exceed crop requirement and, for certain *arable crops*, an N-Max limit applies to the total crop area. ** More than 50% of N in livestock manure comes from dairy cattle.* *** Approximate number of 50 kg bags of a 27% nitrogen type chemical fertiliser.*
Restrictions on Phosphate Application	• Organic manure with more than 0.25 kg of total phosphorus per 1 kg of *total nitrogen* (e.g. some poultry litter, pig FYM and anaerobic digestate) can only be applied where soil analysis shows there is a crop requirement for phosphorus. From 1 January 2020 a fertilisation plan must be prepared, retained and made available on the holding. • From 1 January 2020 new maximum phosphate fertiliser application rates (kg P_2O_5 per ha) for extensively managed grassland (receiving under 60 kg chemical N/ha/year or under 120 kg manure N per ha per year loading) will apply.
Livestock Manure, Silage and Silage Effluent Storage Require-ments	• 26 weeks livestock manure storage capacity for pig and poultry enterprises. • 22 weeks for other enterprises. • When certain criteria are met there are allowances for out-wintering, animals on bedded accommodation, separated cattle slurry, renting additional tanks and poultry litter stored in a *midden* or field heap and exporting manure to approved outlets. • Livestock manure and silage effluent storage must be maintained and managed to prevent seepage or run-off. *Silage* and slurry stores constructed or substantially modified after 1 December 2003 must comply with certain construction standards (set out in the NAP Regulations) and be notified to NIEA at least 28 days before they are brought into use. • Silage bales must be stored at least 10 m from any waterway and stored and managed in such a way as to prevent seepage into the waterway. • FYM, poultry litter and anaerobic digestate fibre: - may be stored in middens with *adequate effluent collection facilities.*

Verifiable standards	Key Measures
Livestock Manure, Silage and Silage Effluent Storage Require-ments	- may be stored in a field heap where they are to be applied, for a maximum of 120 days; - field storage of poultry litter and anaerobic digestate fibre must be notified to NIEA prior to placement in the field. • FYM, poultry litter and anaerobic digestate fibre field heaps must not be stored: - in the same location of the field year after year; - within 50 m of a borehole, spring or well; - within 250 m of a borehole used for a public water supply; - within 50 m of exposed cavernous or karstified limestone features; - on land that is waterlogged, flooded or likely to flood. • FYM field heaps must not be stored within 20 m of any waterway and 50 m of lakes. • Poultry litter and anaerobic digestate fibre field heaps must not be stored within 100 m of lakes and 40 m of any waterway. • Poultry litter and anaerobic digestate fibre field heaps must be covered with an impermeable membrane as soon as possible and within 24 hours of placement in the field. • Provide storage for dirty water during periods when conditions for land application are unsuitable. • From 1 January 2020 new above ground slurry stores must be sited at least 50 m from any waterway and all new slurry stores (excluding lagoons) must be fitted with a cover.
Land Manage-ment	• From harvest of all crops until 15 January of the following year, the *controller* must manage the land to ensure minimum soil cover and to minimise soil erosion and nutrient run off. • Residues of crops harvested late must be left undisturbed until just before sowing the following spring. • From 1 January 2020 supplementary feeding sites must be a minimum of 20 m from any waterway where there could be a significant risk of pollution occurring from their use. • From 1 January 2022 supplementary livestock drinking points must be a minimum of 10 m from any waterway where there could be a significant risk of pollution occurring from their use.
Record keeping	• Agricultural area, field size and location. • Cropping regimes and areas, Soil Nitrogen Supply (SNS) index for crops other than grassland.

Verifiable standards	Key Measures
Record keeping	• Livestock numbers, type, species and time kept. • Organic and chemical fertiliser details including imports and exports. • From 1 January 2017 - evidence of a crop phosphorus requirement from soil analysis if organic manure with over 0.25 kg total phosphorus per 1 kg total nitrogen is applied. • From 1 January 2020 a fertilisation plan must be prepared and kept up to date by all grassland farms using chemical phosphorus fertiliser, and all farms using phosphorus rich manure e.g. some poultry manures, pig FYMs and anaerobic digestate. A soil analysis is required. • From 1 January 2020 farms importing anaerobic digestate will require a nutrient content analysis. • Storage capacity and, where applicable, details of rental agreements, notification to store poultry litter and or anaerobic digestate fibre in field heaps and associated evidence to support allowances to reduce capacity. • Evidence of control over the agricultural area and the right to graze common land. *Many of these records already exist on farms, for example, SAF forms, farm maps, herd and flock records and fertiliser receipts. Nitrogen and phosphorus requirements for grassland are set out in the NAP Regulations. Nitrogen and Phosphorus requirements for other crops should be determined using the AHDB Nutrient Management Guide (RB209).* Records to be ready by 30 June each year for the period 1 January to 31 December of previous year. • Records to be available for inspection from previous five calendar years. • Records relating to the export of organic manure to be submitted annually to NIEA by 31 January of the following year. • If you are operating under an approved derogation, you must keep your fertilisation plan on farm and have it ready for inspection by 1 March for that calendar year. Your fertilisation account for the previous calendar year must be submitted to NIEA by 1 March. • If you are applying chemical phosphorus fertiliser, applying organic manures with a high phosphorus content or applying anaerobic digestate you must prepare your fertilisation plan and retain it on farm and have it available for inspection by 1 March for that calendar year.
Cross Compliance	• Enforcement Notices issued under the NAP Regulations must be complied with. The measures controlling the application of chemical phosphorus fertiliser to land are now a Cross-compliance requirement.

Section 1 - General Information

1.1 When do the Regulations become effective?

The Nutrient Action Programme Regulations (Northern Ireland) 2019, commonly referred to as the NAP Regulations, covering the period 2019 to 2022 became effective on 11 April 2019. This programme replaces and updates the previous 2015-2018 NAP and incorporates the previous Phosphorus (Use in Agriculture) Regulations (NI) 2014.

Commission Decision 2019/1325/EU in March 2019, granted approval for Northern Ireland to operate a derogation allowing the application of livestock manure up to a limit of 250 kg nitrogen per hectare per year, under certain conditions, on farms in Northern Ireland with at least 80% grassland. The Nutrient Action Programme (Amendment) Regulations (Northern Ireland) 2019 came into operation on 15 October 2019 to implement the Commission Decision on the derogation and facilitate several technical amendments.

1.2 In what situations do the Regulations apply?

The measures in the NAP Regulations which relate to areas of land (for example, closed spreading periods, livestock manure nitrogen loadings) apply to all agricultural land in Northern Ireland. This includes grassland, land used for arable and horticultural crops and land used for orchards and short rotation coppice. It does not include long-term forestry land. Many of the measures have separate rules for grassland and land other than grassland; this is because of differences in crop nutrient behaviour and risks of water pollution between different land uses.

The measures in the Regulations which relate to storage of manures, dirty water, silage and silage effluent apply to any farm facility where these are stored.

1.3 Who is responsible for complying with the rules?

There are two sets of people who can be considered responsible for complying with the NAP Regulations, depending on the activity being undertaken and the circumstances. These are:

- The controller
- An *appropriate person*

1.3.1 The controller

In general, for the purposes of the NAP Regulations, the “controller” of the land is the person charged with management of the holding for the calendar year in question and is responsible for complying with the Regulations. There can be only one controller for a calendar year.

Where direct payments are claimed - where direct agricultural aid payments are being made, "controller" has a similar meaning as "active farmer" has under the BPS. Therefore, the person claiming direct agricultural aid payments for the agricultural area is taken to be the controller. For this purpose, direct agricultural aid payments are the BPS and the Areas of Natural Constraint (ANC) Scheme.

Where direct payments are not claimed - In situations where direct agricultural aid payments are not being claimed by anyone on that parcel of land, the controller is deemed to be the person who enjoys the decision making powers, benefits and financial risks for the agricultural activity carried out on the land. For a landowner renting land out to a tenant, the party considered to be the controller would normally be the tenant as usually it is the tenant who enjoys these powers, benefits and risks. Where this is not clear, an assessment will be carried out by NIEA on a case by case basis.

Remember!

For claimants of Area-Based Scheme payments all eligible land farmed in Northern Ireland must be included on the SAF Form.

For claimants of the BPS, all land farmed which you are sure is eligible must be used to establish entitlements.

The scenario where no direct aid payments are claimed on land should only be relevant for farmers who do not submit a claim for BPS entitlements.

Farm businesses carrying on farming activities on land outside Northern Ireland will have to comply with any respective NAP for that country.

1.3.2 The appropriate person

For some regulations, in particular those concerned with record keeping and compliance with capacities and limits, the controller will be held responsible for any offence. For other regulations within the NAP Regulations, in particular those concerned with management and application of nitrogen fertiliser, an "appropriate person" will be held responsible for any offence.

The appropriate person might still be the controller, but could also be a person permitted by the controller to carry out, on their behalf, any activity covered by the Regulations (for example, a contractor, or an owner or user of storage facilities for livestock manure, silage or silage effluent).

In situations where more than one farm business uses the same yard and storage facilities, or carries out agricultural activity on the same fields, responsibility for an offence will be examined on a case by case basis by NIEA.

Some general examples of who would be held responsible for an offence under the NAP Regulations are outlined in **Table 2**. However, it should be noted again that, in any situation where a breach of the Regulations is identified, responsibility for an offence will be examined on a case by case basis by NIEA.

Table 2 - Some example scenarios of who could be held responsible for an offence under the NAP Regulations

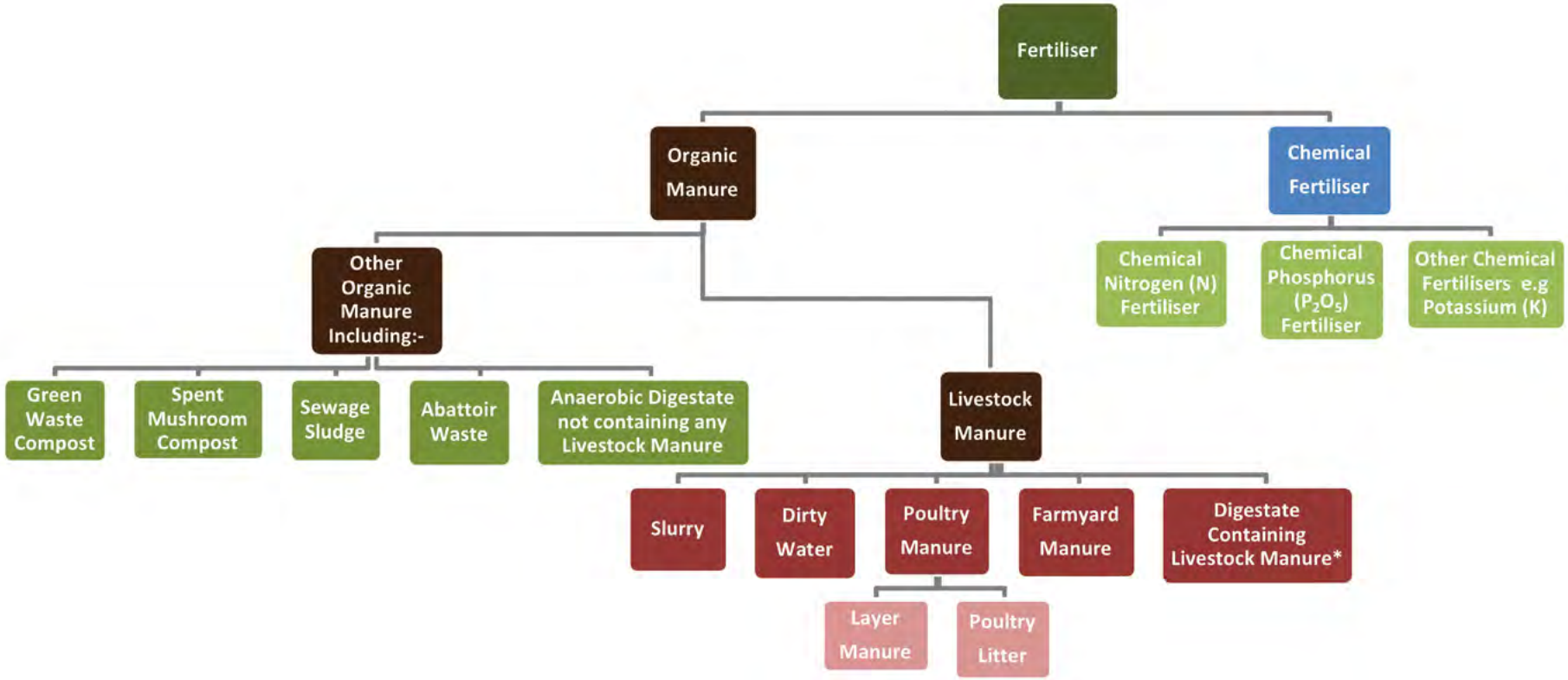
	Controller	**Other appropriate person (e.g. contractor, owner of slurry tank)**
Example breach scenario	**Responsible for offence?**	**Responsible for offence?**
Insufficient records kept to allow assessment of N loading.	Yes	No
Organic manure spread too close to waterway by contractor: - evidence that controller had instructed contractor to comply with NAP Regulations spreading distances.	No	Yes
Organic manure spread too close to waterway by contractor: - no evidence that controller had instructed contractor to comply with NAP spreading distances.	Yes	Yes
Rented slurry tank with structural crack in wall: - evidence in rental agreement that owner was responsible for maintenance.	No	Yes
Rented slurry tank with structural crack in wall: - evidence in rental agreement that controller was responsible for maintenance.	Yes	No

Breaches of the NAP Regulations will also be reported to the relevant section within DAERA who is responsible for applying any reductions in payments in respect of Area-Based Schemes (including the BPS) covered by Cross-Compliance. In most cases any penalty will be applied to the claimant to whose farm business the breach is related.

1.4 What is fertiliser?

Fertiliser, for the purposes of the NAP Regulations, is considered to be any substance containing plant nutrients which is applied to land to enhance crop growth. It includes chemical fertiliser and all types of organic manure including livestock manure as outlined in **Figure 1**.

Figure 1 - Fertiliser types and how they relate to each other



* Where anaerobic digestate contains livestock manure, the entire quantity of digestate will be treated by NIEA as livestock manure (for the purposes of nitrogen application limits etc.) unless the user produces evidence of the proportions and nutrient contents of feedstocks used in the digestion process.

1.5 What is anaerobic digestate?

Anaerobic digestion is a process which harnesses natural bacteria to treat biodegradable materials such as agricultural manure and slurry, food waste and sewage sludge. The anaerobic process produces a methane rich gas, which can be captured and used to generate electricity and heat. The digestate residue can be beneficially applied to farmland as fertiliser, or as a soil conditioner.

The application of anaerobic digestate to land must comply with the NAP Regulations. Please also note that, due to the range of anaerobic digestion feedstocks (e.g. livestock manures, green energy crops, food waste, abattoir waste) that can be used, the **use of digestate as fertiliser, may involve complying with Waste Regulations as well as NAP.**

Agricultural manure and slurry is not considered waste when it is used directly as a fertiliser on land. When agricultural manure and slurry is destined for a treatment process for example composting, biogas production or incineration, it is waste and will be subject to regulatory control. This is a requirement under the revised Waste Framework Directive 2008/98/EC, Article 2, 2 (b).

NIEA will not regulate anaerobic digestate as a waste if:

- the only feedstock to an AD plant is agricultural manure and slurry and it is spread as fertiliser on agricultural land; or
- agricultural manure and slurry is only mixed with a non-waste feedstock, for example, vegetable waste or green energy crops grown specifically for AD, and it is spread as a fertiliser on agricultural land. Examples of green energy crops include grass silage, maize silage, sugar beet and potatoes; or
- the digestate complies with the Anaerobic Digestate Quality Protocol www.biofertiliser.org.uk/pdf/Anaerobic-Digestion-Quality-Protocol.pdf

If the anaerobic digestate does not fall under one of the above options, it is waste. The waste authorisation, at the following link, must be in place to apply it to land to utilise its fertiliser value. The waste authorisation is available at www.daera-ni.gov.uk/articles/land-treatment-agricultural-benefit-or-ecological-improvement-paragraph-9-exemption

A summary of common situations, highlighting when a waste authorisation is required and the limits for nitrogen and phosphate applications for anaerobic digestates are set out in **Annex S**.

Section 2 - Your Duty Not to Cause Pollution

The NAP Regulations place a general, overarching, duty on controllers, and those working for them, to prevent water pollution by ensuring that fertiliser (both chemical and organic) does not enter waterways or water in underground waterbodies (groundwater). There are two elements to this that you should be aware of:

- preventing direct or indirect entry of fertiliser into any surface waterbody; and
- preventing direct or indirect entry, or risk of entry, of fertiliser into any underground waterbody.

Entry of fertiliser into both surface and underground waterbodies can happen during fertiliser spreading activities, but can also happen around the yard in relation to maintenance and management of storage facilities, livestock housing and yard areas. Some examples of situations where pollution problems may occur are given below.

Further guidance on management of these areas can be found in CoGAP.

- Middens - inadequate or no effluent collection, cracks/holes in the walls/base, overfilling.
- Silage effluent - poor management of diverters, blocked channels, leaking silos (cracks, unsealed floors).
- Slurry - overflowing tanks, uncollected run-off from livestock houses and holding yards, unprotected storm drains in yards, badly cracked yards.

See **Annex A** for some examples of what water pollution might look like. See **Annex B** for some examples of what run-off from yards, livestock housing and silos might look like.

2.1 Direct or indirect entry of fertiliser into surface waterbodies

When spreading manures or chemical fertilisers you must ensure they do not enter surface waterbodies. Compliance with the rules detailed in **Section 4** should minimise any risk of this happening.

You must also ensure that run-off from areas such as livestock housing and walkways, and sheds and yards used by livestock or to store fertiliser and manures does not enter waterways, storm drains or drainage ditches.

Remember!

As well as lakes, rivers and streams, surface waterbodies include storm drains and drainage ditches.

2.2 Direct or indirect entry, or risk of entry, of fertiliser into underground waterbodies

As for surface waterbodies, when spreading manures or chemical fertilisers you must ensure they do not enter underground waterbodies (groundwater). This could happen through entry of the manure or fertiliser into a well, borehole or spring. It could also happen through spreading manure or fertiliser on ground with shallow soil cover, exposed rock or limestone features such as swallow-holes and collapse features.

Again, compliance with the rules detailed in **Section 4** should minimise any risk of this happening.

In yard areas there is a risk of direct or indirect entry of fertiliser into underground waterbodies from downwards seepage through, for example, cracks in silo or slurry tank floors, severe cracks in yard concrete, housing of livestock on permeable floors and storage of manures on permeable floors. Compliance with the rules set out in **Section 8.2** should minimise these risks.

Pollution prevention - what will happen during an inspection?

NIEA staff will give you the option to accompany them during their inspection of your land and farm facilities.

They will, in particular, wish to check areas of your land which appear to be most vulnerable to pollution. This would, for example, include fields beside waterways, boreholes, wells or springs and waterways close to yards.

In your yard they will wish to examine manure and silage storage facilities and arrangements for effluent and run-off collection.

NIEA staff can also inspect your land and yard facilities in relation to off-farm pollution incidents which they believe can be traced back to a problem on your farm.

Photographs will be taken as a record of the inspection and, in some cases, water or soil samples may be taken.

Section 3 - Closed Spreading Periods

3.1 What are the closed spreading periods?

Applying nutrients to grass or crops that are not growing can lead to these valuable nutrients leaching or running off into waterways. One of the main measures within the NAP is to prohibit the application of fertilisers during the months when the risk of this is highest. This period is called a closed spreading period. The closed spreading periods in force for different types of fertiliser are summarised in **Table 3**.

Table 3 - Closed spreading periods for different types of fertiliser

Fertiliser type	Closed period starts	Closed period ends
All types of chemical fertiliser (see 3.2)	**Midnight 15 September**	**Midnight 31 January**
Slurry, poultry litter and other organic manures, for example sewage sludge, abattoir waste and anaerobic digestate.	**Midnight 15 October**	**Midnight 31 January**
Farmyard manure	**Midnight 31 October**	**Midnight 31 January**
Dirty water	**No closed spreading period but the land application restrictions listed in Section 4 apply to spreading all fertilisers, including dirty water.**	

3.2 Are there any exceptions to the closed spreading period?

Yes, there are two exceptions to the closed spreading period; these are:-

- where there is a demonstrable requirement for chemical fertiliser for crops other than grass; and
- application of chemical potassium fertiliser to grassland.

3.2.1 Demonstrable arable/horticultural crop requirement for chemical fertilisers

Different types of chemical fertiliser can be applied to some crops other than grass during the closed period, if a crop need can be demonstrated. For example, winter cabbages may require a nitrogen top dressing and, on soils at P or K Index 0 and 1, cereal crops may require phosphate and/or potash at sowing. However, an autumn grass reseed or winter sown cereal does not require nitrogen fertiliser at sowing. There is no need to notify NIEA about chemical fertiliser applications because of demonstrable crop need, but it is advisable, in case of inspection, to keep a note for your records of the type and amount of fertiliser applied and the reasoning for it.

3.2.2 Application of chemical potassium (K) fertiliser to grassland

Potassium is supplied to growing crops as potash (K_2O). There is no closed period for application of *chemical potash fertiliser* to grassland (provided it is not blended with nitrogen or phosphorus fertiliser); however, the land application restrictions listed in **Section 4** apply to spreading of all fertilisers.

Potassium uptake and magnesium deficiency in cattle

High yielding silage crops have a very high demand for potash, especially when the soil K indices are low. In most cases this high requirement for potash for silage crops can be met with applications of slurry both in the autumn before the closed period and also in the spring. Where chemical fertiliser is needed to meet the crop requirement, it is recommended that the potash dressing for first cut silage be split between autumn and spring. This is to avoid excessively high applications in the spring which can result in luxury uptake of potassium by grass in preference to magnesium and can lead to deficiency of magnesium in cattle and cattle deaths.

Section 4 - Land Application Restrictions

4.1 Applying fertiliser

4.1.1 Are there restrictions on how I apply fertiliser?

Yes. All fertiliser types (including all types of organic manure and chemical fertiliser) must be applied as accurately and uniformly as possible and must not be applied in a location or manner, including dumping, which would make it likely that it will directly or indirectly enter a waterway or underground waterbody.

4.1.2 Are there conditions outside the closed spreading periods when I cannot apply fertiliser?

Yes. You must not apply fertiliser when:

- soil is waterlogged (this is when water appears on the surface of the land when pressure is added);
- land is flooded or likely to flood;
- soil is frozen;
- land is snow covered;
- *heavy rain* is falling or forecast within the next 48 hours;
- land is sloping and other significant risks of water pollution exist. Risk factors to be considered include the proximity to waterways, the time to incorporation, the type and amount of fertiliser being applied and the soil and weather conditions.

4.1.3 What counts as frozen soil?

Frozen soil is best considered as being when the ground surface is frozen and hard underfoot. A superficial 'grass frost' would not be considered to cause frozen ground. The Met Office is the UK's National Weather Service and provides forecasts for up to five days, at both a regional and local level. This information is available to the public through the internet (www.metoffice.gov.uk/), local press and media. Use this to assess forecast weather conditions.

4.1.4 What counts as heavy rain?

The Regulations define heavy rain as being more than 4 mm of rain per hour. In practical terms, continuous rainfall any heavier than a drizzle will meet the above definition, as will brief, intense showers. Again, refer to Met Office forecasts to assess the risk.

4.1.5 How do I measure sloping land?

There are two factors which are used to determine the steepness of a slope:

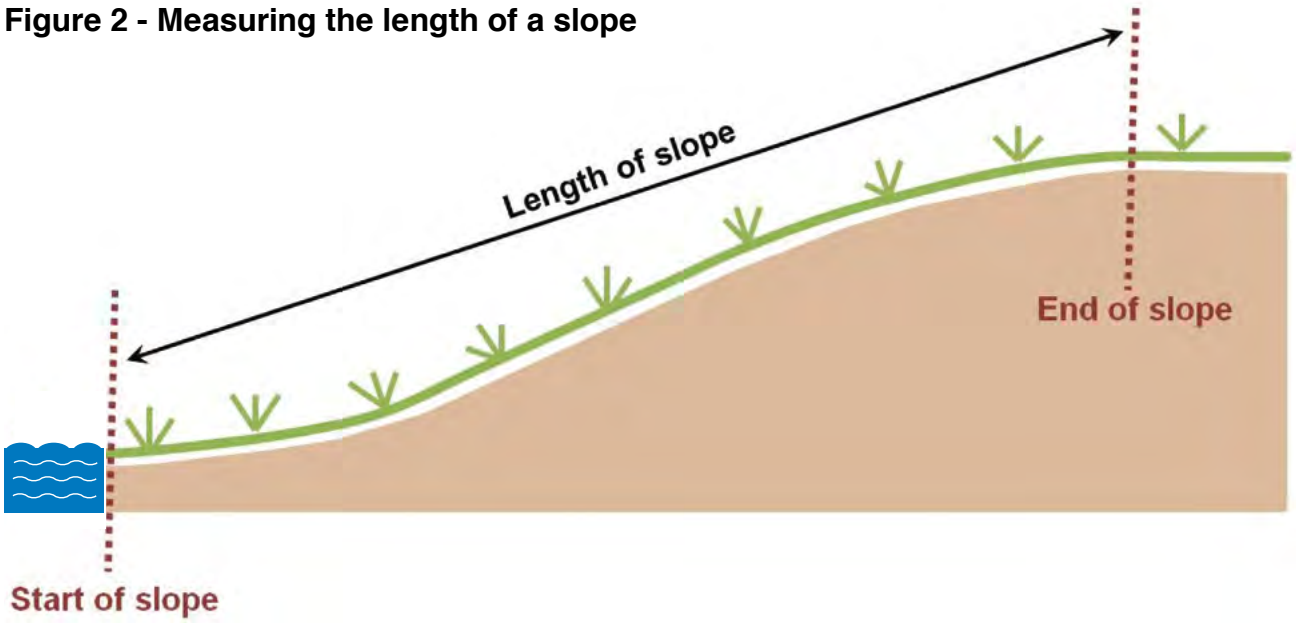
a. the length of the slope; and
b. the change in height over the length of the slope (percentage incline).

You are only required to make a visual assessment of a slope. However there are instruments and mobile apps available to assist with measuring the steepness of a slope, these may be used as an aid.

a. Length of the slope

The length of the slope can be measured from a distance of 100 m in length from the start of the slope to the end of the slope.

Figure 2 - Measuring the length of a slope



b. Change in height of the slope

The difference in the height of the slope must be measured from the start of the slope to the end of the slope.

The definition of steeply sloping land under the NAP Regulations varies depending on whether the land is:

- in grass;
- or in a crop other than grass.

4.1.6 Steep slopes on grassland

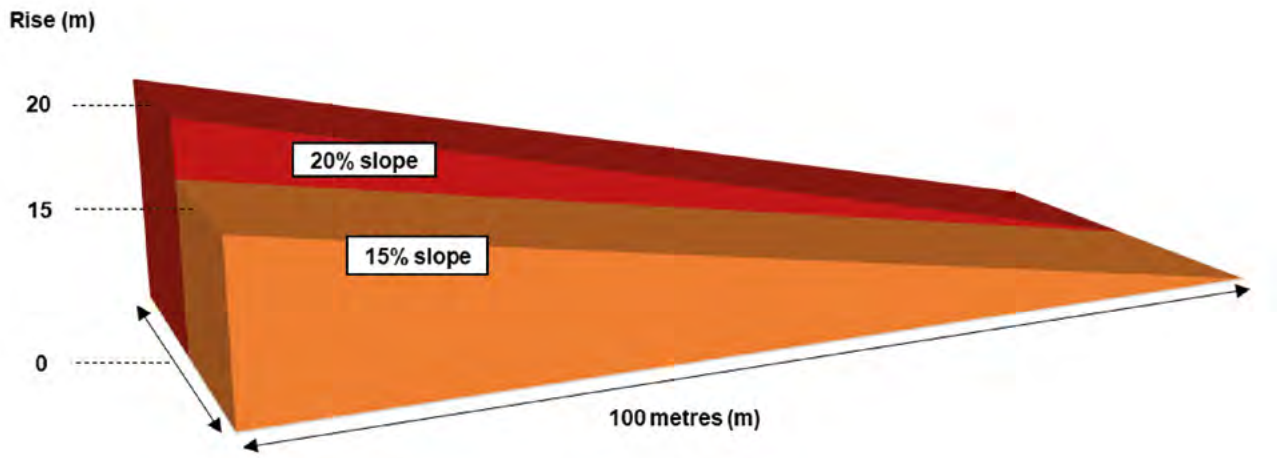
The NAP Regulations define grassland with an average incline of 20% or more as steeply sloping. This can also be expressed as an incline of 1:5. From Figure 3 you can see that a 20% slope provides a 1 m rise for every 5 m, or 20 m rise for every 100 m, travelled along a horizontal plane. For example if the length of the slope is 100 m and the average incline of the land is 20% or more, it is considered to be a steep slope.

4.1.7 Steep slopes on land other than grassland

The NAP Regulations define land other than grassland with an average incline of 15% or more as steeply sloping. This can also be expressed as an incline of 1:6.6.

From Figure 3 you can see that a 15% slope provides a 15 m rise for every 100 m travelled along a horizontal plane. For example if the length of the slope is 100 m and the average incline of the land is 15% or more, it is considered a steep slope.

Figure 3 - Diagram to demonstrate a 20% and 15% slope (not to scale)



Few areas of Northern Ireland suitable for fertiliser application are likely to meet the definition of steeply sloping, but in all situations you must remember to meet all of the other requirements of the NAP Regulations including preventing the entry of fertiliser (chemical or organic) into waterways i.e. avoiding pollution.

4.1.8 How do I assess the risk of spreading fertiliser on sloping land?

A risk assessment must be carried out on all sloping land near a waterway, to determine if you can spread fertiliser (including organic manures) on it. There are two different risk assessments for steeply sloping land and other sloping land. The following factors must be considered in making these risk assessments:

- type and amount of fertiliser being applied;
- time to incorporation of organic manures (land other than grassland only);
- proximity of waterways;
- soil conditions; and
- forecast weather conditions.

Additional detail about carrying out the spreading risk assessment on steeply sloping and other sloping land can be found in **Annex C.**

Remember!

You should not attempt to operate machinery on slopes unless you are sure it is safe.

4.1.9 How close can I apply chemical fertiliser to waterways?

Usually to within a minimum 2 m of a waterway. However on any sloping land the set back distances for spreading chemical fertiliser are increased depending on the outcomes of the risk assessments **(Annex C)**.

4.1.10 How close can I apply organic manure to waterways?

Usually, to within:

- 20 m of lakes;
- 10 m of any other waterway, including open areas of water, open field drains or any drain which has been backfilled to the surface with permeable material such as stone/aggregate. (This may be reduced to 3 m, provided the land has an average incline of less than 10% towards the waterway and the organic manures are spread by Low Emission Slurry Spreading Equipment (LESSE): band spreading, dribble bar, trailing shoe, trailing hose soil incorporation or soil injection methods; or where the adjoining area is less than 1 ha in size, or not more than 50 m in width);
- 50 m of a borehole, spring or well;
- 250 m of a borehole used for a public water supply; or
- 15 m of exposed cavernous or karstified limestone features (such as swallow holes and collapse features).

From midnight 30 September until midnight 15 October and during February the minimum spreading distances to waterways for organic manure are increased:

- from 20 m to 30 m from lakes;
- from 10 m to 15 m of any other waterway; from 3 m to 5 m if using LESSE as described above.

Where spreading is permitted on any sloping land set back distances for spreading organic manure are increased, depending on the outcomes of the risk assessments (**Annex C**).

Although not a mandatory requirement of the Regulations, it is also best practice to avoid spreading manures or chemical fertiliser on ground with shallow soil cover or exposed rock.

Photo 1 - Spreading poultry litter

These are often areas where groundwater is vulnerable to nutrient leaching, which means water quality may be affected and nutrients for crop growth may be lost.

Remember!

Organic manures include dirty water, slurry, poultry manure, farmyard manure, anaerobic digestate containing livestock manures and other organic manures such as abattoir waste, sewage sludge, spent mushroom compost, green waste compost and all other types of anaerobic digestate.

4.1.11 Is there a maximum single application limit for organic manures?

Yes. To minimise the potential of run-off of nutrients the following maximum application rates apply:

- Slurries 50 m^3 per ha (4,500 gallons per acre)
- Solid organic manures 50 tonnes per ha (20 tonnes per acre)

From midnight 30 September until midnight 15 October and during February the maximum slurry application rate is reduced:

- Slurries 30 m^3 per ha (2,700 gallons per acre)

These are maximum amounts and will vary depending of the outcome of the risk assessments. It is important to ensure that the quantity of organic manure applied does not lead to other breaches of the regulations, for example, by causing run-off of the manure into a waterway. Further guidance on best practice for manure application can be found in CoGAP.

4.1.12 How often can I apply organic manures?

A minimum of three weeks must be left between applications. This should avoid surface sealing and allow soil the time to absorb available nutrients. More frequent applications would smother herbage and saturate the soil and increase the chances of run-off and loss of nutrients.

4.1.13 Does slurry have to be spread by a particular method?

Yes. Slurry must be applied close to the ground using spreaders with, for example, inverted splashplates, or Low Emission Slurry Spreading Equipment (LESSE). LESSE includes trailing shoes, trailing hoses, soil injection or soil incorporation methods. Examples of some methods are shown below. **Sludgigator type spreaders and upward facing splashplates cannot be used.**

Photo 2 - Inverted splash plate

Photo 3 - Trailing shoe spreader

Photo 4 - Injection system

Photo 5 - Band spreader

4.1.14 Do I have to use Low Emission Slurry Spreading Equipment (LESSE)?

Yes, LESSE must be used in the following circumstances:

On derogated farms, all slurry spreading after 15 June each year must be done using LESSE.

From 1 February 2020 for spreading anaerobic digestate. This applies to anaerobic digester owners or any farmer importing digestate.

From 1 February 2021 by slurry contractors. The definition of a contractor is anyone receiving payment for spreading slurry, where they do not claim Basic Payment Scheme on that land.

From 1 February 2022 on farms with 200 or more cattle livestock units (LU) and farms with a total annual livestock manure nitrogen production of 20,000 kg or more from pigs. For mixed farms with cattle and pig enterprises (or any other livestock enterprise) the above calculations should be carried out independently and if either the total livestock units from cattle is over 200 or the N produced by pigs is 20,000kgN/year or more, then LESSE must be used for spreading all slurry produced by all enterprises on the holding. Do not include pigs (or any other livestock enterprise except cattle) in the livestock unit calculation or nitrogen produced by cattle (or any other livestock enterprise) in the pig nitrogen produced calculation.

Two examples of how to calculate livestock units are set out below.

Example 1: A 150 cow dairy herd and followers.

Stock type	Livestock Unit (LU)	Total Livestock Units (LU)
150 dairy cows	1.0	150
2 breeding bulls	1.0	2
5 cattle over 2 years	0.8	4
45 cattle 1-2 years	0.6	27
45 calves under 1 year	0.4	18
		= 201 LU Greater than 200 cattle Livestock Units, must use LESSE after 1 Feb 2022

Example 2: A 90 cow suckler and beef finishing farm.

Stock type	Livestock Unit (LU)	Total Livestock Units (LU)
90 dairy cows	0.8	72
3 breeding bulls	1.0	3
5 cattle over 2 years	0.8	4
125 cattle 1-2 years	0.6	75
125 calves under 1 year	0.4	50
		= 204 LU Greater than 200 cattle Livestock Units, must use LESSE after 1 Feb 2022

An example of how to calculate nitrogen produced by pigs is set out below.

Example 3: A 250 sow pig unit.

Stock type	N produced (kg)	Total N produced (kg)
250 sows	16	4,000
20 gilts	11	220
2 boars	18	36
250 sows x 28 pigs sold = 7000 pigs	2.3	16,660
		= 20,916 kg N Greater than 20,000 kgN/year from pigs, must use LESSE after 1 Feb 2022

Total livestock units should be estimated for the incoming year using the previous years stock numbers, available on APHIS online records (Nitrogen Loading Average) as a guide. A list of livestock units for each category of cattle is included in **Annex U**. Similarly estimate the nitrogen produced by pigs using the previous years stock numbers. The N Loading Calculator can be used to calculate the nitrogen produced by pigs available at www.daera-ni.gov.uk/onlineservices. These figures can then be used to guide your decision to use LESSE in the subsequent year. However consideration should be given if you intend to make significant changes to your farming practices which would affect your LU's or N produced figure.

Example 4: Guide to LESSE requirements

LESSE Calculation	Previous year actual LU	Current year estimated LU	Current year LESSE requirement (Y/N)
CATTLE (Cattle Livestock Units)	210	200 or above	Y
	210	Below 200	N
	190	200 or above	Y
	190	Remain below 200	N
	kg N	**kg N**	
PIGS (N produced from pigs kg N)	21,000	20,000 or above	Y
	21,000	Below 20,000	N
	19,000	20,000 or above	Y
	19,000	Remain below 20,000	N

Where it is not practical to spread on a field using LESSE due to slope, slurry can be spread using an inverted splash plate on that field. A record of the field number and the reason for spreading using a splash plate must be kept for inspection.

Benefits of using Low Emission Slurry Spreading Equipment (LESSE)

Using LESSE can lead to increased nitrogen availability, increased yields, and improved accuracy of application, reduced odour, reduced phosphorus run-off and potential savings on chemical nitrogen fertiliser.

4.2 Applying dirty water

Dirty water means water contaminated by organic manure, urine, effluent, milk and cleaning materials with a Biochemical Oxygen Demand (BOD) no greater than 2,000 mg per litre and a total of 0.5 kg N per m^3 nitrogen and 0.5% dry matter (DM) content. Pictures showing where dirty water could be produced are found in **Annex B**.

4.2.1 Is dirty water subject to a closed spreading period?

No. Dirty water may be applied to land throughout the year provided soil and weather conditions are suitable, as set out in **Section 4.1.2**. Provision for the safe storage of dirty water should be available for periods when conditions are not suitable for land application.

4.2.2 Is there a maximum single application limit for dirty water?

Yes. The maximum application for dirty water is 50 m^3 per ha (4,500 gallons per acre) in a single application, however, it is important to ensure that the quantity of dirty water applied does not lead to other breaches of the Regulations, for example, by causing run-off to a waterway. Further guidance on best practice for dirty water application can be found in CoGAP.

4.2.3 How often can I apply dirty water?

A minimum period of two weeks must be left between applications of dirty water. This should allow the soil time to absorb available nutrients. More frequent applications could saturate the soil and increase the chances of run-off and loss of nutrients.

4.2.4 How close can I apply dirty water to waterways?

The restrictions set out in **Sections 4.1.9 and 4.1.10** apply to all organic manure including dirty water.

4.2.5 Does dirty water have to be applied by a particular method?

Yes. Dirty water can be applied to land using the same methods allowed for slurry application. Additionally, dirty water can also be spread by irrigation systems. If an irrigation system is used, it is important to ensure that the system is moved often enough to avoid the risk of run-off, waterlogging and over application in irrigated areas.

Sludgigator type spreaders and upward facing splashplates cannot be used.

Land application restrictions - what will happen during an inspection?

NIEA staff will give you the option to accompany them during their inspection of your land and farm facilities.

They will, in particular, wish to inspect areas of your land which appear to be most vulnerable to pollution. This would, for example, include fields besides waterways, boreholes, wells or springs. They may also wish to see slurry application equipment. Photographs will be taken as a record of the inspection and, in some cases, samples may be taken.

Section 5 - Livestock Manure Nitrogen Loading

5.1 What are the manure nitrogen loading limits?

The amount of total nitrogen in livestock manures applied to the eligible land under your control, including by the animals themselves, must not exceed **170 kg N per ha per year** as required by the Directive. This is known as the "livestock manure nitrogen loading limit".

In Northern Ireland approximately 90% of farms are working under this limit. Only intensive dairy, beef, pig and poultry farms tend to exceed this limit, however, it is strongly advisable that all farm businesses calculate their nitrogen loading.

5.1.1 How do I calculate my farm's livestock manure nitrogen loading?

To calculate the livestock manure nitrogen loading, you should work out the total nitrogen excretions for the livestock on your farm and divide by the eligible agricultural area controlled. The amount of nitrogen excreted annually by various types of livestock is set out in **Annex F**. A ready reckoner table can also be found in **Annex D** which indicates the approximate eligible land area required for some enterprises.

The steps involved are:

- For each stock type calculate the average stock numbers based on a minimum of alternate months of the year.
- Multiply the amount of nitrogen excreted by the stock type by the average stock numbers.
- Total the nitrogen excreted from all the various livestock types.
- Adjust the nitrogen total by adding the nitrogen contained in any imported manures or subtract the nitrogen contained in any exported manures.
- Divide total nitrogen by the eligible agricultural area controlled.

Remember

Nitrogen excretion rates for poultry production systems were revised in 2018, and for some cattle types, revisions were made in 2019. The new figures reflect changes in nutrition, genetics and management of current production systems.

Two examples, for different farm types, of livestock manure nitrogen calculations are set out on the next page.

Example 1: A 46 ha farm with a 50 cow suckler herd and 150 sheep flock

Stock type	**N excretion per animal (kg)**	**Total N excretion (kg)**
50 suckler cows	52	2,600
48 calves under 1 year	19	912
150 ewes	9	1,350
141 lambs up to 6 months	1.2	169
		Total = 5,031
Imported (100 m^3 (22,000 gallons) of 4% DM pig slurry)		+360
Exported manure		-0
		Total = 5,391 kg
Livestock manure nitrogen loading per ha		= 5,391 kg N/46ha
		= 117 kg N/ha (compliant with 170 kg N/ha limit)

Example 2: A 64 ha farm with a 100 cow dairy herd and 132,000 broilers conventional finished per year

Stock type	**N excretion per animal (kg)**	**Total N excretion (kg)**
100 dairy cows	100	10,000
5 cattle over 2 years	45	225
30 cattle 1-2 years	39	1,170
30 calves under 1 year	19	570
132,000 broilers finished per year	40	5,280
		Total = 17,245
Imported manure		+0
Exported (141t poultry litter)		-4,653
		Total = 12,592 kg
Livestock manure N loading per ha		= 12,592 kg N/46ha
		= 197 kg N/ha* (not compliant with170 kg N/ha limit)

*The nitrogen loading is over 170 kg N per ha per year, see **Section 5.1.3** on options to resolve this.

5.1.2 What area of land do I use to calculate this limit?

The area of land used for the calculation of your livestock manure nitrogen loading is called the eligible agricultural area. It is important that you are able to demonstrate control over the area of land used in your calculation. Please refer to **Section 1.3** for additional detail.

To be included, the land must be suitable for agricultural activities, including any common land used for grazing, and excluding areas under farm roads, paths, buildings, woodland, dense scrub, rivers, streams, ponds, lakes, sandpits, quarries, areas of peat cutting, bare rock, areas of forestry, and areas fenced off or inaccessible other than forests which are farmed as part of the agricultural business. Land used for short rotation coppice or orchards can be included. Written documentation confirming grazing rights to common land and the area will be required if common land is to be used.

Remember

It is the total eligible agricultural area used to activate entitlements that will be used to calculate the nitrogen loading for your farm.

5.1.3 What should I do if my farm's livestock manure nitrogen loading is above 170 kg N per ha per year?

If your nitrogen loading is above 170 kg N per ha per year as in **Example 2** before, your options are to:

- apply for a Nutrients Action Programme (NAP) Derogation to operate above the limit; or
- reduce your loading by taking more eligible land, exporting livestock manure and/or reducing livestock numbers.

5.1.4 What is a NAP Derogation?

You can farm above 170 kg N per ha per year up to a limit of 250 kg N per ha per year from grazing livestock manure, provided your farm meets certain key criteria. This is referred to as a derogation. Application for derogation must be made to NIEA on or before 1 March each year.

Farms operating under derogation must adopt additional nutrient management, land spreading restrictions and record-keeping measures to ensure that operating at a higher grazing livestock manure limit does not adversely impact on water quality.

All NAP Derogation applicants **MUST**:

- Complete an online application by midnight of the 1 March each year.
- Maintain 80% or more of their agricultural area available for manure application in grassland.
- Maintain a holding with grazing livestock i.e. Cattle, Sheep, Deer, Goats and Horses.
- Ensure that the nitrogen loading does not exceed 250 kg nitrogen per hectare on your land from the grazing animals themselves.
- Prepare a Fertilisation Plan by 1 March each year and retain on farm. The plan should be kept updated.
- Prepare & retain a Fertilisation Account which must be submitted to the Department online by the 1 March of the following calendar year.
- Ensure the total nitrogen inputs shall neither exceed the nutrient demand of the crop nor the maximum fertilisation rate applicable to the grassland holding.
- Carry out a soil test at least every four years for each homogenous area of grassland with regard to crop rotation and soil characteristics. At least one soil analysis per four hectares shall be carried out.
- Ensure livestock manure is not spread in the Autumn (September, October and November) before grass cultivation (ploughing & reseeding).
- Ensure that the phosphorus balance does not exceed a surplus of 10 kg phosphorus per hectare per year.
- Apply at least 50% of slurry produced on the holding on or before the 15 June of each year.
- Low emission slurry spreading equipment shall be used for any slurry applications after 15 June each year.
- Ensure temporary grassland is ploughed in Spring (March, April & May).
- Ensure ploughed grass is followed immediately by a high nitrogen demand crop.
- Ensure crop rotation shall not include leguminous or other atmospheric nitrogen fixing plants. However crop rotations may include clover in grassland with less than 50% clover and other leguminous plants that are undersown with grass.

If the conditions of derogation are not met you will not be eligible for a derogation the following year.

More information about the NAP Derogation can be found at www.daera-ni.gov.uk/articles/nitrates-directive or in the NAP Derogation Guidance Booklet which is available on-line at www.daera-ni.gov.uk/articles/nitrates-directive (see **Annex V** for further contact details). To apply for a derogation go to www.daera-ni.gov.uk/onlineservices

5.1.5 What if I am importing or exporting manure?

If you are exporting livestock manure, either within Northern Ireland or elsewhere, you can subtract the amount of total nitrogen exported from the livestock manure nitrogen loading calculation for your farm. Similarly, if you are importing livestock manures, you must add the amount of total nitrogen imported to the calculation. **Annex E** shows some examples of calculations of the amount of livestock manure that could be imported or exported to meet the 170 kg N per ha per year limit.

Organic manure export records

Records of exports of all organic manures must be submitted to NIEA annually using DAERA online services at www.daera-ni.gov.uk/onlineservices by 31 January for non-derogated farms for the previous calendar year. If you do not submit your records on time, the information cannot be taken into account for calculating nitrogen loading on your farm.

See **Annex N** for a sample record sheet to be kept on farm.

See **Annex P** for information on exporting manure to ROI.

5.1.6 Can I deviate from the standard nitrogen excretion values and nutrient content values for livestock manures?

Yes. You may wish to use different values from the standard values for livestock nitrogen excretion and manure nutrient contents; for example, because you keep rare breeds.

If so, you must obtain prior approval from NIEA based on a scientific case. Contact NIEA for detail on procedures. Contact details may be found in **Annex V**.

5.1.7 Does the application of anaerobic digestate count towards my nitrogen loading?

In order to simplify regulation for the NAP, if you are using any digestate that contains livestock manure, NIEA will treat the whole volume of digestate as livestock manure. **This means the nitrogen loading kg N per m^3 from the digestate will count as part of the 170 kg N per ha livestock manure loading limit** (or, on derogated farms, 250 kg per ha if the digestate is from grazing livestock manure). If you do not wish this to happen, for example, because this would put your farm above the nitrogen loading limit, you can provide evidence to NIEA of the proportion of feedstock that is livestock manure and the proportion that is other types of organic material. NIEA will then treat this proportion of the digestate as 'other organic manure' which can be applied to crop nitrogen requirement (see **Section 6.1** for more information).

5.1.8 Where can I get more help to calculate the livestock manure nitrogen loading for my farm?

A worksheet to help you calculate the livestock manure nitrogen loading limit can be found in the NAP 2019-2022 Workbook which is available on-line at: www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022 Alternatively, you can access the 'Nitrogen Loading Calculator' at www.daera-ni.gov.uk/onlineservices.

Livestock manure nitrogen loading - what will happen during an inspection?

NIEA will use your records of eligible land, stock numbers and exported/imported livestock manure to calculate the livestock manure nitrogen loading for your farm. Where relevant, they may also use Animal and Public Health Information System (APHIS) records. Your records need to be adequate for the inspector to assess your compliance with the nitrogen loading limit (see Section 10 for more detail on record keeping).

You are not required to have made the calculation before any inspection, but doing so will help you check that you are not in breach of the Regulations.

Section 6 - Overall Nitrogen Fertiliser Limits

6.1 What limits are there on the land application of nitrogen fertiliser for grassland?

Chemical fertiliser and organic manures cannot be applied above the grassland requirement for nitrogen.

Very few grassland farms in Northern Ireland will be affected by the maximum chemical nitrogen application limits.

It is recommended that on moderately or lowly stocked farms, lower nitrogen rates should be used. Certain grassland habitat areas may have significantly lower limits or fertilisation may be prohibited if a designated site or under an agri-environment scheme.

6.1.1 Nitrogen limits for grassland area

The maximum amounts of *available nitrogen* from chemical fertiliser and organic manures (other than livestock manures) that can be applied on the grassland area of your farm are set out in **Table 4**. The nitrogen limits are the maximum nitrogen application rates for the whole area of grassland, and not individual fields. There is no specific nitrogen limit for silage, grazing or reseeding areas. The limit depends on the type of livestock on the farm.

When calculating the livestock manure nitrogen loading **(Section 5.1.1)**, if more than 50% of the annual total nitrogen in livestock manures comes from dairy cows and dairy heifer replacements, use the 'dairy farm' nitrogen limit.

All other livestock farms must use the 'other livestock farm' nitrogen limit.

Table 4 - Nitrogen application limits for chemical fertiliser and organic manure (other than livestock manure) per year over whole grassland area

	Maximum kg N per ha
Dairy farms	272 ($8^{1}/_{4}$ bags per acre)*
Other livestock farms	222 ($6^{3}/_{4}$ bags per acre)*

* Approximate number of 50 kg bags of a 27% N type product.

Example:

A 46 ha farm with a suckler herd and sheep flock applies 30 tonnes of a 27% N type fertiliser on 40 ha of grassland. This would equate to 202 kg N per ha (30,000 t x 27%)/40 ha).

The nitrogen fertiliser limits for grassland in **Table 4** already take into consideration the application of available nitrogen from livestock manures, regardless of type. Therefore, nitrogen from livestock manures applied to grassland should not be subtracted from the grassland limits. However, if other organic manures, other than livestock manures (for example, sewage sludge and anaerobic digestate) are applied, the available nitrogen from this manure **must be** subtracted.

Using organic manures apart from livestock manure

Organic manures such as sewage sludge, abattoir waste, fish farm residues and some anaerobic digestates (see **Section 1.5** for more information on when anaerobic digestate might be considered as livestock manure) can be applied as fertiliser to grassland and other crops.

You should also be aware that waste materials e.g. waste digestate (**Annex T**), waste sludge's etc. which fall within the definition of organic manure, also fall within the scope of waste legislation when applied to land for agricultural benefit. Please note that this is outside of the scope of exemptions under the Agricultural Waste Regulations. Instead, in such cases, an exemption from waste management licensing is required from NIEA. Contact details may be found in **Annex V**. Application of sewage sludge to agricultural land does not fall under waste legislation but, is regulated by the Sludge (Use in Agriculture) Regulations (Northern Ireland) 1990.

The application of such manures is restricted to the grass/crop requirement for both nitrogen and phosphate, and you must provide evidence of the nitrogen and phosphate content of the manure. In the case of these organic manures the percentage nitrogen availability stated in **Annex G**, must be used to calculate the amount of available nitrogen applied.

An exemption from waste management licensing is required for the storage of sewage sludge and waste materials/sludges (farm residues).

6.1.2 Where can I get more help to calculate nitrogen fertiliser limits for grassland?

You will find worksheets to help you check compliance in the NAP 2019-2022 Workbook, which is available on-line www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022.

Nitrogen limits are calculated by dividing the amount of available nitrogen applied to grassland by the area of grassland. You can also use the 'N-Max for Grassland Calculator' at www.daera-ni.gov.uk/onlineservices to calculate your farms use of nitrogen on grassland.

6.2 What limits are there on the land application of nitrogen fertiliser for other crops?

For arable, forage and horticultural crops the maximum amount of available nitrogen in fertilisers (including organic manures) that can be applied per hectare must be in accordance with crop nitrogen requirement.

The crop nitrogen requirement is partly related to the available nitrogen in the soil which is influenced by the previous crop, its management, the amount of rainfall and soil type. The level of residual nitrogen within the soil and available for the next crop is called the Soil Nitrogen Supply (SNS) and is expressed as an index.

Using the appropriate SNS index for crop areas with the same cropping history and soil type, the crop nitrogen requirement for most crops other than grass can be calculated using the latest edition of the AHDB Nutrient Management Guide (RB 209). The amount of available nitrogen applied to the crop must not exceed the crop nitrogen requirement.

In situations where the soil type is uncertain, the guidance found in **Annex H** may be used to assess the maximum crop nitrogen requirement. This guidance has been derived from the latest edition of the AHDB Nutrient Management Guide (RB 209) and takes into account the most common soil types in Northern Ireland.

For a number of cereal crops - **winter and spring crops of wheat, barley and oats** - an *N-max system* has been introduced from 2015 for high yielding situations and is explained in **Sections 6.2.1-6.2.2**.

Remember!

If organic manures, including livestock manures, are to be applied to the crop area, the nitrogen available from these manures (**Annex G**) must be subtracted from the maximum nitrogen application rate of chemical fertiliser.

6.2.1 What is the N-max system for high yielding cereal crops?

For a number of cereal crops (referred to as N-max crops):

- winter and spring wheat;
- winter and spring barley; and
- winter and spring oats

an N-max system has been introduced from 2015 to help specialist growers achieve yield potential without adversely affecting the environment. This means that the maximum nitrogen application (N-max) limits for these cereals are no longer the recommendations in the AHDB Nutrient Management Guide (RB209), but are based on a single N-max value

for each cereal type. The N-max values take account of soil type, SNS index and the standard yield expected for each cereal type in Northern Ireland growing conditions. The N-max values and guidance on how to use them are set out in **Annex I**.

The N-max system should be helpful on those farms with a history of high yielding crops, such as specialist arable growers. Otherwise, the recommended nitrogen application rates set out in **Annex H** (and derived from the AHDB Nutrient Management Guide (RB209) should continue to be followed for these cereals.

6.2.2 What if my average yields are different from the standard yields in the N-max table?

a. If your average yields are higher

For any N-max crop, you can increase the permitted maximum nitrogen application by 20 kg N per ha for every tonne that your expected yield exceeds the standard yield set out in the N-max table (**Annex I**). To do this you must have evidence that your overall farm crop yield for the cereal has exceeded the standard yield in any of the previous three years. You should retain the records showing this, in case of inspection.

b. If your average yields are lower

If you know that your average yield for any particular N-max crop is lower than the standard yield set out in the N-max table, the recommended nitrogen application rates set out in **Annex H** should continue to be followed. For best agronomic practice, the more detailed guidance set out in the AHDB Nutrient Management Guide (RB 209) can be consulted.

6.2.3 Where can I get more help to calculate nitrogen fertiliser limits for crops other than grass?

Worksheets to help you calculate the amount of nitrogen to be applied to crops other than grass (including N-max for high yielding cereals) can be found in the NAP 2019-2022 Workbook which is available on-line at: www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022

Alternatively you can use the 'Crop Nutrient Calculator' at www.daera-ni.gov.uk/onlineservices to calculate nitrogen and phosphate requirements for your crops.

Nitrogen fertiliser limits - what will happen during an inspection?

NIEA will use your records of land areas of crops grown and amount and types of fertilisers applied to check whether you have complied with the nitrogen application limits for different crops. Your records need to be adequate for the inspector to assess your compliance with the application limits (see **Section 10** for more detail on record keeping).

You are not required to have made any calculations before an inspection, but doing so will help you check that you are not in breach of the Regulations.

Section 7 - Restrictions on Phosphate Application

7.1 Do I have to check crop requirement for phosphate before I apply fertiliser?

In order to meet the requirements of the NAP Regulations and other environmental legislation, you will need to check whether there is a crop requirement for phosphate before you apply certain types of fertiliser. These are:

- chemical phosphate (P_2O_5) fertiliser;
- from 2017, *P-rich manures* as defined in **Section 7.7**, and
- from 2020, anaerobic digestate (except where all feedstock is produced on the holding where the digestate is to be applied)
- sewage sludge[1];
- organic manures applied to land under a Waste Management licence or exemption (e.g. abattoir waste and some anaerobic digestate)[2]

It is a legal requirement not to apply these types of fertilisers to either grass or other crops unless there is a crop requirement for phosphate, taking account of the soil fertility status (as indicated by the soil *phosphorus (P) index*) and the supply of phosphate from the application of other fertilisers. **From 1 January 2020 this is a cross-compliance requirement.** Soil P index can only be established through a soil test. The application of these fertilisers is limited to the individual fields or area sampled.

7.2 When is a soil analysis required?

From 1 January 2020 you will require a soil analysis before applying *chemical phosphate fertiliser,* high P manures and anaerobic digestate.

7.3 Do I have to prepare a fertilisation plan?

From the 1 January 2020 it is a requirement for all farms applying chemical phosphate fertiliser to grassland, high phosphorus (P) manures or anaerobic digestate to any land to prepare a fertilisation plan.

The aim of a fertilisation plan is to encourage a planned approach to nutrient application and to reduce the application of P fertiliser where it is not required, resulting in more efficient use of phosphate and potential savings in fertiliser costs whilst protecting the environment.

The key steps in fertilisation planning include:

- Establish the soil nutrient status, using a current soil analysis
- Identify the nutrient requirement or crop need, for grassland use the NAP Regulations (refer to **Annex J**) and for all other crops use the AHDB Nutrient Management Guide (RB209) (refer to **Annex H)**.

1 The Sludge (Use in Agriculture) Regulations (Northern Ireland) 1990 apply.
2 The Waste Management Licensing Regulations (Northern Ireland) 2003 apply.

- Calculate the quantity of organic manure to be applied according to the nutrient content for each manure type.
- Select the type and quantity of chemical fertiliser to make up the balance.

A fertilisation plan must be prepared each year and must be kept up to date throughout the year if there are any changes. Guidance on how to complete a fertilisation plan for a non-derogated farm is provided in **Section 10.3**.

Derogated farms must complete a NAP Derogation Fertilisation Plan by 1 March each year. More information about NAP Derogation 2019-2022 can be found at www.daera-ni.gov.uk/articles/nitrates-directive.

Remember!
Take soil analysis and prepare a fertilisation plan prior to applying any Chemical P fertiliser to grassland, high-P manure or anaerobic digestate to any land.

7.4 How should a soil sample be taken?

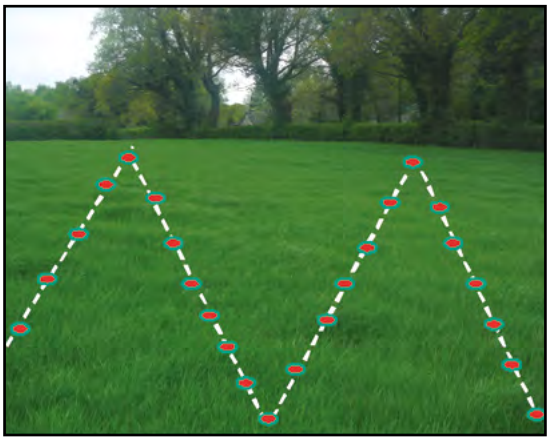
Samples can be taken by farmers. The following procedures must be followed:

Area to sample: The size of the area from which one sample can be taken must not be more than 4 ha. Generally one bulked sample shall be collected from each field. Within one field, areas which are not uniform for crop growth and areas which have been cropped or fertilised differently must be sampled separately.

Time of sampling: Sampling every fourth year is satisfactory as a basis for phosphate fertiliser recommendations. A field must not be sampled until at least three months after the last application of any fertiliser (organic or chemical).

Depth of sampling: Grassland must be sampled to a depth of 75 mm and arable land to a depth of 150 mm.

Method of sampling: A soil sample must be made up by bulking at least 25 sub-samples taken from the area to be sampled. The sub-sampling points must be selected systematically to give an even distribution over the whole sampling area. This distribution shall be achieved by following the pattern of a letter ‘W’ and taking sub-samples at regularly spaced intervals. Taking sub-samples from headlands, dung and urine patches, areas where stock gather or other unusual features must be avoided.



Each sub-sample must be taken using a soil auger which takes an even core of soil throughout the sampling depth. The soil sample must be stored in a clean, labelled plastic bag. Your local DAERA office can supply the equipment needed.

Testing the sample: Analysis must be carried out by a laboratory competent in soil phosphorus analysis. Each analysis, provided by the competent laboratory, will require a United Kingdom Accreditation Service (UKAS) accreditation or National equivalent statement.

7.5 How do I determine a requirement for phosphate?

The soil test establishes the P index of the soil. For easy reference, using this index, crop requirement for phosphate for some common crops in Northern Ireland can be found in **Annex J**. It can also be established from tables set out:

- For grass - in the NAP Regulations.
- For other crops - in the AHDB Nutrient Management Guide (RB 209).

Remember!

For Northern Ireland - the phosphate recommendations for grassland in the AHDB Nutrient Management Guide (RB 209) are no longer current. The recommendations set out in the NAP Regulations and **Annex J** should be used instead.

7.6 How do I account for the supply of phosphate in organic manures?

The supply of phosphate from organic manures, including livestock manure, need only be accounted for if any of the fertilisers listed in **Section 7.1** are to be applied.

The set availability values of phosphate in manures depend on the soil P index and the type of crop grown. The phosphate content and availability values of different manures and fertilisers are set out in the NAP Regulations and provided in **Annex G**.

Remember!

Even when a soil test is not a mandatory requirement, regular soil testing and nutrient management planning is still recommended. This will help you manage manure and fertiliser applications to optimise grass and crop growth, improve/maintain soil fertility, reduce fertiliser costs and help protect water quality.

7.7 What are P-rich manures?

Organic manures which contain more than 0.25 kg of total P per 1 kg of total N are considered to be P (phosphorus)-rich manures for the purposes of the NAP. The proportion of phosphorus to nitrogen of a number of common organic manures is set out in **Annex G**. Currently the values for a number of poultry manures - including layer, broiler breeder, free range layer and pullet manure - fall into this category.

When manures contain a high proportion of phosphorus compared to nitrogen, there is a risk of over application of phosphorus when nitrogen is applied in line with crop requirement.

7.7.1 What if I'm only applying a very small amount of this type of manure?

Many farm businesses will not be applying any manures containing a high enough proportion of phosphorus to be affected by this measure. For some other farm businesses the nutrient loading from P-rich manures will come from a minor farm enterprise and only contribute a small proportion of overall nutrient loading on the farm. Examples of this would be farms which keep a small number of horses or which breed hobby poultry. The requirements at **Section 7.1**, therefore, exclude enterprises producing P-rich manures where the *total* nitrogen loading from the manure is less or equal to 7 kg N per ha (this equates to approximately five adult horses on an average-sized (40 ha) farm).

7.8 What if I am applying anaerobic digestate?

If you are producing digestate as part of your business, you must have the digestate analysed. Digestate should be analysed regularly and any time the digester feedstock type and amounts are altered. If you are importing digestate, you must obtain a nutrient analysis from the producer.

The nutrient analysis must contain the following:

- percentage dry matter;
- total N (nitrogen);
- total P_2O_5 (phosphate);
- total K_2O (potash); and
- ammonia N or NH4+.

Anaerobic digestate must not be applied unless there is a crop requirement for phosphate, taking account of the soil fertility status (as indicated by a soil phosphorus (P index), **except where all of the digestate is produced from livestock manure or non-waste feedstock generated on the holding where it is to be applied.** A fertilisation plan must be prepared each year prior to any anaerobic digestate being applied and the plan must be kept up to date. Guidance on how to complete a fertilisation plan for a non-derogated farm is provided in **Section 10.3**.

Remember!

If you are importing anaerobic digestate you must; keep a record of the nutrient analysis provided by the producer, have a soil analysis to demonstrate crop phosphorus requirement and prepare and maintain a fertilisation plan each year.

7.9 Are there different phosphate recommendations for extensively managed grassland?

Yes. Grassland (i.e. grazing, silage, hay & reseeds) that is extensively managed has a lower nitrogen & phosphate requirement. Grassland managed 'extensively' with relatively low nitrogen inputs, should have lower phosphate requirements and a lower target soil P level than grassland managed 'intensively' with high nitrogen inputs driving high levels of grass production and phosphate removal.

Therefore, for grassland managed extensively and receiving low inputs of nitrogen as chemical N typically supporting grazing and one cut of silage or hay per season the target soil P Index is 2- (16-20 mg/l). Crop requirement for phosphate for extensively managed grassland in Northern Ireland can be found in **Annex J**.

Research

On-farm research by AFBI has provided evidence that grass Dry Matter (DM) production on extensively managed land is limited by nitrogen deficiency rather than inadequate phosphate availability. Accordingly, there is no justification for applying rates of phosphate needed to support DM production at 9-12 t DM/ha/year and maintain soil P at Index 2+, when such levels of production cannot be achieved with the nitrogen inputs typical of extensively managed grassland systems in Northern Ireland (< 60 kg N/ha/year). Furthermore, there is clear evidence that over-use of phosphate fertiliser on many extensive cattle and sheep farms, even within LFA's, is raising soil P to unacceptably high levels (Index 3 - 5) and exacerbating water quality problems.

7.9.1 How do I determine if my grassland is extensively managed?

Grassland receiving on average less than 60 kg N per ha per year as chemical nitrogen fertiliser applied to the entire grassland area or with a manure N loading of less than **120 kg N per ha per year** is defined as extensively managed grassland. Use the N-Max for Grassland to determine the amount of nitrogen applied per ha per year and the N Loading Calculator to calculate your N Loading available at www.daera-ni.gov.uk/onlineservices.

Example:

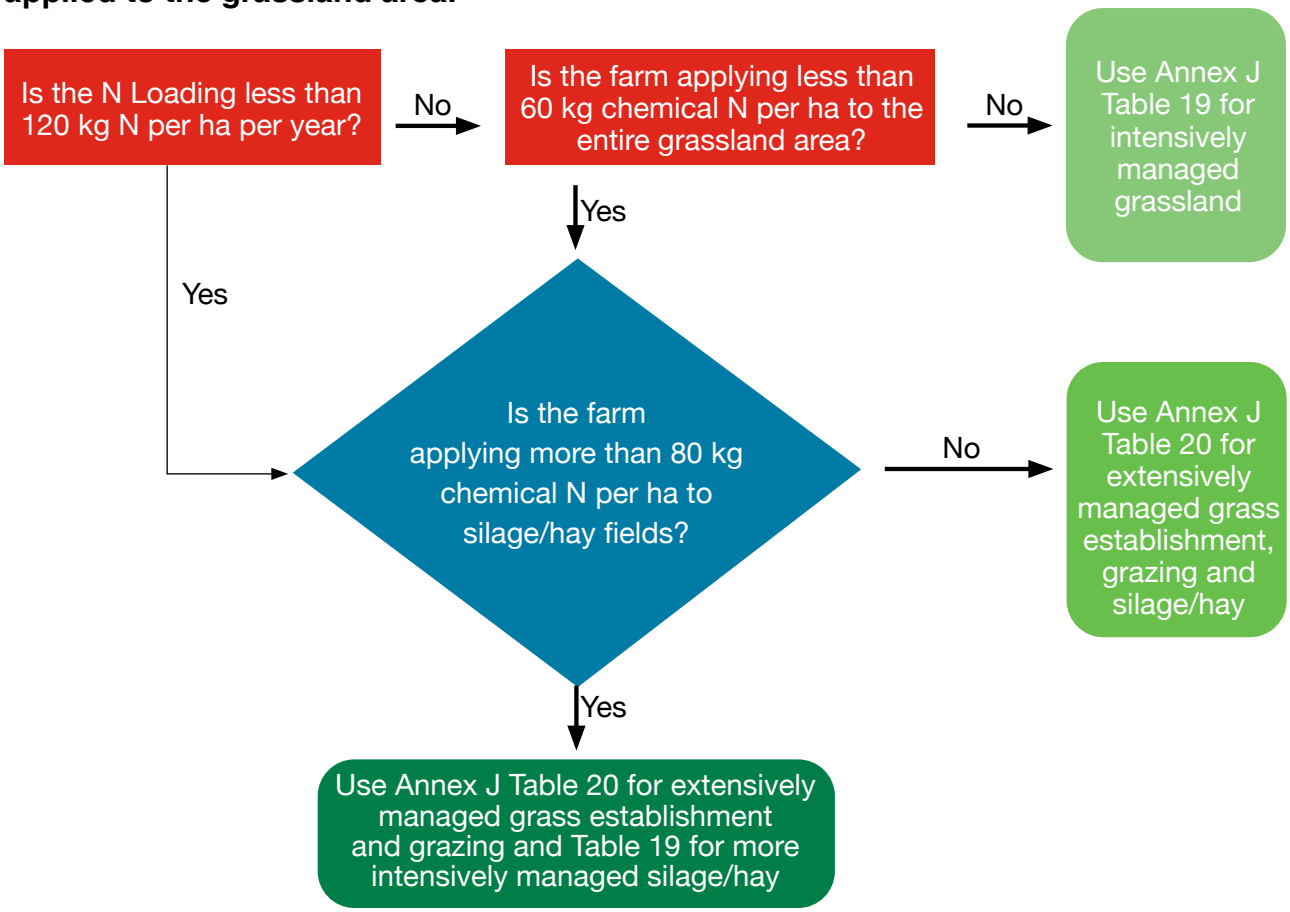
A 46 ha farm with a suckler herd and sheep flock applies 7.5 tonnes of a 27% N type fertiliser on 40 ha of grassland. This would equate to 51 kg N per ha (7500 kg x 27%)/40 ha) or 1.5 bags per acre*.

*Approximate number of 50 kg bags of a 27% N type product.

7.9.2 Can I apply higher rates of phosphate to my silage/hay if my grassland is extensively managed?

Yes. In situations where grassland is managed extensively, i.e. with on average less than 60 kg N per ha per year as chemical fertiliser applied to the entire grassland area, but where more than **80 kg N per ha per year** chemical nitrogen fertiliser is applied to certain fields for 1st cut silage or hay, higher rates of phosphate fertiliser are permissible on these fields - as shown in **Annex J**.

Figure 4: Extensively managed grassland where the N Loading is less than 120 kg N per ha per year or less than 60 kg N per ha per year of chemical nitrogen fertiliser is applied to the grassland area.



Example: A farm with a total grassland area of 30ha and with an N Loading of 98 kg N per ha per year. The silage area of 8 ha receives 3 tonnes of 24.6.12 type fertiliser (3 bags per acre)*, the hay area of 2 ha receives 0.75 tonnes of 24.6.12 type fertiliser (3 bags per acre)* and grazing area of 20ha receives 2.5 tonnes of 27%N type fertiliser (1 bag per acre)*.

***Approximate number of 50 kg bags of chemical fertiliser.**

Grass crop	Chemical N Fertiliser quantity & type	Total Chemical N applied per ha	Which P recommendation do I use?
Silage/hay 10ha	3.75t 24.6.12	**90 kg N per ha** (3750 kg x 24%)/10ha	More than 80 kg chemical N per ha; use **Table 19** for silage & hay **Annex J**
Grazing 20ha	2.5t 27%N	34 kg N per ha (2500kg x 27%)/20ha	
Total grassland 30ha		**52.5 kg N per ha** ((2500kg x 27%)+(3750 kg x 24%))/30ha	Less than 60 kg chemical N per ha; use **Table 20** for grass establishment and grazing **Annex J**

7.10 Where can I get more help to determine if my grassland is extensively managed?

You can use the N Loading Calculator to check if your N Loading is below 120 kg N per ha year. Use the N-Max for Grassland Calculator to determine if you are applying less than 60 kg chemical N per ha to your grassland and more than 80 kg chemical N per ha to your hay/silage area. Both these calculators are available at www.daera-ni.gov.uk/onlineservices.

7.11 Where can I get more help on complying with phosphate limits?

Worksheets to help you calculate the amount of phosphate required by crops can be found in the Nutrients Action Programme 2019-2022 Workbook which is available on-line at: www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022

Alternatively you can use the 'Crop Nutrient Calculator' at www.daera-ni.gov.uk/onlineservices to calculate nitrogen and phosphate requirements for your crop.

Phosphate application - what will happen during an inspection?

NIEA will use your records of soil tests, land areas of crops grown and amount and types of fertilisers applied to check whether you have complied with the phosphate application limits for different crops. Your records need to be adequate for the inspector to assess your compliance with the application limits (see **Section 10** for more detail on record keeping).

You are not required to have made any calculations before an inspection, but doing so will help you check that you are not in breach of the Regulations

A fertilisation plan will be required to demonstrate that your planned fertiliser application does not exceed crop phosphorus requirements if you are applying chemical phosphate fertiliser to grassland, or high P manures or anaerobic digestate to any land.

Section 8 - Livestock Manure, Silage and Silage Effluent Storage Requirements

8.1 Storage capacity for livestock manure

8.1.1 How much livestock manure storage do I need on my farm?

You must provide adequate storage to cover the closed spreading periods set out in **Section 3**. You must also ensure that your storage is adequate to cover periods of adverse weather and soil conditions outside of the closed spreading period, as set out in **Section 4.1.2**.

The minimum storage requirement is 22 weeks for livestock other than pigs and poultry **(Section 8.1.2).**

When calculating your storage capacity, remember to account for:

- Slurry produced by livestock.
- Rain on yards where slurry is produced and rain entering open tanks.
- Dirty water collected with slurry.
- Dairy washings collected with slurry.
- Silage effluent.
- Roof water falling onto dirty yards.
- Separated solids from cattle and sheep slurry.
- Slurry exported to processing.

Sections 8.1.5 - 8.1.11 provide details about deductions and allowances relating to the calculation of the storage requirement.

8.1.2 What storage capacity must a pig and/or poultry farm provide?

A farm with more than 10 breeding sow places or 150 finishing pig places, or a farm with more than 500 poultry places must provide a minimum of 26 weeks storage capacity. Where a farm has a pig enterprise with less than 10 breeding sow places, or less than 150 finishing pig places or where a poultry enterprise has less than 500 poultry places, a minimum of 22 weeks storage is required.

8.1.3 What storage capacity must a mixed livestock farm provide?

Where a farm has a pig and/or poultry enterprise and another livestock enterprise it must have 26 weeks storage for the pig and/or poultry enterprise and 22 weeks storage for the other livestock enterprises, for example dairying or beef, on the farm.

8.1.4 How do I calculate my livestock manure storage capacity?

A worksheet to help you calculate the livestock manure storage capacity on your farm can be found in the NAP 2019 -2022 Regulations Workbook which is available on-line at: www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022

Alternatively, you can access the ‘Manure Storage Calculator’ at: www.daera-ni.gov.uk/onlineservices

8.1.5 Can I include rented manure storage facilities?

Yes. Additional tanks can be rented to assist in meeting the storage requirements, provided the following conditions are met:

- a rental agreement containing details of the rented facilities is held on record (see **Annex L**); and
- the storage facility is maintained and managed in accordance with NAP Regulations (**Section 8.2.1**).

If the rented storage facility is no longer available, it is the responsibility of the farmer to meet the minimum storage requirements. The owner of the storage facility should be aware of the increased bio-security risks to any stock on his premises. If there is an outbreak of a notifiable disease on the farm of origin of the slurry, or on the farm receiving the slurry, there may be consequences for each herd owner. This may include restrictions and testing.

8.1.6 Can I exclude manure produced from animals on bedded accommodation?

The quantity of slurry produced from animals housed in bedded accommodation and collected as farmyard manure, for the 22-week period between 1 January to 28 February and 1 October to 31 December does not need to be taken into account when calculating your farm's slurry storage capacity. You can make use of this allowance, provided that:

- the bedded accommodation has the appropriate area for the number of stock accommodated as detailed in **Annex K**;
- the bedded accommodation has adequate effluent collection and containment facilities to prevent water pollution;
- where the farmyard manure is stored in a midden, there must be adequate effluent collection, and storage facilities for the duration of the closed period; and
- where bedded animals have access to a solid or slatted area where slurry is collected, only 50% of the slurry/manure produced by those animals can be allocated to farmyard manure.

For example, where 40 animals are housed on straw bedding but have access to a solid or slatted area for feeding, slurry storage will be required for the equivalent of 20 animals while the total manure produced from 20 animals can be regarded as farmyard manure production.

8.1.7 Can I exclude separated slurry?

Yes. For all livestock slurries, except pig slurry, removing the solids from slurry reduces the volume and the storage requirement. The maximum volume reduction allowed is 20%. The separated liquid cannot be spread during the closed spreading period for slurry and the solid fraction cannot be applied during the closed spreading period for farmyard manure. The solid fraction in the case of cattle slurry may be stored as described in **Section 8.3**.

8.1.8 Can I exclude poultry litter stored in a midden or field heap?

Yes. The quantity of any poultry litter produced which is stored in a midden or field heap (as described in **Section 8.3**) does not need to be taken into account when calculating your farm's slurry storage capacity provided there are adequate effluent collection and storage facilities for the duration of the closed period.

8.1.9 Can I exclude livestock manure that is exported to be processed, treated or recovered?

Yes. Excluding separation, as per **Section 8.1.7**, livestock manure exported for treatments such as composting, pelletising, fertiliser production, AD, gasification and incineration can be excluded. A valid contract with a manure processing facility or evidence of access to an approved treatment or recovery outlet must be held on record. An example is found in **Annex M**.

All records of manure exports must also be submitted online annually using DAERA online services at www.daera-ni.gov.uk/onlineservices by 31 January. A record of imports/ exports should be retained on farm an example of such a record is included at **Annex N**

8.1.10 Can I exclude manure produced from out-wintered livestock?

Yes, as long as the type of livestock out-wintered, the annual stocking rate and the stocking rate on the out-wintered area meet the conditions shown in **Figures 5 and 6**.

The out-wintering period is the 22 weeks period of 1 January to 28 February and 1 October to 31 December.

Manure from dairy cows cannot be excluded from the livestock manure storage capacity calculation.

The stocking rate is expressed as a livestock manure nitrogen loading per ha. The stocking rate on the out-wintered area is calculated using the annual amount of nitrogen excreted divided by the area of grassland used for out-wintering. Three factors must be taken into account:

1. The type of livestock being out-wintered.
2. Annual livestock manure nitrogen loading.
3. Livestock manure nitrogen loading during the out-wintering period.

Figures 5 and 6 show how to decide whether manure from out-wintered stock can be excluded from your manure storage calculation.

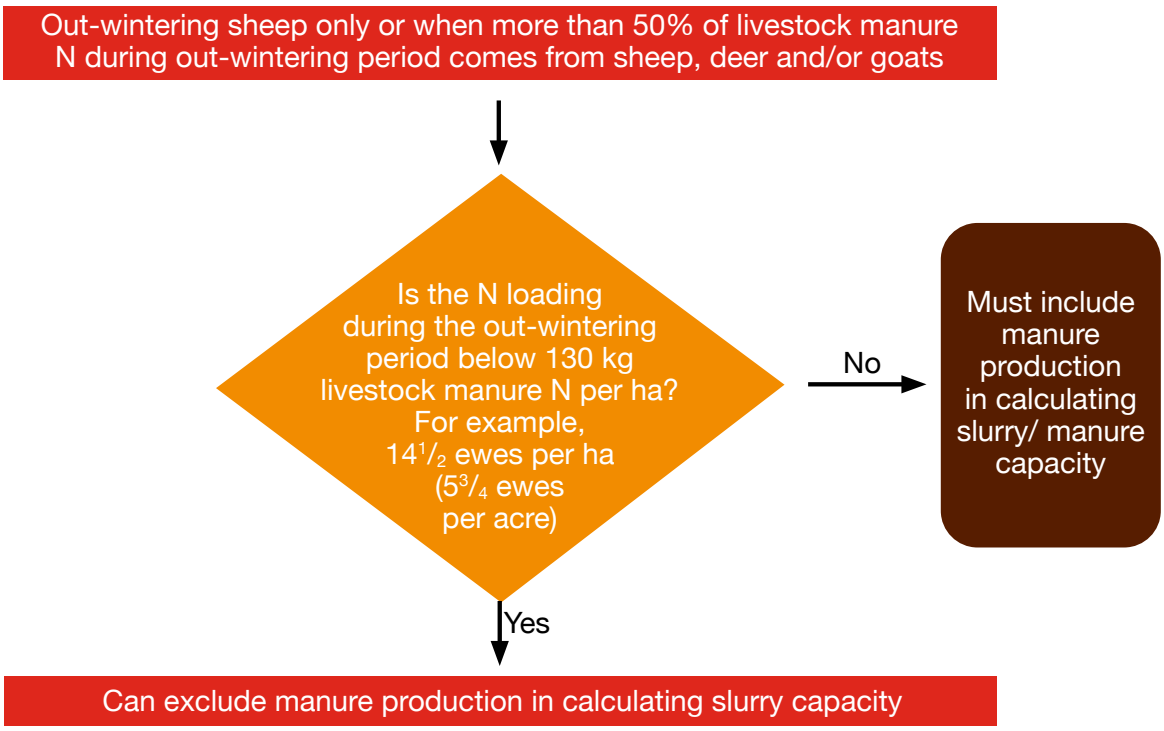
8.1.11 Are there any restrictions on a farm out-wintering within the 130 kg and 85 kg grassland nitrogen loading limits?

Yes. For the manure to be excluded the livestock must be out-wintered on grassland and you must ensure that they have free access at all times to the required land area. Areas can be block grazed for management reasons but all of the required land area must be grazed during the out-wintering period. Manure produced on an area less than the required area or on stand-off pads/corrals cannot be excluded when calculating storage capacity.

The land must also be maintained in good agricultural and environmental condition (see DAERA Cross-Compliance Verifiable Standards Booklets) and the reduction in storage must be proportionate to the number of out-wintered livestock on the holding. The land used for the purposes of out-wintering must be under the control of the holding to which the exemptions are to apply.

Copies of the DAERA Cross-Compliance Verifiable Standards Booklet can be obtained in www.daera-ni.gov.uk/articles/cross-compliance

Figure 5: Excluding manure from out-wintered livestock (apart from dairy cows) from storage calculation where more than 50% of livestock manure nitrogen produced during the out-wintered period comes from sheep, deer and/or goats.



Example (a)(1): Out-wintering 150 ewes on 40 ha of grassland (sheep only)

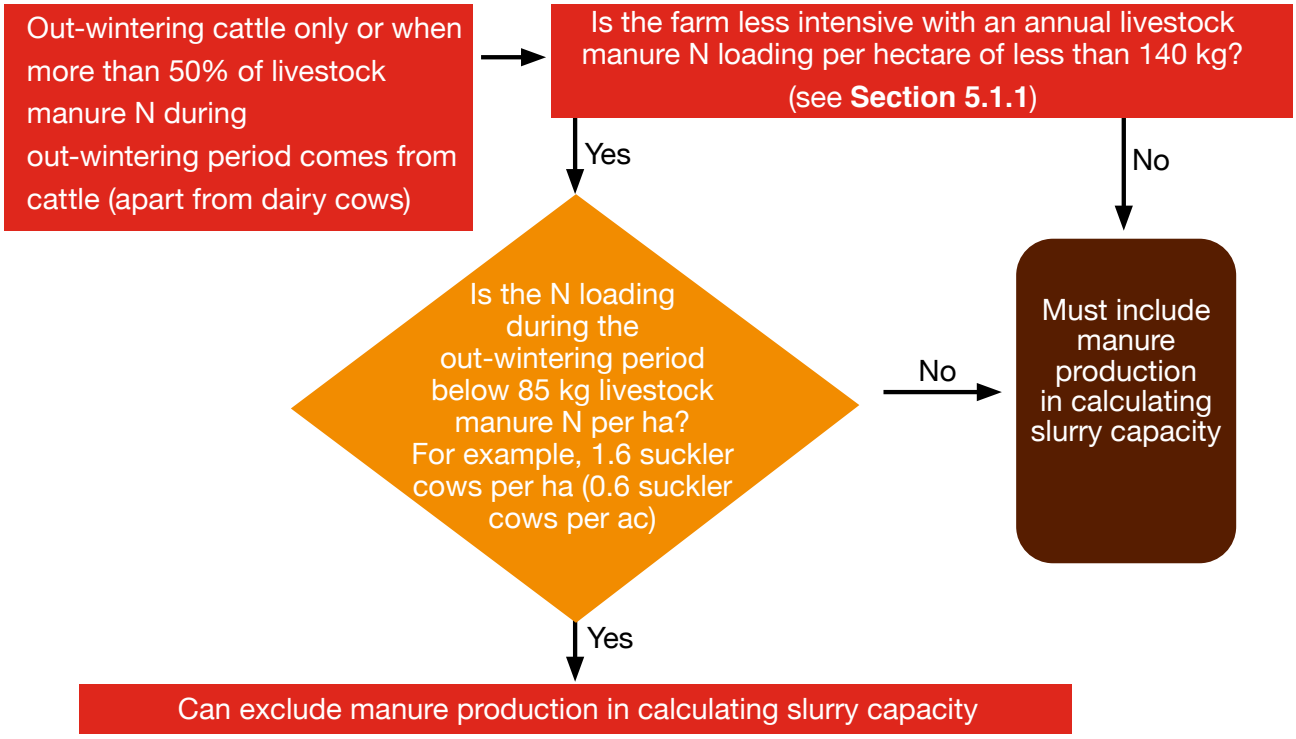
Stock type	Number	N excretion rate	Total N excretion
Suckler cow	0		
Cattle under 1 year	0		
Ewes	150	9	1,350
Lambs under 1 year	0		
Total			**1,350**
N loading per ha during out-wintering period			**= 1,350 kg N per 40ha = 34 kg N per ha**

Example (a)(2): Out-wintering 10 suckler cows and 150 ewes on 40 ha of grassland (more than 50% of N from sheep, deer or goats)

Stock type	Number	N excretion rate	Total N excretion
Suckler cow	10	54	540
Cattle under 1 year	0		
Ewes	150	9	1,350*
Lambs under 1 year	0		
Total			1,890
N loading per ha during out-wintering period			**= 1,890 kg N per 40ha = 47 kg N per ha**

* Sheep N excretion is more than 50% of total N excretion therefore 130 kg N per ha limit applies.

Figure 6 - Excluding manure from out-wintered livestock (apart from dairy cows) from storage calculation where more than 50% of livestock manure nitrogen produced during the out-wintered period comes from cattle.



Example (b)(1): Out-wintering 50 suckler cows on 40 ha of grassland (cattle only)

Stock type	Number	N excretion rate	Total N excretion
Suckler cow	50	52	2,600
Cattle under 1 year	0		
Ewes	0		
Lambs under 1 year	0		
Total			**2,600**
N loading per ha during out-wintering period			**= 2,600 kg N per 40 ha = 65 kg N per ha**

Example (b)(2): Out-wintering 30 suckler cows and 150 ewes on 40 ha of grassland (more than 50% of N from cattle)

Stock type	Number	N excretion rate	Total N excretion
Suckler cow	30	54	1,560
Cattle under 1 year	0		
Ewes	150	9	1,350*
Lambs under 1 year	0		
Total			29
N loading per ha during out-wintering period			**= 2,910 kg N per 40 ha = 72.75 kg N per ha**

* Sheep N excretion is less than 50% of total N excretion therefore 85 kg N per ha limit applies.

8.2 Standards for livestock manure, silage and silage effluent storage facilities

8.2.1 Maintenance and management of storage facilities

All storage facilities for livestock manure, silage and silage effluent must be maintained free of structural defect and be managed and of such a standard as is necessary to prevent run-off or seepage, directly or indirectly, into a waterway or water contained in an underground waterbody. Some comparisons of good and poor storage maintenance and management are shown in the photographs in this section.

It is particularly important that silage and slurry stores do not leak, so the walls of these structures should be routinely inspected for visible cracks or seepage. Basal leaks are harder to detect, particularly in filled silos, but scorched vegetation will provide clues that there may be a problem. Again, any open waterways should be checked for signs of pollution (**see Annex A**). Intercept channels at the front of silos should be kept free of debris to maintain their drainage capacity and to prevent overflows.

Photo 6 - Leaking silage clamp

Photo 7 - Well maintained silage clamp

Photo 8 - Appropriate storage of baled silage

Photo 9 - Protecting silage pit wall-floor joints

Above-ground slurry stores present particular risks in that, if they fail, there is rarely any other containment for the slurry. As well as causing severe pollution, there may be damage to farm-yards and equipment, and possibly livestock fatalities. Periodic structural checks of circular stores are strongly recommended, with emphasis on the condition of the internal walls which can be subject to unseen damage. Such checks are increasingly important as older tanks approach their 20 year recommended lifespan. When building new above ground stores, consideration should be given to their siting to minimise the risk, in the event of a failure, of slurry reaching a waterway or damaging other farm facilities.

Photo 10 - Freeboard on above ground slurry tank not being maintained

Photo 11 - Well maintained above ground slurry tank

Photo 12 - Overflowing effluent tank not being managed

Photo 13 - Silage clamp with well maintained channels draining to effluent tank

8.2.2 If I need to build or enlarge storage facilities, what standard is required?

All new or substantially enlarged slurry, silage and effluent storage facilities (completed after 1 December 2003), must comply with construction standards and other requirements specified in the NAP Regulations and summarised in **Annex Q**. These also apply to substantially reconstructed stores unless, in the opinion of NIEA, pollution risks have been decreased by the reconstruction. Middens must have adequate effluent (run- off) collection and storage facilities and, as run-off from farmyard manure, poultry litter and aerobic digestate fibre is considered slurry, these facilities must also comply with the standards set out in the NAP.

These requirements were previously set out in The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations (Northern Ireland) (2003) (SSAFO Regulations), but have now been included in the NAP. Further, detailed, guidance on standards for storage

http://www.daera-ni.gov.uk/articles/silage-slurry-and-agricultural-fuel-oil-ssafo-storage or by using the contact details provided in **Annex V**.

Remember!

One of the requirements for new underground storage facilities is that they are situated at least 10 m from any waterway.

All new above ground slurry stores constructed from 1 January 2020 must be sited at least 50 m from any waterway.

In addition any slurry tank (excluding lagoons), pit (other than a reception pit) or above ground slurry store constructed, substantially enlarged or substantially reconstructed from 1 January 2020, which is not contained within or underneath a roofed building, must be fitted with a cover to minimise emissions of odour and ammonia.

If you are building or enlarging storage and think you may be affected, you should contact NIEA at the planning stage to discuss siting of the store.

If you are building or enlarging slurry storage, you may also require planning permission. Any development must comply with certain requirements set out in the relevant legislation

- Part 6 of Schedule 1 to the Planning (General Development) (Amendment) No.2) Order (Northern Ireland) 2013, Agricultural Buildings and Operations. For more information contact your local Planning Office. Additional information can be found on-line at: www.daera-ni.gov.uk/topics/environmental-advice-planning.

NIEA must be given at least 28 days notification about any new or substantially enlarged or reconstructed slurry silage storage and silage effluent tanks before they are brought into use for the first time. This form must to be signed by a chartered or civil engineer to confirm the storage complies with the standards in the Regulations. A notification form can be downloaded from the NIEA website at: www.daera-ni.gov.uk/articles/silage-slurry-and-agricultural-fuel-oil-ssafo-storage.

8.2.3 How do these standards apply to existing storage?

The construction standards apply to all slurry and silage storage and silage effluent tanks constructed or substantially enlarged after 1 December 2003. They will also apply to storage which has been substantially reconstructed since that date, unless, in the opinion of NIEA, the work reduces the risks of pollution.

Storage completed before 1 December 2003 is normally exempt from the construction standards set out in the Regulations. However, in some situations exempt structures may be found to be causing pollution, or are at risk of causing pollution; for example, due to a crack in a silo floor, or an overflow from a slurry tank. In such circumstances, NIEA can require action to be taken to bring the storage up to the standards within the NAP Regulations by issuing a Notice detailing the required improvements and the time period for compliance. If this notice is not complied with, the storage will cease to be an exempt structure.

8.2.4 What about storage of silage bales?

Silage compressed in the form of bales must be wrapped and sealed within an impermeable membrane or bag and stored at least 10 m from any waterway that effluent escaping from the bales could enter. Silage bales must also not be opened within 10 m of any waterway that escaping effluent could enter.

Working with slurry - health and safety considerations

Take great care with slurry mixing and spreading and beware of deadly slurry gases. Follow the Health and Safety Executive guidance on mixing slurry which is set out below. Further information on the best practice to use when handling slurry is available on their website at: https://www.hseni.gov.uk/articles/slurry-working-safely-slurry

Safe system of work for mixing slurry

- Keep children away from the area at all times when working with slurry.
- If possible, mix on a windy day.
- Take all animals out of the building before starting to mix slurry.
- Open all doors and windows.
- Use outside mixing points first.
- If slats are removed, cover exposed areas of the tank beside the pump/mixer to stop anything falling in.
- Start the pump/mixer - then stay out of the building for as long as possible - **at least 30 minutes** or longer depending on the size of the tank.
- Any time you have to go into the building, try to make sure that another adult knows what you are doing and can get help if necessary.
- If you have to re-enter the house to move the pump, or change the direction of the pump, leave the building as soon as this is done. Do not go back in for as long as possible - **at least another 30 minutes or longer depending on the size of the tank.**
- Avoid naked flames, as slurry gas mixture is flammable.
- Do not stand close to the pump/exhaust of a vacuum tanker when it is being filled.

8.3 Storing farmyard manure, poultry litter and anaerobic digestate fibre

8.3.1 Where can I store farmyard manure, poultry litter and anaerobic digestate fibre?

Farmyard manure, poultry litter and anaerobic digestate fibre can be stored in middens with adequate effluent collection and storage facilities. Run-off from middens is classified as slurry under the NAP Regulations and must be stored and applied to land accordingly. These manures can also be stored in compact heaps in the field where they are to be applied.

Photo 14 - Midden with run-off not collected - pollution risk

Photo 15 - Midden with all manure contained and run-off collected

Photo 16 - Appropriately sited farmyard manure field heap on a site well away from field drains and watercourses

Photo 17 - Run-off from a midden is slurry and must be collected and stored

8.3.2 How long can I keep farmyard manure, poultry litter or anaerobic digestate fibre in a field heap?

Field heaps are intended to be for short term storage, prior to spreading. Farmyard manure, poultry litter and aerobic digestate fibre should be kept in field heap for a maximum of 120 days before spreading. However, if, at the end of that period, the situation arises where soil or weather conditions are not suitable for spreading (and environmental damage is likely to occur if you do spread), you should make a note of the situation so that you can demonstrate your reasoning for exceeding the storage time limit to NIEA.

Fires in manure, poultry litter and anaerobic digestate fibre heaps

There are some reports from the UK and other countries of fires occasionally occurring in both uncovered and covered manure heaps. Some of these are due to vandalism, while others are the result of biological decomposition processes and particular environmental conditions combining to create conditions suitable for combustion. These occurrences are rare, but to minimise the risk, the guidance set out in **Annex R** should be followed.

8.3.3 Are there any restrictions on where I can place farmyard manure, poultry litter and anaerobic digestate fibre heaps in the field?

Farmyard manure, poultry litter and anaerobic digestate fibre heaps must not be stored in the same location of the field year after year, or on land that is waterlogged, flooded or likely to flood, or within:

- 50 m of lakes for farmyard manure/100 m for poultry litter and anaerobic digestate fibre;
- 20 m of any other waterway for farmyard manure/40 m for poultry litter and anaerobic digestate fibre, including open areas of water, open field drains or any drain which has been backfilled to the surface with permeable material such as stone/aggregate;
- 50 m of a borehole, spring or well;
- 250 m of a borehole used for a public water supply; or
- 50 m of exposed cavernous or karstified limestone features (such as swallowholes and collapse features).

8.3.4 Are there additional controls on poultry litter or anaerobic digestate fibre field heaps?

Yes. The storage of poultry litter and anaerobic digestate fibre in field heaps must be notified to NIEA prior to placement in the field. To notify NIEA email: agricultural.regulation@daera-ni.gov.uk. As detailed in **Section 8.3.2**, poultry litter and anaerobic digestate fibre field heaps must be set further back from lakes and other waterways than farmyard manure heaps. Any field heaps containing poultry litter or anaerobic digestate fibre must also be covered with an impermeable membrane within 24 hours of placement in the field.

It is essential that field heaps of poultry litter and anaerobic digestate fibre are covered and properly located and managed to prevent water pollution. Check all field heaps frequently to ensure that the impermeable cover remains in place completely covering the heap and that there are no signs of run-off.

8.3.5 Do I have to cover poultry litter which is stored in a midden?

For PPC licensed poultry farms, it is a licensing requirement to either roof or cover poultry litter middens. For other farms it is not a legal requirement but is considered best practice. It prevents scavenging birds, such as crows, potentially transferring carcasses to grazing land, thus reducing the risk of botulism spread. It also reduces the amount of effluent to be collected, stored and spread and is likely to reduce ammonia emissions from the litter.

Poultry litter and botulism

Botulism is a severe, often fatal form of food poisoning which can affect most animals and birds, and occasionally humans. The disease has emerged as a threat to grazing animals such as cattle, sheep and goats in Northern Ireland in recent years. It is usually fatal in livestock and can cause serious economic losses to farmers.

The disease can be spread by scavenging animals which gain access to poultry carcasses in the litter after it has been stored or spread on pasture. Therefore, it is essential that precautions are taken to reduce the risk of botulism in grazing animals.

Care must be taken to ensure any carcasses are removed from the litter as soon as possible, at least before storage and spreading. Where poultry litter is stored in a field it must be compact and covered with an impermeable membrane as soon as possible and within 24 hours of placement in the field.

Poultry litter should be deep ploughed into arable ground. Poultry litter should not be spread on agricultural land that is to be grazed, or from which silage or hay is to be harvested, in the same year.

Further information and advice is available in DAERA's leaflet 'Botulism in Cattle' available from the DAERA website at www.daera-ni.gov.uk/publications/botulism-livestock, or by contacting Agri-Food and Biosciences Institute (AFBI) veterinary laboratories at Stormont (Tel: 028 9052 5680) or Omagh (Tel: 028 8224 3337) or on the AFBI website www.afbini.gov.uk).

Advice is also given in CoGAP which is available on the DAERA website at: www.daera-ni.gov.uk/publications/code-good-agricultural-practice-cogap

8.4 Storage of other manures prior to field application

An exemption from waste management licensing is required for the storage of some non-livestock, manure products (including sewage sludge, waste anaerobic digestate (see **Section 1.5**), abattoir waste other than paunch (stomach contents) and fish farm residues) prior to field application. An application for exemption must be made to NIEA. Contact details may be found in **Annex V**.

Manure and silage storage - what will happen during an inspection?

NIEA staff will check yard areas, silos and middens to ensure that slurry, manure, silage effluent and dirty water is being appropriately contained and not giving rising to pollution. The integrity of your silage effluent and slurry tanks will be checked and the capacity of your slurry stores assessed against the calculated quantity of slurry to be stored.

If you have recently built storage, NIEA will check their records to confirm you notified them about it before bringing it into use. All new structures must meet construction and other standards set out in the NAP Regulations (see **Annex Q**).

Photographs will be taken as a record of the inspection and, in some cases, samples may be taken.

Section 9 - Land management

9.1 Where can I place supplementary feeding sites and livestock drinking points?

Care should be taken with the siting and operation of supplementary livestock feeding and drinking sites to ensure that there is not a significant risk of pollution of any waterway:

- From 1 January 2020, where there is a significant risk of pollution of any waterway, supplementary livestock feeding sites must be sited a minimum of 20 m from any waterway.
- From 1 January 2022, where there is a significant risk of pollution of any waterway, livestock drinking sites must be sited a minimum of 10 m from any water way.

Excessive trampling/poaching by livestock or vehicle rutting can occur around supplementary feeding and drinking sites, and may present a significant risk of pollution if sited close to a waterway and not managed appropriately according to ground and climate conditions.

Significant risk of pollution may arise from one or more of the following:

- Bare soil with no visible vegetation;
- Bare soil often mixed with excessive livestock manure;
- Deep bare soil trenches/ruts caused by vehicle tracks; and
- Waterlogged soils with livestock ‘wading in muck”.

Photo 18 - Unacceptable supplementary feeding

Photo 19 - Acceptable supplementary feeding site

Remember to regularly check supplementary feeding and drinking sites for poaching and potential runoff, particularly during wet weather, and move either the stock, feeders or drinkers if there is a risk of pollution of any waterway.

9.2 Do I have to manage soil after cropping?

Yes. After harvesting a crop, you must ensure that from harvest until 15 January in the following year one of the following conditions is met on that land at any time:

- the stubble of the harvested crop remains in the land; or
- (a) the land is sown with a crop which will take up nitrogen from the soil, or
  (b) where soil or weather conditions prevent a subsequent crop from being sown, appropriate measures are put in place to limit soil erosion.

Green cover, such as grass or a crop which takes up nitrogen, or leaving the stubble in the land will help prevent soil erosion and loss of nutrients.

Photo 20 - Crop stubble left over winter

This requirement under the NAP Regulations is the same as the Cross-Compliance GAEC 4 Minimum Soil Cover standard.

9.2.1 What counts as a crop that will take up soil nitrogen?

Except for legumes such as clovers, peas and beans, any crop likely to produce some growth in autumn after sowing would count as a crop that will take up soil nitrogen.

Common examples would include:

- grass reseeds;
- winter cereals; and,
- catch crops or cover crops.

Sowing an autumn growing crop as early as possible will ensure a well developed root system which is better able to absorb soil nutrients and lower the potential for nutrient losses by leaching.

9.2.2 What are appropriate measures to limit soil erosion?

Appropriate measures would include chisel ploughing or, where soils are waterlogged, leaving crop residues undisturbed but minimising the potential for soil erosion by, for example, installing sediment traps in vulnerable locations or by creating a barrier of roughly cultivated soil between a slope and a vulnerable watercourse. A barrier of roughly cultivated soil can be created by ploughing three or four furrows between the slope and the vulnerable watercourse. This will trap any sediment and nutrient laden water before it reaches a watercourse. Alternatively a rough grass headland may be left which would serve a similar purpose.

Photo 21 - Chisel ploughing

Photo 22 - Sediment fencing

9.3 Do I have to manage soil after grass leys are ploughed?

Where grass leys are grown in rotation with arable crops, the first crop should be sown as soon as possible after the grass has been ploughed to minimise the loss of nitrogen.

Section 10 - Record Keeping

10.1 What records do I have to keep?

You need to keep sufficient records so that, during an inspection, NIEA will be able to calculate (where applicable) for your farm business:

- the livestock manure nitrogen loading;
- the number of weeks' manure storage capacity.
- the amount of nitrogen from chemical fertilisers and non-livestock manures applied to grassland;
- the amount of nitrogen from all sources applied to any crops other than grass and the crop nitrogen requirement;
- the amount of chemical phosphate applied to any land and the crop phosphate requirement;
- (from 2017) the amount of P-rich manures applied to any land and the crop phosphate requirement; and
- (from 2020) the amount of anaerobic digestate applied to any land (must include a nutrient analysis from the producer) and the crop phosphate requirement;

NIEA will use these calculations to check if you have complied with the relevant limits set out in the Regulations and described in this guidance. If you don't have sufficient records for the calculations to be completed, this would be a breach of the Regulations and will have implications for your Area-Based Scheme payments.

The level of records required will depend on the circumstances of your farm. For example, the requirements for record keeping for many farmers will be met if they provide a copy of their SAF form, a herd/flock register along with fertiliser details such as detailed invoices and noting the size of livestock manure facilities. This information will then allow NIEA to determine whether compliance has been achieved.

Table 5 outlines what records are required for different farm types and recommends various sources where this information can be found.

10.2 Do I have to carry out calculations for my farm?

It is not a requirement to calculate certain values for your farm such as the livestock manure nitrogen loading and the number of weeks' storage capacity on farm. However, if you do not complete the calculations, you may be unaware of your position and may be in breach of the Regulations.

Note that if you are required to complete a fertilisation plan you will need to carry out the required calculations.

Table 5 - Record requirements and recommended record sources 2019-2022

Please note that these are only recommended record sources. If you have another method of recording the required information which will allow NIEA to make a full assessment of your farm business's position against the various measures, then this is satisfactory.

Information required and recommended record sources		
All farm businesses		
Eligible agricultural area	If claiming Basic Payment Scheme	Copy of relevant SAF form.
		Letter from DAERA stating the area deemed eligible to activate entitlements each scheme year and your latest DAERA map.
	If not claiming Basic Payment Scheme	If not claiming Basic Payment Scheme, evidence of the fields and the area that you are farming each year.
	Common land	Provide evidence of the rights of use and area of common land if applicable.
If you keep livestock		
Livestock numbers	All livestock types	Enterprise management software or numbers recorded in the NAP Guidance Workbook, which is available on-line www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022 Stock numbers should be taken at least on the first day of each alternative month. For example, 1 Feb, 1 Apr, 1 Jun, 1 Aug, 1 Oct, 1 Dec.
		Or
	Cattle	DAERA Herd Register for Bovine Animals or APHIS online records[3].
	Sheep	DAERA Flock Register or APHIS online records[3].
	Pigs	DAERA Herd Register for Pigs.
	Poultry	Company audit records or welfare legislation records or quality assurance records or egg marketing legislation records.

3 Aphis online records can be accessed at www.daera-ni.gov.uk/onlineservices

Information required and recommended record sources		
If you keep livestock and store organic manures		
Livestock manure storage capacity	Storage capacity	On farm confirmation of storage capacity, for example, dimensions of tanks, e.g. 25 m x 4 m x 1.8 m. ***Or*** Remember to include slurry collected from open yards, roof water (if allowed to flow onto dirty yards) and an allowance for silage effluent in your calculations.
	Housing term	Numbers and length of time livestock housed during winter.
	Separated cattle/sheep slurry	Note of amount of cattle/sheep slurry separated.
	Rented storage facilities	Rental agreements containing details of any rented storage facilities or silage clamps or livestock contract rearing arrangements **(Annex L)**.
If you keep livestock and need a storage allowance		
Livestock manure storage capacity allowances (if applicable)	Out-wintered livestock	Numbers, type and length of time livestock out-wintered.
		Note on SAF form or DAERA farm map of area and location of land used to out-winter.
	Bedded livestock	Numbers, type and length of time livestock bedded.
	Poultry litter stored in a midden	Details of poultry litter which is stored in a midden.
	Poultry litter stored in a field heap	NIEA will check that a notification has been sent for any poultry litter field heaps.
	Slurry exported to processing facility	Valid contractual agreements with processing facilities or evidence of access to an approved treatment or recovery outlet **(Annex M)**.

Information required and recommended record sources		
If you use chemical fertilisers		
Chemical nitrogen (N) and phosphate (P_2O_5) usage	Annual chemical fertiliser stock balance	Record of fertiliser stock on 1 January - tonnage and N and P_2O_5 content **(Annex O)**.
		Record of fertiliser stock on 31 December - tonnage and N and P_2O_5 content **(Annex O).**
	Annual chemical fertiliser movements	Dated fertiliser invoices or receipts or a list of purchases showing: - certified N and P_2O_5 content of chemical fertiliser; and - tonnage bought/sold.
		The tonnage and N and P_2O_5 content of fertiliser imported in and exported off the farm (other than bought/sold), if applicable **(Annex O)**.
If you apply any organic manures apart from livestock manure to grassland		
Grassland fertiliser details	Total area of grassland	Grassland field areas from SAF form.
	Other organic manure fertiliser details (apart from livestock manure)	The type, amount and N content of organic manure applied to grassland area.
If you grow winter/spring wheat, barley or oats (N-max crops)		
N-max crop fertiliser details	Cropping regimes and their individual areas	Note the type of crops, for example, spring barley, winter wheat, and record on SAF form or DAERA farm map.
	N fertiliser application details	Type, amount and N content of all fertilisers containing N (chemical and organic including livestock manures) applied to each crop area.
	If N-max limits have been exceeded	Records of previous three years' total grain yield weights and total areas harvested for each crop type for which N-max limits have been exceeded.

Information required and recommended record sources		
If you grow any other crops		
Other crops fertiliser details	Cropping regimes and their individual areas	Note the type of crops, for example, potatoes, maize, and record on SAF form or DAERA farm map.
	SNS index for other crops	Previous crop grown.
		If known, soil type. If soil type is unknown the tables in **Annex H** may be used to establish SNS index.
	N fertiliser application details	Type, amount and N content of all fertilisers containing N (chemical and organic including livestock manures) applied to each crop area.
If you export or import organic manures		
Imported/ exported organic manures	All organic manures	Record of: - Amount and type of each manure. - Date imported/exported. - Name and Business ID of importer/ exporter. - Name and address of transporter (if 3rd party). See **Annex N** for example import/export records All manure exports must be submitted online to NIEA using DAERA online services by 31 January for the previous year.
	All digestates	Nutrient content of anaerobic digestate provided by the producer.
	Organic manures other than livestock manures	N content of organic manures (apart from livestock manures and spent mushroom compost) provided by the producer in accordance with waste or sewage sludge regulations or Quality Protocol.

Information required and recommended record sources		
If you apply chemical phosphate (P_2O_5) fertiliser (from 2020) to grassland, P-rich[4] organic manures or anaerobic digestate to all land.		
Phosphorus controls	Fertilisation Plan	CAFRE Crop Nutrient Calculator available at DAERA online services www.daera-ni.gov.uk/onlineservices or the NAP Guidance Workbook which is available at www.daera-ni.gov.uk/nutrient sactionprogrammeregulation2019-2022
		An electronic or paper format detailing: Size of each crop area, type of crop, results of *soil P test*, maximum phosphate recommendation, planned phosphate application details.
If you apply chemical phosphate (P_2O_5) fertiliser.		
Phosphorus controls	Size and location of each field to which chemical P_2O_5 fertiliser or P-rich manure has been applied	Note the fields to which chemical phosphate fertiliser has been applied to on SAF form or DAERA farm map.
	Type of crop sown	Type of crops grown in above fields noted on the SAF form or DAERA farm map.
	Results of soil P test	DAERA farm map indicating fields sampled or soil sample results showing field identification details.
		Results of soil analysis with UK Accreditation (or National Equivalent) statement for the soil P test, relating sampling site to Olsen extractable P content and soil P index.
	Phosphate fertiliser application details	Type, amount and available phosphate content of all fertilisers containing phosphate (chemical and organic including livestock manures) applied to fields to which chemical P_2O_5 fertiliser/ P-rich manure has been applied.
		Dates of applications.

Remember!

Refer to the previous NAP and Phosphorus Guidance Booklet, published in 2015, in relation to keeping records relating to the previous NAP period (2015-2018).

4 P-rich organic manures are those containing more than 0.25 kg of total P per 1 kg of total N.

10.3 How do I complete a fertilisation plan?

A fertilisation plan for non-derogated farms should be completed prior to applying fertilisers using the CAFRE online Crop Nutrient Calculator available at DAERA online services; www.daera-ni.gov.uk/onlineservices.

Using the Crop Nutrient Calculator will enable you to:

- Determine the N, P_2O_5 and K2O required by crops
- Calculate the amount of nutrients supplied by organic manures
- Select an appropriate chemical fertiliser and application rate and
- Fulfil your requirement to have a fertilisation plan

The Crop Nutrient Calculator is designed to assist with nutrient management planning. Simply enter your crop details, soil analysis results and intended fertiliser usage. The crop nutrient report produced will satisfy all the requirements for a fertilisation plan and can be updated as required.

You may also present a fertilisation plan using an alternative format either paper or electronic. You are strongly advised to complete a fertilisation plan giving consideration to nitrogen, phosphate and other nutrients such as potash and sulphur.

A fertilisation plan must include the following:

- Size of each land area under the same cropping regime, soil type and soil P index
- Crop type
- Results of soil P test
- Crop P requirement
- Planned application of organic manures
- Planned application of chemical P fertiliser
- Total P to be applied

The above is the minimum you must include in a fertilisation plan for a non-derogated farm. A fertilisation plan template can be found in **Annex T** and within the NAP workbook 2019-22, available at www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022.

If the planned application of manures and/or chemical fertiliser changes during the year, the fertilisation plan should be revised within 7 days of the change occurring.

If you are using an electronic format retain a printout/report for inspection.

Derogated farms must use the more detailed NAP Derogation Fertilisation Plan which requires additional information. The NAP Derogation Fertilisation Plan 2019-2022 is available at www.daera-ni.gov.uk/articles/nitrates-directive.

10.4 What period do I have to keep records for?

Records must be kept for each calendar year, from 1 January to 31 December. Most annual records must be prepared by 30 June of the following year and be retained for a period of five years. For example, for the 2019 calendar year records must be prepared by 30 June 2020.

The one exception to this is records for exports of organic manure off the farm. These records must be submitted online to NIEA using DAERA online services, available at www.daera-ni.gov.uk/onlineservices by 31 January for the previous calendar year. For example, for records for 1 January to 31 December 2019 must be submitted by 31 January 2020. A copy of this record should also be kept on farm, again, for five years.

10.5 What if I am exporting or importing organic manures?

If you are importing or exporting organic manures (for example, livestock manures, anaerobic digestate or sewage sludge), you need to keep a record of the quantity and type of each manure moved on or off your holding, the date of any movements and the name and address of who it was imported from or exported to. This applies regardless of whether the imports/exports are within Northern Ireland or elsewhere. In addition, when manure is exported, the farm business identification numbers of importers must be recorded. If a third party transports the manure, their name and address must also be recorded. Example record sheets are set out at **Annex N**.

If you are importing anaerobic digestate you must retain a record of the nutrient content analysis.

Remember!

Records of exports of organic manure must be submitted online to NIEA using DAERA online services by 31 January for the previous calendar year.

10.6 What if I am exporting or importing organic manures to/from the Republic of Ireland?

As well as records to be kept for NAP, imports and exports of livestock manure (including poultry litter and slurry) between Northern Ireland and the Republic of Ireland (ROI) are regulated by animal by-product (ABP) legislation[5]. Any cross-border exports or imports must be authorised by DAERA in Northern Ireland and the Department of Agriculture, Food and the Marine (DAFM) in ROI and accompanied by a veterinary health certificate. Details on how to apply for authorisations and certificates are set out in **Annex P**.

5 EU Regulation 1069/2009 and related DAERA Regulations.

Record keeping - what will happen during an inspection?

You must have your records available for examination by NIEA during an inspection. Records must be compiled for each calendar year and be ready for inspection by 30 June of the following calendar year. For example, the records for the calendar year 1 January 2019 to 31 December 2019 must be ready for inspection by 30 June 2020. You must retain the records for the last five calendar years.

Records need to be adequate for NIEA to assess your compliance with the various limits set out in the Regulations.

If you export organic manure within Northern Ireland, NIEA may contact the farm businesses you export to, to verify the movements. If you export manure to the ROI, NIEA may ask to see your ABP documentation or contact DAERA or DAFM for verification.

Section 11 - Further help and training

11.1 Online farm nutrient calculators

If you need help with the NAP measures on nutrient limits, storage requirements and record keeping, you can log onto www.daera-ni.gov.uk/ and use the Farm Nutrient Calculators which are designed to help you meet the requirements of the NAP.

There are five Farm Nutrient Calculators which are free, easy to use, available 24 hours per day, secure and confidential:

- **Nitrogen loading calculator:** Helps you to calculate the nitrogen loading for your farm and check if you are below the 170 kg N per ha per year limit or, if operating under a derogation, below the 250 kg N per ha per year limit.
- **Manure storage calculator:** Helps you to calculate the weekly slurry, dirty water, manure production and current storage capacity for your farm and check if you have the required 22 or 26 weeks' storage or how much additional storage is needed.

(**Livestock numbers** are required for the above two calculators. An accurate record of cattle type and numbers kept each year since 2007 can be obtained using the 'Nitrate Animal Count' function on APHIS Online.)

- **Crop nutrient calculator:** This programme will help you to comply with nutrient limit requirements and draw up a nutrient management plan (NMP) for your farm:

- determine the N, P_2O_5 and K_2O required by crops;

- calculate the amount of nutrients supplied by organic manures;

- select the correct chemical fertiliser and application rate; and

- retain information required for record keeping.

(Although not a requirement of the Regulations, this calculator also provides information in relation to potash requirements. When this calculator is used for all three main nutrients (N, P_2O_5 and K_2O) it will help to improve soil fertility, optimise application rates, increase crop yields and help to reduce chemical fertiliser costs.)

- **Phosphorus balance calculator:** If operating under a derogation, helps you calculate the phosphorus balance for your farm and check that the limit of 10 kg P per ha per year has not been exceeded. For all farms it helps you manage phosphorus inputs and outputs to use phosphorus efficiently.
- **N-max for grassland calculator:** Helps you to check that nitrogen applications to the whole grassland area on the farm do not exceed the NAP limits.

11.1.1 Where can I find the farm nutrient calculators?

Step 1: Go to www.daera-ni.gov.uk/.

Step 2: Click DAERA online services and then the Login button.

Step 3: To access DAERA Online Services you can choose to register/log in with nidirect or Government Gateway. If you have not yet registered, click 'I need an account' and follow the on-screen instructions. (Remember to select APHIS Online if you wish to use this service).

Step 4: Once registered, log in and select Farm Nutrient Calculators.

Step 5: Select the Farm Nutrient Calculator you wish to use.

11.2 Training

CAFRE offers the following training courses to help farmers understand the requirements of these Regulations:

- **NAP Information Training** - general information on NAP requirements and record keeping.
- **Derogation Training** - information on how to meet the additional requirements of the Nitrates derogation.
- **Nutrient Management Planning** - a further detailed course on matching nutrient inputs to crop requirement for economic crop production, the long term fertility of the soil and to comply with the Nutrient Regulations.

To register your interest for any of these courses please contact CAFRE by calling 0300 200 7841 or go to www.cafre.ac.uk

11.3 Information

DAERA publishes the Farm Advisory System (FAS) Newsletter in February and September each year and posts it to all farm businesses registered with DAERA. The newsletter aims to bring farmers up to date with news and developments in topics including:

- Cross-Compliance.
- BPS greening Regulations and the maintenance of agricultural area.
- Rural development programmes (RDP) aiming at farm modernisation and competitiveness building.
- Water Framework Directive (WFD).
- Sustainable use of pesticides Directive.

As the NAP is part of Cross-Compliance, the FAS Newsletter will contain information relating to nutrients designed to help farmers manage their businesses in compliance with these Regulations.

Section 12 - Inspection and Enforcement

12.1 Who will be responsible for inspection and enforcement?

Inspection and enforcement of the NAP Regulations is carried out by NIEA, an agency within DAERA. NIEA will seek to protect and conserve the environment through the consistent and fair application of legislation. They will work co-operatively with those they regulate and will offer information and advice where appropriate.

NIEA officers are authorised by law to carry out farm inspections for Cross-Compliance and a range of environmental legislation including the NAP Regulations and pollution investigations under the Water (Northern Ireland) Order (1999).

How do I know if an inspector is genuine?

For a planned inspection, NIEA will normally contact you in advance to confirm the date and time of your inspection. However, if officers have been unable to contact you, or are responding to a pollution referral, they may arrive on your farm unannounced.

All NIEA officers will carry photographic identification (a warrant card). If you are concerned that an inspector is not genuine, please ring 028 9263 3486 or 028 9262 3280 to confirm their identity.

12.2 Which farms will be inspected?

The Nitrates Directive underpins one of the Statutory Management Requirements under Cross-Compliance (SMR 1 Protection of Water against Nitrate Pollution), with NIEA being the competent control authority to carry out these inspections. DAERA must also review and report to the European Commission on the effectiveness of the NAP Regulations, including compliance reports. Each year, NIEA use SAF data and other environmental information to carry out an environmental risk assessment to identify a list of farm businesses which will be inspected under Cross-Compliance. At least 1% (5% if operating under an approved derogation) of farms claiming the Area-Based Schemes covered by Cross-Compliance must be inspected each year, and this percentage may be increased depending on the extent of non-compliance. In addition, NIEA must follow up on any breaches of the NAP Regulations that they witness or that are reported to them by other people.

12.3 Will I be given notification of an inspection?

There is no requirement for NIEA to provide advance notice of a planned inspection. However, provided that the purpose of the inspection is not jeopardised, NIEA will contact you to confirm the date and time of your inspection. It is a legal requirement to allow an inspection to take place. Failure to allow an inspection to take place will be notified to DAERA Paying Agency and as a result you may no longer be considered eligible to receive direct agricultural support. If NIEA are responding to a pollution referral, they may arrive on the farm unannounced.

12.4 What about bio-security on my farm?

All NIEA staff carrying out farm inspections will have equipment to disinfect their vehicle and footwear prior to entering and leaving your farm. NIEA staff will also follow a Health and Safety (H&S) risk assessment protocol during their farm visit. Where your H&S or bio- security requirements exceed NIEA protocols, staff will comply with your requirements.

12.5 What will happen during an inspection?

There are four aspects to the farm inspection:

12.5.1 Inspection of farm records

You must have your records available for inspection (see **Section 10.1** for the records that are needed). These records must be compiled for each calendar year and most must be ready for inspection by 30 June of the following calendar year. For example, the records for the calendar year 1 January 2015 to 31 December 2015 must be ready for inspection by 30 June 2016. The one exception to this is records for exports of organic manure off the farm. These records must be submitted online to NIEA using DAERA Online Services by 31 January for the previous calendar year. For example, records for 1 January to 31 December 2019 must be submitted by 31 January 2020. A copy of this record must also be kept on farm. You need to retain all records for the last five calendar years.

12.5.2 Land inspection

NIEA staff will give you the option to accompany them during their inspection of your land and farm facilities. They will in particular wish to inspect areas of your land which appear to be most vulnerable to pollution. This would, for example, include fields adjacent to waterways, boreholes, wells or springs.

12.5.3 Inspection of farm facilities such as slurry stores, yards and middens

Your farm facilities will also be inspected. NIEA staff will check yard areas, silos and middens to ensure that slurry, manure, silage effluent and dirty water is being appropriately contained and not giving rise to pollution. The integrity of your storage tanks for slurry and silage effluent will also be checked and the capacity of your slurry stores will be assessed and checked against the calculated quantity of slurry to be stored.

Since 2003, if you build or substantially enlarge storage, you are required to notify NIEA before you bring this into use. NIEA will check their records to confirm that you have done this. Failure to have done so may result in a breach of the Regulations which may have implications for your BPS.

12.5.4 Completion of the report form

A report form will be completed during the visit. Photographs will be taken as a record of the inspection and in some cases samples may be taken.

You will be provided with informal feedback at the end of the visit. Any areas of concern or non-compliance will be highlighted and any remedial action will be agreed with you. Where there has been non-compliance NIEA will write to you to confirm the findings of the inspection and any areas of improvement that may be required. If NIEA has asked you to carry out remedial works and these works have not been completed within the given timescale, there may be additional non-compliances.

12.6 What happens after an inspection?

If your farm was fully compliant, you will not receive any further correspondence from NIEA regarding the inspection. Where there has been non-compliance NIEA will write to you to confirm the findings of the inspection and any areas of improvement that may be required. NIEA will aim to provide this letter within 28 days of completion of the inspection (which will include the time period for any verification checks) and no later than three months after completion of the inspection.

12.7 What happens if my farm is non-compliant?

NIEA will seek to work co-operatively with farmers to secure improved practice on the farm. Unfortunately enforcement action will need to be taken in some cases to ensure compliance. Any enforcement action will be in accordance with The DAERA Environment, Marine & Fisheries Group - Enforcement Policy which can be found at www.daera-ni.gov.uk/publications/environment-marine-and-fisheries-group-enforcement-policy or you can contact NIEA (see **Annex V** for contact details).

The action taken will depend on the circumstances of each case and a number of factors including severity, extent, permanence and repetition of the non-compliance. In some cases a Notice may be served. This Notice will detail the action required within a stated timescale of no less than 28 days. NIEA may at any time withdraw the notice, extend the period for compliance, or modify the requirements of the notice with the consent of the person it is served on.

12.8 Offences and penalties

Under the NAP Regulations it is an offence for any person to:

- fail to comply with the requirements of the Regulations;
- compile and provide false or misleading records; or
- fail to comply with a statutory notice.

It is also an offence for any person to obstruct, refuse or fail to assist NIEA staff or staff carrying out duties on behalf of NIEA in relation to the inspection and enforcement of the Regulations.

Breaches of the NAP Regulations will also be reported to DAERA Paying Agency who is responsible for applying any reductions in payments in respect of the Area-Based Schemes (including the BPS) under Cross-Compliance.

In some cases, where an offence has occurred, and the severity warrants it, NIEA may initiate prosecution and court procedures. Anyone found guilty of an offence under the NAP Regulations may currently be fined, on summary conviction, up to £5,000. For conviction on indictment, for an offence under the NAP Regulations, the penalty would be a fine or imprisonment for up to two years, or both.

12.9 What has been found on inspections to date?

Compliance with many measures has been very good and the majority of farms inspected in any year are fully compliant with the measures. There are, however, some key areas where non-compliance is more common including the management and storage of silage/ silage effluent, record keeping, storage of farmyard manure, fertiliser applications near waterways and general pollution arising from run-off from yards. Other breaches such as fertiliser applications on waterlogged ground or using inappropriate techniques, failing to cover poultry litter field heaps, leaking slurry stores and exceeding the livestock manure nitrogen loading limit have also been detected. NIEA will continue to monitor these areas and work with DAERA colleagues and stakeholders to raise awareness of these issues with the aim to improve practice.

12.10 Exceptional circumstances

Under certain exceptional circumstances, beyond the control of and not foreseeable by the farmer, a defence may be possibly considered for non-compliance with some of the measures in the Regulations. The measures where this may apply are:

- the requirement not to allow entry of fertiliser into waterways or groundwater;
- the closed spreading period for organic manures;
- the capacity of storage facilities for livestock manure and silage effluent to avoid water pollution;
- the number of weeks storage capacity for livestock manure;
- the requirement to make a fertilisation plan available on request (non-derogated farms only);
- the requirement to update a fertilisation plan within seven days of changes in agricultural practices (non-derogated farms only);
- the prohibition on spreading organic manures in adverse ground and weather conditions or on steeply sloping ground;

- the limits on the quantity of and time between solid organic manure, slurry and dirty water applications;
- the submission of manure export records online by end of January;
- the 170 kg N per ha per year livestock manure nitrogen loading limit;
- the requirement to spread farmyard manure or poultry litter or anaerobic digestate fibre stored in field heaps within 120 days;
- the requirement not to store field heaps on waterlogged or flooded land;
- the specifications for soil management after crop harvest; and

The onus will be on the farmer to take all reasonable precautions to manage these situations and to retain evidence to demonstrate that they did so and that they ensured good practice has been observed to minimise any risk of water pollution.

NIEA will assess these situations on a case-by-case basis, but examples could include extreme weather events such as regional floods or epizootics such as foot and mouth disease.

Remember!

For the purposes of Cross-Compliance, situations concerning breaches of the NAP that you believe fall under force majeure / exceptional circumstances must be notified to Area Based Schemes Payment Branch in writing, with relevant evidence, within 15 working days from the date on which you are in a position to do so.

12.11 Can I appeal any of these decisions?

There are two forms of appeal. The first is in relation to notices and the second relates to a reduction in Area-Based Scheme payments.

12.11.1 Appeals against notices

If you are served with a notice under the NAP Regulations you can appeal to the Water Appeals Commission within 28 days from the date on which the notice was served. The appeal should contain, or be accompanied by, a statement of the grounds of the appeal. The Water Appeals Commission has powers that include being able to: require the withdrawal of the notice; modify any of its requirements; or dismiss the appeal. You may wish to consider taking legal advice, at your own expense, before making an appeal.

The Water Appeals Commission can be contacted at:

Park House
87-91 Great Victoria Street
Belfast
BT2 7AG

Tel: 028 9024 4710
Email: info@pacni.gov.uk

12.11.2 Reviews against a reduction of Area-Based Scheme payments

If you are notified by DAERA of a decision to reduce payments in respect of an Area-Based Scheme covered by Cross-Compliance as a consequence of breaches of the Cross-Compliance requirements, you have a right to request a formal review. Details of the Review of Decisions Procedure will be sent to you with the DAERA letter advising you of the breach and subsequent penalty. Information is available on request from:

Area-Based Schemes Delivery Support Branch
Orchard House
40 Foyle Street
Derry/Londonderry BT48 6AT

Tel: 0300 200 7848
Email: DAERA.Area-basedSchemesDeliverySupportBranch@daera-ni.gov.uk

Details of the procedure are also available on the Department's website at: https://www.daera-ni.gov.uk/publications/area-based-schemes-review-decisions-procedure

12.12 How do I complain if I am not happy with what a member of NIEA staff does?

If NIEA have made a mistake they will apologise and try to put things right. NIEA has also set up a complaints procedure to tell you about your right to complain, how to make a complaint and how it will be dealt with. This can be found on www.daera-ni.gov.uk/publications/how-do-i-make-complaint-if-i-am-unhappy-quality-service-i-received or by contacting NIEA at the address provided in **Annex V**.

12.13 Contacting NIEA

If you need further advice on enforcement of the NAP Regulations during office hours please email: agricultural.regulation@daera-ni.gov.uk

In an emergency, please contact the NIEA Water Pollution Hotline: 0800 80 70 60.
See **Annex V**.

Key Definitions

Adequate effluent collection facilities means effluent collection facilities that are maintained free of structural defect and managed to prevent run-off or seepage, directly or indirectly, into a waterway or underground strata. Where applicable, the facilities must comply with the standards set out in the NAP Regulations.

Anaerobic digestate means a stable, sanitised material resulting from the mesophilic and thermophilic biological decomposition and stabilisation of biodegradable waste carried out under controlled anaerobic conditions, and which can be applied to land for the benefit of agriculture or to improve the soil structure or nutrients in land.

Anaerobic digestate fibre means the solid material separated out of anaerobic digestate.

Appeals Commission means the Water Appeals Commission for Northern Ireland. For contact details see **Section 12.11.1**.

Appropriate person means:

(a) the controller;

(b) any person permitted by the controller to carry out on their behalf, any activity described in the NAP Regulations;

(c) the owner of any storage facilities used for the storage of livestock manure, silage and silage effluent; and

(d) any person using such storage facilities for the storage of livestock manure, silage and silage effluent.

Arable crop means a crop other than grass, orchards, short rotational coppice, ornamentals and nurseries, forestry and multi-annual crops. Forage crops such as fodder beet, fodder rape, stubble turnips or any cereal crop used for forage are regarded as arable crops.

Area-Based Schemes means the following agricultural payment schemes:

Schemes that will continue in 2019 and beyond	**Schemes coming into effect from 2015 onwards**
Organic Farming Scheme	Basic Payment Scheme
Woodland Grant Scheme (agreements signed after 1 January 2007)	Greening Payment
Farm Woodland Premium Scheme (agreements signed after 1 January 2007)	Young Farmers Scheme
	Environmental Farming Scheme
	Forestry Expansion Scheme
	Forest Protection Scheme
	Woodland Investment Grant

All farm businesses claiming payments under these schemes must meet the Northern Ireland Cross-Compliance conditions.

Autumn means the months of September, October and November

Available nitrogen means forms of nitrogen that can be taken up by a crop immediately or within a short period.

Available phosphorus means forms of phosphorus that can be taken up by a crop immediately or within a short period.

Chemical fertiliser means any fertiliser in which the declared plant nutrients are in the form of minerals obtained by extraction or by physical and/or chemical industrial processes.

Basic payment scheme (BPS) is a scheme for financial assistance and is one of the new Area-Based Schemes introduced under the reform of the Common Agricultural Policy and replaced the Single Farm Payment (SFP) Scheme on 1 January 2015.

Chemical nitrogen fertiliser means any fertiliser containing one or more nitrogen compounds which is manufactured or blended by an industrial process.

Chemical phosphate fertiliser means any fertiliser containing one or more phosphorus compounds which is manufactured or blended by an industrial process.

Chemical potash fertiliser means any fertiliser containing one or more potassium compounds which is manufactured or blended by an industrial process.

Code of Good Agricultural Practice (CoGAP) means the "Code of Good Agricultural Practice for the Prevention of Pollution of Water, Air and Soil" published by the Department of Agriculture and Rural Development (as may from time to time be reissued).

Controller means in relation to a holding, the person charged with management of the holding for the calendar year in question and will be taken to be:

a. the person claiming direct agricultural aid payments for the agricultural area; or

b. where direct agricultural aid payments are not being claimed, the person who enjoys the decision making power, benefits and financial risks in relation to the agricultural activity carried out on the land.

Crop requirement means the amount of nitrogen, phosphorus and other plant nutrients in fertiliser which is reasonable to apply to land in any year for the purpose of promoting the growth of the crop having regard to the foreseeable nutrient supply to the crop from the soil and from other sources, including any previous applications of livestock and other organic manure and any chemical fertilisers. Crop requirement is estimated as described in the fertiliser technical standards (including this guidance).

Derogated holding means a grassland holding for which a derogation has been granted.

Derogation means a derogation from the limit of 170 kg/ha total N from livestock manure that can be applied to land each year up to a derogated limit of 250 kg/ha total N from grazing livestock manure. Derogation must be approved annually by NIEA and is valid for one calendar year.

Derogation application means an application for derogation submitted by the controller to NIEA.

Dirty water means water contaminated by organic manure, urine, effluent, milk and cleaning materials with a Biochemical Oxygen Demand (BOD) no greater than 2,000 mg/litre, total nitrogen content no greater than 0.5 kg per m^3, total phosphorus content of no greater than 0.04 kg per m^3 and total dry matter content no greater than 0.5%. Pictures showing where dirty water could be produced around a farmyard are found in **Annex B**.

Eligible agricultural area means any land suitable for agricultural activities including any common land used for grazing that you can demonstrate control over. It excludes areas under farm roads, paths, buildings, woods, dense scrub, rivers, streams, ponds, lakes, sandpits, quarries, areas of peat cutting, bare rock and areas fenced off or inaccessible for agricultural activity. It also excludes areas of forestry except where use of the forestry is ancillary to the farming of land for other agricultural purposes.

Eutrophication means enrichment of a waterbody by nitrogen (N) and/or phosphorus (P) leading to accelerated growth of plant life and an undesirable imbalance of organisms in the water and in the water quality.

Extensively managed grassland means grassland (typically grazing/one cut of silage or hay) receiving less than 60 kg of chemical nitrogen per hectare per year or with a nitrogen loading under 120 kg N per hectare per year.

Farm Nutrient Management Scheme (FNMS) means a scheme introduced in 2005 by DARD to provide financial assistance to farmers to install new or improved manure storage facilities on farms. The FNMS closed in 2006.

Farmyard manure (FYM) means a mixture of bedding material and animal excreta in solid form arising from the housing of cattle, sheep and other livestock, excluding poultry manure, but including spent mushroom compost and the stackable solids fraction from mechanical separation of slurry, excluding pig slurry.

Fertilisation account means an annual account prepared by the controller of a derogated holding to show fertiliser and manure use for a calendar year. Farms operating under a derogation must prepare and submit a fertilisation account for the previous calendar year to NIEA on or before 1 March each year. Further information on how to prepare and submit a fertilisation account can be found in the NAP Derogation Guidance Booklet.

Fertilisation plan means an annual plan prepared by the controller of a holding to show planned fertiliser and manure use for a calendar year.

a. Farms operating under a derogation must prepare and keep updated a fertilisation plan on farm by 1 March each year. Further information on how to prepare and update a fertilisation plan for a derogated farm can be found in the NAP Derogation Guidance Booklet.

b. All other farms must prepare and keep updated a fertilisation plan each year as described in **Section 10.3**, if applying chemical phosphate fertiliser to grassland, P-rich manures or anaerobic digestate to any land.

Fertiliser for the purposes of the NAP Regulations, is considered to be any substance containing plant nutrients which is applied to land to enhance crop growth. It includes chemical fertiliser and all types of organic manure including livestock manure as outlined in **Figure 1**.

Fertiliser technical standards means the latest edition of the AHDB Crop Nutrient Management Guide (RB209) (as may from time to time be reissued) and any supplementary guidance (including this guidance), and any other publication by DEFRA AHDB, or DAERA substituting the standards set out in the latest edition of the AHDB Crop Nutrient Management Guide (RB209) and any supplementary guidance.

Forage crop means any crop grown as food for animals.

Grassland means any land on which the vegetation consists predominantly of grass species.

Grassland holding means a holding where 80% or more of the agricultural area available for manure application is cultivated with grass.

Grazing livestock means cattle (with the exclusion of veal calves), sheep, deer, goats and horses.

Green energy crop means a crop utilised in an energy production system such as anaerobic digestion or biomass energy production. Examples include grass and maize silage, whole crop cereals, miscanthus grass and short rotation coppice.

Heavy rain means more than 4 mm of rain per hour.

Holding in relation to a controller means all the agricultural area managed by that controller.

Lake means a body of standing inland surface water.

Land application means the addition of materials to agricultural land whether by spreading on the surface of the land, injection into the land, placing below the surface of the land or mixing with the surface layers of the land but does not include the direct deposition of manure onto land by grazing animals.

Land other than grassland means any eligible agricultural land apart from grassland. This includes land used for arable crops, orchards, short rotational coppice, ornamentals and nurseries, and multi-annual crops.

Livestock means any animal kept for use or profit.

Livestock enterprise means any enterprise where livestock are kept.

Livestock manure means waste products excreted by livestock, or a mixture of litter and waste products excreted by livestock, even in processed form.

Low Emission Slurry Spreading Equipment (LESSE) means equipment which is used to spread slurry by; dribble bar, trailing hose, trailing shoe, soil incorporation or soil injection slurry application methods.

Midden means a storage facility with an impermeable base for solid, stackable organic manure.

NAP Regulations means the Nutrient Action Programme Regulations (Northern Ireland) 2019 as amended.

Nitrogen fertiliser means any substance, including chemical fertiliser and organic manures inclusive of livestock manures, containing one or more nitrogen compounds utilised on land to enhance growth of vegetation.

N-max crops means:

- winter and spring wheat;
- winter and spring barley; and
- winter and spring oats.

N-max system means a system introduced from 2015 to help specialist growers achieve yield potential without adversely affecting the environment. The maximum nitrogen application limits for N-max crops are based on a single value for each cereal type, taking account of soil type, SNS index and the standard yield expected for each cereal type in Northern Ireland growing conditions.

Organic manure means:

(a) livestock manure, and

(b) fertiliser, not being livestock manure or chemical fertiliser, derived from organic matter, and includes anaerobic digestate, sewage sludge, residues from fish farms and other organic wastes.

Phosphate (P_2O_5) means the phosphorus compound most commonly used in chemical fertiliser.

Phosphorus fertiliser means any substance, including chemical fertiliser and organic manures inclusive of livestock manures, containing phosphorus compounds and utilised on land to enhance growth of vegetation.

Pig enterprise means any enterprise with more than 10 breeding sow places or 150 finishing pig places.

Potash (K_2O) means the potassium compound most commonly used in chemical fertiliser.

Poultry enterprise means any enterprise with more than 500 places.

Poultry litter means a mixture of bedding material and poultry manure arising from the housing of poultry and with a dry matter content not less than 55%.

P-rich manures (phosphorus-rich manures) means organic manures which contain more than 0.25 kg of total P per 1 kg of total N. The proportion phosphorus to nitrogen of a number of common organic manures is set out in **Annex G** and examples of P-rich manures would include some anaerobic digestates and some pig slurries and manures.

Silage means any forage crop which is being, or has been, conserved by fermentation or preservation (including the use of additives) or both.

Silage effluent means:

(a) effluent produced from any forage crop which is being made, or has been made, into silage; or

(b) a mixture consisting wholly of or containing such effluent, rain or water coming from a silo, silage effluent collection system or drain.

Silo means any structure used for making or storing silage.

Slurry means:

(a) excreta produced by livestock whilst in a yard or building;

(b) a mixture of such excreta with bedding, rainwater, seepage, washings or any other extraneous material from a building or yard used by livestock or in which livestock manure is stored; or

(c) any other organic manure or any combination of these, of a consistency that allows it to be pumped or discharged by gravity at any stage in the handling process and includes dirty water that is stored with slurry or mixed with slurry.

Slurry contractor means a person who, in the course of a business, spreads slurry on an agricultural area and who is not claiming direct agricultural payments on that agricultural area.

Slurry storage system means:

(a) a slurry storage tank;

(b) any reception pit and any effluent tank used in connection with the slurry storage tank; and

(c) any channels and pipes used in connection with the slurry storage tank, any reception pit or any effluent tank.

Slurry storage tank includes a lagoon, pit (other than a reception pit) or tower used for the storage of slurry.

Soil phosphorus (P) index means the index number (0 to 4) assigned to the soil in accordance with Schedule 5 of the NAP Regulations to indicate the amount of phosphorus available from the soil to the crop.

Soil P test means the chemical analysis of phosphorus in a soil sample taken and analysed in accordance with Schedule 5 of the NAP Regulations and from any supplementary guidance.

Steeply sloping land means land which has an average incline of 20% or more in the case of grassland or 15% or more in the case of other land.

Total nitrogen means the sum of all nitrogen forms including nitrate, ammonia and organic nitrogen.

Underground waterbodies means waterbodies underlying the surface of any land. References to water contained in underground waterbodies do not include water contained in a public sewer, pipe, reservoir, tank or underground works.

Waste Regulations means the Waste Management Licensing Regulations (Northern Ireland) (2003).

Water pollution means the discharge, directly or indirectly, of nitrogen or phosphorus compounds from agricultural sources into the aquatic environment, the results of which are such to cause hazards to human health, harm to living resources and to aquatic ecosystems, damage to amenities or interference with other legitimate uses of water.

Waterlogged means soil where water appears on the surface of the land when pressure is applied.

Waterway means any river, stream, water course, inland water (whether natural or artificial) or tidal waters and any channel or passage of whatever kind (whether natural or artificial) through which water flows. It also includes a channel or bed of a waterway which is for the time being dry.

Glossary of terms

ABP	Animal By-Product
ac	Acre
AD	Anaerobic Digestate
AFBI	Agri-Food and Biosciences Institute
ANC	Areas of Natural Constraint
APHIS	Animal and Public Health Information System
DVI	Divisional Veterinary Inspector
BOD	Biochemical Oxygen Demand
BPS	Basic Payment Scheme
CAFRE	College of Agriculture, Food and Rural Enterprise
CoGAP	Code of Good Agricultural Practice
DAFM	Department of Agriculture, Food and the Marine
DAERA	Department of Agriculture, Environment and Rural Affairs
DEFRA	Department for Environment, Food and Rural Affairs
DM	Dry matter
DVO	Divisional Veterinary Office
EU	European Union
FAS	Farm Advisory System
FBIS	Farm Business Investment Scheme
FNMS	Farm Nutrient Management Scheme
FYM	Farmyard Manure
gal	Gallons
ha	Hectare
Hr	Hour
H&S	Health and Safety
K	Potassium
K_2O	Potash
kg	Kilogram
LU	Livestock Unit
LESSE	Low Emission Slurry Spreading Equipment
m	Metre
mm	Millimetres
m^3	Cubic metre
N	Nitrogen

NAP	Nutrients Action Programme
NI	Northern Ireland
NIEA	Northern Ireland Environment Agency
NMP	Nutrient Management Plan
P	Phosphorus
P_2O_5	Phosphate
PPC	Pollution Prevention and Control
QP	Quality Protocol
rad	Radius
RDP	Rural Development Plan
ROI	Republic of Ireland
SAF	Single Application Form
SMR	Statutory Management Requirement
SNS	Soil Nitrogen Supply
SSAFO	The Control of Pollution (Silage, Slurry, and Agricultural Fuel Oil) Regulations (Northern Ireland) (2003)
t	Metric tonne
tonne	Metric tonne
ton	Imperial ton
TRACES	Trade Control Expert System
UK	United Kingdom
UKAS	United Kingdom Accreditation Service
WFD	Water Framework Directive

List of tables, figures and photos (with hyperlinks)

Figures		**Page No.**
Figure 1	Fertiliser types and how they relate to each other.	21
Figure 2	Measuring the length of a slope.	28
Figure 3	Diagram to demonstrate a 20% and 15% slope.	29
Figure 4	Extensively managed grassland where the N Loading is less than 120 kg N per ha per year or less than 60 kg N per ha per year of chemical nitrogen fertiliser is applied to the grassland area.	51
Figure 5	Excluding manure from out-wintered livestock (apart from dairy cows) from storage calculation where more than 50% of livestock manure nitrogen produced during the out-wintered period comes from sheep, deer and/or goats.	58
Figure 6	Excluding manure from out-wintered livestock (apart from dairy cows) from storage calculation where more than 50% of livestock manure nitrogen produced during the out-wintered period comes from cattle.	59

Photos		**Page No.**
Photo 1	Spreading poultry litter	30
Photo 2	Inverted splash plate	32
Photo 3	Trailing shoe spreader	32
Photo 4	Injection system spreader	32
Photo 5	Band spreader	32
Photo 6	Leaking silage clamp	60
Photo 7	Well maintained silage clamp	60
Photo 8	Appropriate storage of baled silage	60
Photo 9	Protecting silage pit wall-floor joints	60
Photo 10	Freeboard on above ground slurry tank not being maintained	61
Photo 11	Well maintained above ground slurry tank	61
Photo 12	Overflowing effluent tank not being managed	61
Photo 13	Silage clamp with well maintained channels draining to effluent tank.	61

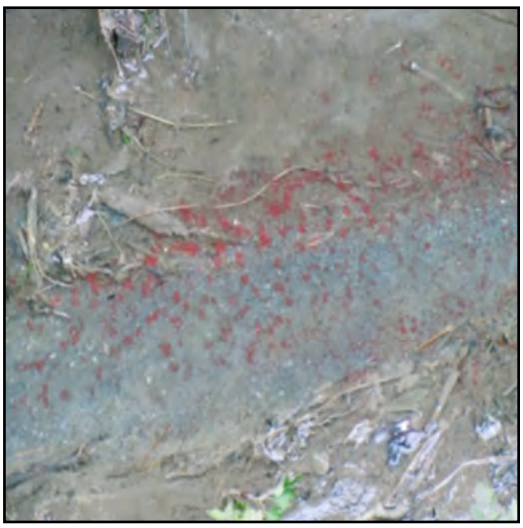


Photo 23 - Tubifex worm colonies show as red spots on the bed of waterways suffering from organic pollution such as farm effluents. Large numbers build up as they are resistant to such pollution, and will survive after other aquatic life has disappeared.

Photo 24 - A discoloured plume indicates potentially polluting matter entering a waterway. Plumes can be caused by slurry or yard run-off, or even soil erosion after heavy rainfall.

Photo 25 - Sewage fungus, the grey coating on the stones in the upper part of this picture, grows where water is polluted by organic matter such as slurry or silage effluent.

Photo 26 - Silage effluent will cause substantial growths of sewage fungus, as visible in the centre of this picture. Such growths grow quite quickly in the presence of a pollution source, but will die off rapidly when it is stopped.

Yards and livestock housing

Yards that produce slurry as run-off are typically areas that are frequently used, for example, livestock roaming areas and collecting yards.

Photo 27 - Run-off from a frequently used collecting yard is slurry.

Photo 28 - Run-off from a frequently used roaming yard is slurry.

Areas used infrequently by machinery or by livestock may produce dirty water. Where the level of contamination is severe, the run-off produced would be slurry until the area is cleaned for example, handling facilities and walkways. Depending on the level of cleaning, either dirty water or clean water may be produced.

Photo 29 - The removal of slurry from yard areas will reduce the requirement to store slurry.

The run-off from the unbrushed area would produce slurry. The brushed area would produce dirty water. Clean water could also be produced from these areas depending on the level of cleaning.

Photo 30 - Yard producing clean water.

Photo 31 - Poorly managed bedded livestock housing producing run-off which would be classed as slurry and must be collected and stored.

Silos

In unroofed silos the amount of silage, silage effluent and the silo cleanliness will dictate what type of run-off is produced.

Photo 32 - Run-off from an empty and cleaned silo would be clean water.

Photo 33 - Run-off from a well managed silo with minimal silage droppings and no effluent present, could produce dirty water. Otherwise, where effluent is present, it should be managed in the same way as slurry.

Annex C - The risk assessment to be completed if planning to spread fertiliser on steeply sloping land

If application of organic manure (including livestock manure) or chemical fertiliser to steeply sloping land (as defined in **Section 4.1.5-4.1.6**) is proposed, this risk assessment must be undertaken in addition to meeting all standard requirements of the NAP Regulations. The following factors must be considered in making this risk assessment:

- **Type and level of fertiliser being applied** - Particular care is needed in application of organic manures to steeply sloping land. High rates of application e.g. in excess of 25 m^3 of slurry per ha (2,250 gal per ac) represents high risk, moderate rates of application e.g. 15-25 m^3 of slurry per ha (1,350 gal per ac - 2,250 gal per ac) represents moderate risk and low rates of application <15 **m^3** of slurry per ha (1,350 gal per ac) represent low risk.
- **Time to incorporation of organic manures (land other than grassland only)** - The time interval between application and incorporation of organic manures should be determined. For solid organic manures, it should be considered high risk if there will be more than 5 days to incorporation, moderate risk if 3-5 days to incorporation and low risk if less than 3 days to incorporation. In the case of slurry, the time interval between application and incorporation should be assessed as high risk if there will be more than 48 hours to incorporation, moderate risk if 12-48 hours to incorporation and low risk if less than 12 hours to incorporation.
- **Proximity of waterway** - The distance from the area where spreading is planned to the nearest waterway at the bottom of the slope should be assessed. For organic manures, high risk is defined as less than 20 m from a waterway other than a lake, moderate risk is 20-30 m and low risk is more than 30 m. In the case of lakes, for organic manures, high risk is defined as less than 30 m from a lake, moderate risk is 30-40 m and low risk is more than 40 m. For chemical fertilisers, high risk is less than 5 m from any waterway, moderate risk is 5-10 m and low risk is more than 10 m).
- **Soil conditions** - The degree of soil wetness should be assessed. Very wet, compacted soil is assessed as high risk, moderate risk applies to wet, poached soils and low risk applies to dry, firm, trafficable soils.
- **Forecast weather conditions** - The Met Office is the UK's National Weather Service and provides forecasts for up to 5 days, at both a regional and local level. This information is available to the public through the internet at www.metoffice.gov.uk/ local press and media. Using Met Office information, forecast weather conditions should be assessed. Heavy rain (more than 4 mm per hour) forecast within 48 hours is assessed as high risk, moderate rainfall (0.5 - 4 mm per hour) within 48 hours is moderate risk and low rainfall (less than 0.5 mm per hour) within 48 hours is low risk.

Annex C - The risk assessment to be completed if planning to spread fertiliser on steeply sloping land

Using the table below to assess if a risk exists under each of the categories.

Table 6 - Risk assessment to be completed if spreading fertiliser on steeply sloping land

Factor	Risk level	Liquid organic manures	Solid organic manures	Chemical N fertiliser
Distance from spreading area to waterway other than lake	High	less than 20 m	less than 20 m	less than 5 m
	Medium	20-30 m	20-30 m	5-10 m
	Low	greater than 30 m	greater than 30 m	greater than 10 m
Distance from spreading area to lake	High	less than 30 m	less than 30 m	less than 10 m
	Medium	30-40 m	30-40 m	10-15 m
	Low	greater than 40 m	greater than 40 m	greater than 15 m
Amount of fertiliser applied	High	more than 25 m^3 per ha	more than 25 t per ha	greater than 120 kg N per ha
	Medium	15-25 m^3 per ha	15-25 t per ha	80-120 kg N per ha
	Low	less than 15 m^3 per ha	less than 15 t per ha	less than 80 kg N per ha
Soil conditions	High	very wet, compacted soil	very wet, compacted soil	very wet, compacted soil
	Medium	wet, poached soil	wet, poached soil	wet, poached soil
	Low	dry, firm trafficable soil	dry, firm trafficable soil	dry, firm trafficable soil
Forecast weather conditions for next 48 hours	High	heavy rainfall (more than 4 mm per hour)	heavy rainfall (more than 4 mm per hour)	heavy rainfall (more than 4 mm per hour)
	Medium	moderate rainfall (0.5-4 mm per hour)	moderate rainfall (0.5-4 mm per hour)	moderate rainfall (0.5-4 mm per hour)
	Low	low rainfall (less than 0.5 mm per hour)	low rainfall (less than 0.5 mm per hour)	low rainfall (less than 0.5 mm per hour)
Land other than grassland only - time to incorporation	High	more than 48 hrs	more than 5 days	n/a
	Medium	12-48 hrs	3-5 days	n/a
	Low	less than 12 hrs	less than 3 days	n/a

Annex C - The risk assessment to be completed if planning to spread fertiliser on steeply sloping land

As outlined in **Table 10** below, if one or more of the factors specified is assessed as “high risk”, application of chemical and/or organic fertilisers is prohibited. Similarly, if two or more of the factors specified are assessed as “medium risk”, application of chemical and/or organic fertilisers is prohibited.

Table 7 - Risk assessment determination for steeply sloping land

Level of risk		**Is spreading of chemical and/or organic fertilisers allowed?**
High risk	One or more of the categories	No
Medium risk	Two or more of the categories	No
	One category	Yes
Low risk	One or more of the categories	Yes

Table 8 - Risk assessment for fertiliser application to land other than steeply sloping land

Factor	Risk level	Organic Manures		Chemical Fertiliser	
		Grassland	Other land	Grassland	Other land
Slope percentage incline	High	20% or more (Use **Table 6**)	15% or more (Use **Table 6**)	20% or more (Use **Table 6**)	15% or more (Use **Table 6**)
	Medium	10 to less than 20%	10 to less than 15%	10 to less than 20%	10 to less than 15%
	Low	Less than 10%	Less than 10%	Less than 10%	Less than 10%
Distance from spreading area to waterway other than lakes	High	Less than 10 m		Less than 2 m	
	Medium	10 to 20 m		2 to 5 m	
	Low	More than 20 m		More than 5 m	
Distance from spreading area to lake	High	Less than 20 m		Less than 10 m	
	Medium	20 to 30 m		10 to 15 m	
	Low	More than 30 m		More than 15 m	
Amount applied per hectare per application	High	More than 50 m^3 (liquid) or 50 tonnes (solid)		More than 150 kg Nitrogen	
	Medium	25 to 50 m^3 (liquid) or 25 to 50 tonnes (solid)		120 to 150 kg Nitrogen	
	Low	Less than 25 m^3 (liquid) or 25 tonnes (solid)		Less than 120 kg Nitrogen	
Soil conditions at time of proposed slurry application	High	Very wet, compacted soil		Very wet, compacted soil	
	Medium	Wet, poached soil		Wet, poached soil	
	Low	Dry, firm trafficable soil		Dry, firm trafficable soil	
Forecast weather conditions for next 48 hours	High	Heavy rainfall (more than 4 mm per hour)		Heavy rainfall (more than 4 mm per hour)	
	Medium	Moderate rainfall (0.5 to 4 mm per hour)		Moderate rainfall (0.5 to 4 mm per hour)	
	Low	Low rainfall (less than 0.5 mm per hour)		Low rainfall (less than 0.5 mm per hour)	

Factor	Risk level	Organic Manures		Chemical Fertiliser
		Liquid	Solid	
Arable land only - time to incorporation	High	More than 48 hours	More than 5 days	Not applicable
	Medium	12 to 48 hours	3 to 5 days	Not applicable
	Low	Less than 12 hours	less than 3 days	Not applicable

Note : If slurry is to be applied using low emission slurry spreading equipment (LESSE) in a field with an incline of less than 10% towards a waterway or is less than 1 ha in size or less than 50 m in width, for risk level “high” substitute “medium”.

Table 9 - Risk Assessment Determination for land other than steeply sloping land

Risk level		Is spreading of chemical and/or organic fertiliser allowed?
High	One or more categories	No
Medium	Three or more categories	No
	One or two categories	Yes
Low	One or more categories	Yes

Annex D - Approximate eligible land requirements to meet 170 kg N per ha per year livestock manure nitrogen limit for various livestock types

Table 10 - Eligible land requirements to meet 170 kg N per ha per year livestock manure nitrogen limit for various livestock types

Livestock type	Eligible land requirement to meet 170 kg N per ha	
	Hectares	Acres
1 Dairy cow place (assuming a 30% replacement rate)*	0.69	1.7
1 Suckler cow place and calf place up to 1 year (assuming a 20% replacement rate)*	0.46	1.14
1 Cattle place 1-2 years	0.23	0.57
1 Cattle place over 2 years	0.26	0.64
1 Breeding ewe and lamb place up to 6 months (assuming a 20% replacement rate)*	0.06	0.15
1 Sow including gilt and boar contribution (assuming a 40% replacement rate and 22 pigs sold per sow per year)**	0.41	1.01
1,000 Laying hens	3.67	9.1
1,000 Broilers (actual number not places)	0.24	0.59
1,000 Broiler breeders (0-60 weeks)	1.64	4.05

* Land requirement will vary according to replacement rate
** Land requirement will vary according to replacement rate and performance

Examples: Land to meet 170 kg N limit

A 50 cow suckler herd with replacements up to one year requires 50 x 0.46 ha = 23 ha

100 dairy cow herd typically requires 100 x 0.69 ha = 69 ha

10,000 laying hen enterprise requires 10 x 3.7 ha = 37 ha

A 20,000 broiler house finishing 132,000 birds per year requires 132 x 0.24 ha = 32 ha

Annex E - Calculating how much livestock manure to import or export to meet the 170 kg N per ha per year limit

Table 11 - An example of how much livestock manure can be imported before the 170 kg N per ha per year limit is met

Total livestock manure N produced on farm	= 5,031 kg
Total eligible agricultural area controlled	= 46 ha
Total farm livestock manure N permitted to meet 170 kg N per ha per year limit = 46 x 170	= 7,820 kg
Amount of livestock manure N that can be imported = 7,820 kg - 5,031 kg	= 2,789 kg
Amount of cattle slurry 6% DM (containing 2.6 kg N/m^3) (**Annex G**) that can be imported = 2,789 kg ÷ 2.6 kg	= 1,073 m^3 (236,060 gal)
Amount of pig slurry 4% DM (containing 3.6 kg N/m^3) (**Annex G**) that can be imported = 2,789 kg ÷ 3.6 kg	= 775 m^3 (170,500 gal)
Amount of broiler litter (containing 33 kg N/ m^3) (**Annex G**) that can be imported = 2,789 kg ÷ 33 kg	= 84.5 t

Table 12 - An example of how much livestock manure can be exported before the 170 kg N per ha per year limit is met

Total livestock manure N produced on farm	= 5,031 kg
Total land controlled	= 20 ha
Total farm livestock manure N permitted to meet 170 kg N per ha per year limit = 20 x 170	= 3,400 kg
Amount of livestock manure N that needs to be exported is 5,031 kg - 3,400 kg	= 1,631 kg
Amount of cattle slurry 6% DM (containing 2.6 kg N/m^3) (**Annex G**) that must be exported = 1,631 kg ÷ 2.6 kg	= 627 m^3 or (138,940 gal)

Table 13 - Nitrogen excretion rates for livestock

Livestock type and age	N produced per head per year (kg N)
Cattle	
Dairy cows	100*
Dairy heifer (over 2 years)	45*
Dairy heifer (1-2 years)	39*
Beef suckler cow (over 2 years)	52*
Breeding bull	52*
Cattle (over 2 years)	45*
Cattle (1-2 years)	39*
Bull beef (0-13 months)	30
Bull beef (6-13 months)	23
Calf (0-1 year)	19
Calf (0-6 months)	7
Calf (6-12 months)	12
***use these figures from 1 January 2020**	
Sheep	
Ewe (over 1 year)	9
Ram (over 1 year)	9
Lamb (0-6 months)	1.2
Lamb (6-12 months)	3.2
Lamb (0-1 year)	4.4
Deer	
Deer (red) (6 months - 2 years)	12
Deer (red) (over 2 years)	15
Deer (fallow) (6 months - 2 years)	7
Deer (fallow) (over 2 years)	13
Deer (sika) (6 months - 2 years)	6
Deer (sika) (over 2 years)	10
Goats	
Milking goats	15
Non-milking goats	9
Kid (0 - 1 year)	4.4
Kid (6 - 12 months)	3.2
Kid (0 - 6 months)	1.2

Livestock type and age		N produced per head per year (kg N)	
Horses			
Horse (over 3 years)		50	
Horse (2 - 3 years)		44	
Horse (1 - 2 years)		36	
Horse (under 1 year)		25	
Donkey/small pony		30	
Pigs			
Boars		18	
Maiden gilt		11	
Breeding sow (includes served gilts, dry and lactating sows and piglets to weaning)		16	
	Approximate sale weight	**N produced per pig (kg N)**	
Weaned at 3 - 4 weeks	18 kg (7½ weeks)	0.09	
	35 kg (11 weeks)	0.38	
	105 kg (23 weeks)	2.38	
Growing and finishing pigs	7 kg - 105 kg	2.38	
	18 kg - 35 kg	0.29	
	18 kg - 105 kg	2.30	
	35 kg - 105 kg	2.00	
Poultry		**N produced per 1,000 birds per crop (kg N)**	**Quantity of litter produced tonne per 1,000 birds**
Broilers Conventional (1,000's)		40	1.2
Broilers Hot Water Heating System (6 week crop) (1,000's)		33.8	1.0
Free Range Broilers (8 week crop) (1,000's)*		44.9	1.79
Turkeys (0-6 weeks) (1,000's)*		229	9.2
Turkeys (6 weeks–kill) (1,000's)		305	12.3
Turkeys (0–kill) (1,000's)		534	21.5
Fattening ducks (1,000's)		139	

Annex F - Nitrogen excretion rates for livestock

Livestock type and age	N produced per head per year (kg N)	
Poultry	**N produced per 1,000 birds per week**	**Quantity of litter produced tonne per 1,000 birds**
Broiler breeders (1,000s) (0-18 weeks)	2.9	3.0
Broiler breeders (1,000s) (18-60 weeks)	7.2	14.7
Broiler breeders (1,000s) (0-60 weeks)	5.9	17.7
Pullets (1,000s)	4.7	2.3
Layers (1,000s)*	12	45
Free Range Laying Hens (1,000's)	5.4	17.3

* Values may change if further research into poultry manure nutrient content is carried out.

Table 14 - Nitrogen (N) and phosphate (P_2O_5) content, proportion of total phosphorus to total nitrogen and phosphate availability values for organic manures (all on a fresh weight basis)

Manure type	Dry matter content (%)	Total N	Available N	Total P_2O_5	Available P_2O_5 at Soil P Index 0-1 and for all potato and vegetable crops	Available P_2O_5 at Soil P Index 2 or greater, except for potato and vegetable crops	Proportion of total P to total N
Liquid manures/ slurries		**(kg per m^3)**	**(kg per m^3)**	**(kg per m^3)**	**(kg per m^3)**	**(kg per m^3)**	
Cattle slurry (figures in bold are most common values)	2	1.6	0.64	0.6	0.3	0.6	0.16
	6	**2.6**	**1.0**	**1.2**	**0.6**	**1.2**	**0.20**
	10	3.6	1.4	1.8	0.9	1.8	0.22
Pig slurry (figures in bold are most common values)	2	3.0	1.5	0.8	0.4	0.8	0.12
	4	**3.6**	**1.8**	**1.5**	**0.75**	**1.5**	**0.18**
	6	4.4	2.2	2.2	1.1	2.2	0.22
Separated cattle slurry (liquid portion) - strainer box	1.5	1.5	0.6	0.3	0.15	0.3	0.09
Separated cattle slurry (liquid portion) - weeping wall	3	2	0.8	0.5	0.25	0.5	0.11
Separated cattle slurry (liquid portion) - mechanical separator	4	3	1.2	1.2	0.60	1.2	0.17
Separated pig slurry (liquid portion)	3	3.6	1.8	1.1	0.55	1.1	0.13
Dirty water	0.5	0.5	0.2	0.1	0.05	0.1	0.08

Annex G - Nutrient value of livestock manures

Manure type	Dry matter content (%)	Total N	Available N	Total P_2O_5	Available P_2O_5 at Soil P Index 0-1 and for all potato and vegetable crops	Available P_2O_5 at Soil P Index 2 or greater, except for potato and vegetable crops	Proportion of total P to total N
Solid manures		**(kg/t)**	**(kg/t)**	**(kg/t)**	**(kg/t)**	**(kg/t)**	
Cattle FYM	25	6.0	1.8	3.2	1.9	3.2	0.23
Sheep FYM	25	7.0	2.1	3.2	1.9	3.2	0.20
Goat manure	40	9.5	2.9	4.5	2.7	4.5	0.21
Pig FYM	25	7.0	2.1	6.0	3.6	6.0	0.37
Horse manure	25	5.0	2.2	5.0	3.0	5.0	0.44
Broiler litter conventional	66	33	9.9	16	9.6	16	0.21
Broiler litter hot water heating	72	33.8	10.1	16.1	9.7	16.1	0.21
Free Range broiler litter*	57	26.4	7.9	15.4	9.2	15.4	0.25
Broiler breeder manure 0-18 weeks	55	17.5	5.3	27.1	16.3	27.1	0.67
Broiler breeder manure 18-60 weeks	60	20.7	6.2	25.3	15.2	25.3	0.53
Broiler breeder manure 0-60 weeks	59	20.2	6.1	25.6	15.3	25.6	0.56
Pullet	72	32.7	9.8	27.6	16.6	27.6	0.37
Layer manure*	30	16	4.8	13	7.8	13	0.36
Free Range laying hens	46	18.8	5.6	17.3	10.4	17.3	0.40
Turkey litter 0-6 weeks*	58	24.8	7.4	13.7	8.2	13.7	0.24
Turkey litter 6 weeks-kill	58	24.8	7.4	13.7	8.2	13.7	0.24

Manure type	Dry matter content (%)	Total N	Available N	Total P_2O_5	Available P_2O_5 at Soil P Index 0-1 and for all potato and vegetable crops	Available P_2O_5 at Soil P Index 2 or greater, except for potato and vegetable crops	Proportion of total P to total N
Solid manures		**(kg/t)**	**(kg/t)**	**(kg/t)**	**(kg/t)**	**(kg/t)**	
Turkey litter 0-kill	58	24.8	7.4	13.7	8.2	13.7	0.24
Duck manure*	25	6.5	2.0	5.5	3.3	5.5	0.37
Spent mushroom compost	35	8.0	1.6	3.4	1.7	3.4	0.19
Separated cattle slurry (solid portion)	20	4.0	1.2	2.0	1.0	2.0	0.22
Separated pig slurry (solid portion)	20	5.0	1.5	3.7	1.2	3.7	0.32
Other organic manures	As per analysis	As per analysis	40% of total	As per analysis	60% available	100% available	As per analysis

* Values may change if further research into poultry manure nutrient content is carried out.

Notes:

The limits in **Tables 15-16** take account of all types of nitrogen fertiliser including all organic manures (including livestock manures) and chemical nitrogen fertiliser.

For arable and forage crops, in situations where the soil type is uncertain, the following guidance may be used to assess the maximum crop nitrogen requirement. This guidance has been derived from the latest edition of the AHDB Nutrient Management Guide (RB209) and takes into account the most common soil types in Northern Ireland.

In order to establish the chemical nitrogen fertiliser crop requirement, three steps need to be followed:

1. Establish the SNS index from **Table 15 or 16** below. In most circumstances this will be SNS 1, unless the previous crop was vegetables or grass with a high nitrogen application.
2. Determine crop nitrogen requirement from **Table 15 or 16** below.
3. Remember if organic manures, including livestock manures, are to be applied to the crop area, the nitrogen available from these manures (**Annex G**) must be subtracted from the maximum nitrogen application rate for chemical fertiliser.

In Tables 15 and 16:

- Low residual nitrogen vegetables ('Low N vegetables') are crops such as carrots, onions, radish, swedes or turnips where the amount of crop residue is relatively small.
- High N grassland means average annual applications of more than 250 kg N per ha in fertiliser plus available N in manure used in the last two years, or clover-rich swards or lucerne.
- Low N grassland means average annual inputs of less than 250 kg N per ha in fertiliser plus available nitrogen in manure used in the last two years, or swards with little clover.

Annex H - Fertiliser standards for nitrogen applications for arable and forage crops

Table 15 - Maximum nitrogen fertiliser application limits (kg N per ha) for arable and forage crops

Crop	Previous crop		
	Cereals; sugar beet; peas; beans; oilseed rape; potatoes; Low/Medium N vegetables; forage crops (cut); uncropped land; all leys with 2 or more cuts annually receiving little or no manure; 1-2 year leys, Low N; 1-2 year leys, 1 or more cuts; 3-5 year leys, Low N, 1 or more cuts.	High N vegetables; 1-2 year leys, High N, grazed; 3-5 year leys, low N, grazed; 3-5 year leys, High N, 1 cut then grazed.	3-5 year leys, High N, grazed
	SNS 1	**SNS 2**	**SNS 3**
Winter wheat, winter triticale*	220	190	160
Winter barley	170	140	110
Winter oats	160	130	100
Winter rye	120	90	60
Spring wheat	180	150	120
Spring barley	140	110	70
Spring oats, spring rye, triticale	110	70	40
Winter oilseed rape	190 (+30 seedbed)	160 (+30 seedbed)	120
Spring oilseed rape	120	80	50
Spring linseed	80	50	0-40
Forage maize	100	50	20
Peas (dried & vining) and beans	0	0	0
Sugar beet	120	100	80
Forage swedes and turnips (65 t per ha roots removed)	80	60	40
Fodder beet (85 t per ha roots removed)	120	110	90
Forage rape, swedes and stubble turnips (grazed)	80	60	40
Kale (grazed)	120	110	90

*Winter forage triticale is generally harvested earlier than winter triticale grown for grain. Nitrogen recommendations are therefore 50 kg N/ha lower than for winter triticale grown for grain. Nitrogen requirements for all other wholecrop cereals are the same as those for cereals grown for grain.

Table 16 - Maximum nitrogen fertiliser application limits (kg N per ha) for potatoes

		Previous crop	
Length of growing season (50% emergence to haulm death)	**Variety group***	Cereals; sugar beet; peas; beans; oilseed rape; potatoes; Low/Medium N vegetables; forage crops (cut); uncropped land; all leys with 2 or more cuts annually receiving little or no manure; 1-2 year leys, Low N; 1-2 year leys, 1 or more cuts; 3-5 year leys, Low N, 1 or more cuts	High N vegetables; 1-2 year leys, High N, grazed; 3-5 year leys, low N, grazed; 3-5 year leys, High N, 1 cut then grazed; 3-5 year leys, High N, grazed
		SNS 1	**SNS 2 and 3**
<60 days	Variety group 1	140	110
	Variety group 2	120	80
	Variety group 3	100	70
60 - 90 days	Variety group 1	210	160
	Variety group 2	160	120
	Variety group 3	140	100
	Variety group 4	80	40
90 - 120 days	Variety group 1	270	220
	Variety group 2	220	160
	Variety group 3	180	100
	Variety group 4	140	60
>120 days	Variety group 2	250	180
	Variety group 3	210	140
	Variety group 4	180	80

***Examples of varieties in each variety group are as follows:**

Group 1	Short haulm longevity (Determinate varieties)	Accord, Annabelle, Anya, Colmo, Estima, Inovator, Maris Bard, Minerva, Premiere, Rocket, Vales Emerald and Winston.
Group 2	Medium haulm longevity (Partially determinate varieties)	Atlantic, Amanda, Arcade, Carlingford, Charlotte, Courage, Dundrod, Endeavour, Harmony, Juliette, Kestrel, Lady Claire, Lady Rosetta, Marfona, Maris Peer, Maritiema, Melody, Miranda, Mozart, Nadine, Nicola, Orchestra, Orlan, Osprey, Pentland Javelin, Rembrandt, Romano, Saxon, Shannon, Shepody, Vivaldi and Wilja.
Group 3	Long haulm longevity (Indeterminate varieties)	Maincrop varieties such a Agria, Ambo, Amora, Cabaret, Ceasar, Cosmos, Cultra, Daisy, Desiree, Eos, Fambo, Fianna, Hermes, Kerr's Pinks, King Edward, Lady Christi, Lady Valora, Maris Piper, Morene, Navan, Pentland Dell, Pentland Squire, Picasso, Record, Rooster, Russet Burbank, Sante,Sassy, Saturna, Slaney, Stemster, Valor and Victoria.
Group 4	Very long haulm longevity	Asterix, Cara, Lady Balfour, Markies, Royal, Vales Everest, Vales Sovereign.

Annex I - N-Max limits for cereals

Note:

The limits below take account of all types of nitrogen fertiliser including all organic manures (including livestock manures) and chemical nitrogen fertiliser.

Table 17 - Maximum permitted nitrogen application and standard yields for cereal crops

Crop type	Maximum permitted N (kg N per ha)*	Standard yield (t per ha)**
Winter wheat	220	8.0
Spring wheat	180	6.0
Winter barley	170	6.5
Spring barley	140	5.5
Winter oats	140	6.0
Spring oats	110	6.0

* For all crops in the table, an additional 20 kg N per ha is permitted for every tonne that the expected yield exceeds the standard yield. Evidence of this must be demonstrated by overall farm crop yield in any of the previous three years.

** Standard yield (t per ha) as per AHDB Nutrient Management Guide RB209 (Feb 2020 edition).

Note:

The limits below take account of all types of phosphate fertiliser including all organic manures (including livestock manures) and chemical phosphate fertiliser.

These maximum limits must be complied with if chemical phosphate fertiliser, P-rich manures or anaerobic digestate are being applied. However, in any case, the values in **Tables 20 and 21** are the current phosphate recommendations for Northern Ireland growing conditions.

The classification of soil analysis results into soil P indices (from Olsen extractable phosphorus concentration in soil) is shown in **Table 21**.

Table 18 - Maximum phosphate fertiliser application limits (kg P_2O_5 per ha) for arable and forage crops

	Soil P Index				
	0	**1**	**2***	**3**	**4**
Cereals - straw ploughed in/incorporated					
- Winter wheat, winter barley	110	80	50	0	0
- Winter triticale	125	95	65	0	0
- Spring barley	105	75	45	0	0
- Spring wheat, spring triticale, Winter and Spring oats and rye	110	80	50	0	0
Cereals - straw removed					
- Winter wheat, winter barley	115	85	55	0	0
- Winter triticale	130	100	70	0	0
- Spring barley	105	75	45	0	0
- Spring wheat, spring triticale, rye,	110	80	50	0	0
- Winter and spring oats	115	85	55	0	0
Other crops					
Winter oilseed rape	110	80	50	0	0
Spring oilseed rape, linseed	90	60	30	0	0
Wholecrop cereals**	115	85	55	0	0
Peas (dried & vining) and beans	100	70	40	0	0
Sugar beet	110	80	50	0	0
Forage Maize	115	85	55	20	0
Forage swedes and turnips (roots lifted)	105	75	45	0	0

* Phosphate limits/recommendations for arable crops have not been split into soil P index 2- and 2+; they remains as just 2. Even if soil analysis results are in the form of P index 2- and 2+, the recommendations in Table 18 for Index 2 should be used for arable crops.

** Wholecrop cereals includes wholecrop wheat, barley, oats, rye & triticale winter sown and wholecrop wheat, barley, oats & rye spring sown.

Other crops					
Fodder beet (roots lifted)	120	90	60	0	0
Forage rape, swedes and stubble turnips (grazed)	85	55	25	0	0
Kale (grazed)	80	50	20	0	0
Maincrop potatoes	250	210	170	100	0
Early seed potatoes	250	210	170	100	0

Table 19 - Maximum phosphate fertiliser application limits (kg P_2O_5 per ha) for grassland

	Soil Index					
	0	1	2-	2+	3	4
Grass establishment	120	80	65	50	30	0
Grazed grass (whole season)	80	50	35	20	0	0
First cut silage	100	70	55	40	20	0
Second cut silage	25	25	25	25	0	0
Third cut silage	15	15	15	15	0	0
Fourth cut silage	10	10	10	10	0	0
Hay	80	55	43	30	0	0

Notes:

These maximum limits must be complied with if grassland is extensively managed, where the whole grassland area receives under 60 kg chemical N per ha per year or the N loading is under 120 kg manure N per ha per year

If silage or hay crops within an extensively managed grassland farm receive over 80kg chemical N per ha per year use the maximum limits for silage and hay in **Table 19** above.

Table 20 - Maximum phosphate fertiliser application limits (kg P_2O_5 per ha) for extensively managed grassland

	Soil Index					
	0	1	2-	2+	3	4
Grass establishment	80	65	50	30	0	**0**
Grazed grass (whole season)	50	35	20	0	0	**0**
First cut silage	70	55	40	0	0	**0**
Hay	55	43	30	0	0	**0**

Table 21 - Classification of soil analysis results into soil phosphorus (P) indices

Soil P index	Olsen extractable phosphorus (P) (mg P/l)
0	0-9
1	10-15
2-	16-20
2+	21-25
3	26-45
4	46-70

Table 22 - Space allowance for bedded livestock*

	Mass of animal (kg)	Bedded area (m^2)	Loafing/ feeding area (m^2)	Total area per head (m^2)
Cattle				
Dairy cattle	200	2.0	1.0	**3.0**
	300	2.8	1.2	**4.0**
	400	3.5	1.4	**4.9**
	500	4.3	1.6	**5.9**
	600	5.0	1.8	**6.8**
	700	5.8	2.0	**7.8**
Beef cattle	200	2.0	1.0	**3.0**
	300	2.4	1.0	**3.4**
	400	2.6	1.2	**3.8**
	500	3.0	1.2	**4.2**
	600	3.4	1.2	**4.6**
	700	3.6	1.4	**5.0**
Loose housed calves	Up to 60	-	-	**1.1**
	85	-	-	**1.8**
	140	-	-	**2.4**
Sheep				
Pregnant ewes	Grouped 68 kg	-	-	**1.2**
	Grouped 90 kg	-	-	**1.4**
Ewes with lambs	Individually penned	-	-	**2.2**
	Groups 68 kg	-	-	**1.7**
	Grouped 90 kg	-	-	**1.8**
Lambs	Groups	-	-	**1.5**
	Creep area at 2 weeks	-	-	**0.15**
	23 kg	-	-	**0.6**
	32 kg	-	-	**0.8**

*From BS 5502 Part 40 “The Design of Livestock Holdings”.

Part 1

Registered Owner: _____

Address: _____

Location address of storage facility (if different from above)

_____

_____

Type of storage facilities:	Below ground tank	
	Above ground tank	
	Other (for example, midden) (please specify)	

Enter details of storage capacity in Tables in **Part 3**.

Part 2 Rental Agreement and Undertaking

I,_____, hereby certify that the above storage facilities are rented to:

Name of tenant:_____

Address of tenant: _____

_____

for the period _____ to _____

Signature of owner: _____

Name in BLOCK LETTERS: _____ Date: _____

I, _____ , undertake to ensure that I have sufficient storage capacity available for stock numbers to comply with the storage requirement of the Nutrient Action Programme Regulations (Northern Ireland) 2019 in the event of the above storage facility not being available to me beyond the dates stated above.

Signature of Tenant: _____

Name in BLOCK LETTERS: _____ Date: _____

Part 3

Table A - Storage capacity of rectangular tanks and lagoons

Tank	**Description**	**Length (l) (m)**	**Breadth** (b) (m)	**Adjusted depth (d)** (Depth - freeboard*) (m)	**Volume of facilities** (l x b x d) (m^3)
1					
2					
3					
4					
5					
6					
Total capacity of rectangular tanks and lagoons					**m^3**

Table B - Storage capacity of above ground circular stores

Tank	**Description**	**Radius** (rad) (m)	**Adjusted height h** (m) (Height - freeboard*)	**Volume of facilities** (3.14 x rad x rad x h)(m^3)
1				
2				
3				
4				
5				
6				
Total capacity of rectangular tanks and lagoons				**m^3**

* Freeboard is the term given to the unfilled depth (safety margin) at the top of a slurry tank or compound. Mandatory freeboard allowances are at least 750 mm for earth bank lagoons and 300 mm for all other slurry stores. This is not a legal requirement for facilities completed before 1 December 2003 (unless they have been substantially modified). However, it is considered best management practice to adhere to free- board allowances in all stores.

Annex M - Example of contractual agreement with processing facilities to export livestock manure for storage allowance

Recipient Name: _____

Address: _____

_____

Agreement for the period _____ to _____

Type of livestock manure: _____

Amount of livestock manure:_____

Exporter

I, _____, certify that the above livestock manure type and quantity is/was exported in the agreed period to the above recipient.

Signed: _____

Dated: _____

Recipient

I, _____, certify that the above livestock manure type and quantity is/was imported in the agreed period from the above exporter.

Signed: _____

Dated: _____

Table 23 - Example of a record of exported/imported organic manures to be kept on farm

A record of all manure exports must be submitted using DAERA online services, available at www.daera-ni.gov.uk/onlineservices by 31 January for the previous calendar year. You will also need to keep a copy of the record on the farm as it may be required during an inspection.

Required			Optional(2)		Required		
Date moved	**Type of livestock manure**	**Quantity (tonnes or m³)(1)**	**Nitrogen content of manure kg/m³ or kg/t (see Annex G)**	**Total nitrogen kg (AxB)**	**Exporter's name and Business ID**	**Transporter's name and address**	**Importer's name and Business ID(3)**
		(A)	**(B)**	**(AxB)**			
14/9/19	Pig slurry	50	3.6	180	Robert Jones Bus ID 456789	John Smith 1 Farmview Rd Ballyhome, BT90 1XY	John Smith Bus ID 123456
20/9/19	Anaerobic digestate	50	4.5	225	Robert Jones Bus ID 45678	John Smith 1 Farmview Rd Ballyhome, BT90 1XY	John Smith Bus ID 123456

(1) (m³ = 220 gallons).

(2) There is no requirement to enter this data or make this calculation, but it may help you assess your nitrogen loading status.

(3) For exports to RoI, importer's Herd No. should be included instead of Business ID.

Notes:

- Under the NAP Regulations and Cross-Compliance it is an offence to provide false or misleading information and penalties can apply, i.e., a fine under NAP or reduced Area-Based Scheme payments under Cross-Compliance.
- Any total nitrogen (kg) exported should be subtracted from the total nitrogen excretion value for the livestock manure nitrogen loading calculation. Any total nitrogen (kg) imported should be added to the total nitrogen excretion value for the livestock manure nitrogen loading calculation.
- For organic manures other than livestock manure (for example, anaerobic digestate), it is normally the producer's responsibility to provide the user with a nutrient analysis, so that they can calculate nutrient loadings. However, this depends on the type of manure and the rules controlling its use. If you are exporting organic manures other than livestock manures (for example, sewage sludge or anaerobic digestate), contact NIEA to discuss whether you are required to provide a nutrient analysis and at what frequency.

Annex O - Example of records required for fertiliser details

Opening stocks of chemical fertilisers 1 January 2019

Fertiliser type, for example, 25:5:5	Quantity (tonnes)
25:5:5	1.6

Chemical fertilisers (purchased/imported and sold/exported)

Date	NPK Content	Amount purchased or imported onto farm in tonnes	Amount sold or exported off farm in tonnes
9/2/2019	27:0:0	26.5	
11/3/2019	46:0:0	2.4	
12/3/2019	24:6:12	0.8	
15/3/2019	0:18:28	0.3	
1/4/2019	25:5:5	1.6	

Closing stocks of chemical fertilisers 31 December 2019

Fertiliser type, for example, 25:5:5	Quantity (tonnes)
27:0:0	1

Annex P - Cross border movement of manure/slurry between Northern Ireland and the Republic of Ireland

Imports and exports of livestock manure (including poultry litter and slurry) between Northern Ireland and the ROI are regulated by animal by-product (ABP) legislation[6]. The procedures that must be followed are summarised below. Further information on the requirements relating to cross border movements of livestock manure can be found https://www.daera-ni.gov.uk/services/animal-products-animal-by-products-exports

Importing livestock manure from the ROI

If you want to import livestock manure from the ROI, the exporting farm in the ROI will need to complete an application form for authorisation to export to Northern Ireland. Application forms are available from the Milk & Meat Hygiene/ABP Division of the DAFM or downloaded from their website (see contact details below).

The completed form should be sent to DAERA Veterinary Service Trade Section at:

Veterinary Service, DAERA
Trade Section
Ballykelly House
111 Ballykelly Road
Ballykelly, Limavady
BT49 9HP

Telephone: 028 9052 0832 for Northern Ireland
Email: tradeadminpost@daera–ni.gov.uk
Website: www.daera-ni.gov.uk/services/animal-products-animal-by-products-exports

A copy of the form should also be sent to DAFM at:

Milk & Meat Hygiene/ABP Division
Department of Agriculture,
Food and Marine
Grattan House
Grattan Business Centre
Portlaoise, Ireland

Telephone: 00353 578694345
Email: mary.scully@agriculture.gov.ie
Website: www.agriculture.gov.ie/agri-foodindustry/animalbyproducts/tradeinanimalby-productsunderarticle48ofregulation10692009/

As you are the importing farm, you also need an import licence. The application form (IL23 ABP) for this can be obtained from DAERA Veterinary Service Trade Section or downloaded from their website (see contact details above). On receipt of both forms (from the

Northern Ireland importer and the ROI exporter) DAERA will process the paperwork and, if successful, issue the appropriate licence/authorisation to you. DAERA will also advise DAFM that a licence has been issued.

The exporting farm in the ROI must advise their local Regional Veterinary Office (RVO) of the export so as the movement can be recorded, if required, on the Trade Control and Expert System (TRACES) database.

In addition to the above requirements, a health certificate (signed by a Veterinary Officer of DAFM in the ROI) will be required to accompany the consignment to Northern Ireland. You must present the certificate to your local DAERA Office in Northern Ireland within 48 hours of arrival (see **Annex V** for list of DAERA offices).

6 EU Regulation 1069/2009 and related DAERA Regulations.

Annex P - Cross border movement of manure/slurry between Northern Ireland and the Republic of Ireland

Note: The livestock manure must be applied directly to land at the farm of destination stated on the licence/authorisation and applications must comply with the NAP closed periods and other spreading restrictions (see **Sections 3 and 4** of this guidance booklet).

Exporting livestock manure to the ROI

If you are exporting livestock manure to the ROI you need to complete an application form for authorisation to export. Application forms are available from DAERA Veterinary Service Trade Section or downloaded from their website. The completed form should be sent to DAFM. Consignments of livestock manure also need to be accompanied by an export health certificate.

There are three certificates for this trade:

- Poultry manure/litter.
- Porcine manure/slurry.
- Bovine manure/slurry.

Please apply to your local DAERA Direct office for the relevant health certificate using the application form TRACES EXA NI which can be downloaded from: www.daera-ni.gov.uk/services/animal-products-animal-by-products-exports

The health certificate should be completed by your Authorised Veterinary Inspector (AVI). The receiving farm must inform their DAFM RVO within one working day of the arrival of each consignment.

Following completion of the health certificate, please ensure your AVI forwards a copy to your local DAERA Office to allow them to advise DAFM of the export via the TRACES system. AVIs should retain copies of certificates for at least two years.

Transporting livestock manure

Consignments of manure must be transported in compliance with ABP Regulations and transported by a registered haulier.

Applications for registration are available from the DAERA website: www.daera-ni.gov.uk/publications/registration-abp-operators-establishments-or-plants

For further information on registration and approval please telephone 028 77442298 or send an email to: applications.aiabp@daera-ni.gov.uk

Please note the above processes may change depending on the UK exit from the EU so you are advised to check the DAERA website for the most up to date protocol.

Annex Q - Standards for slurry and silage storage

The notes below on construction, management and maintenance standards for slurry, silage and silage effluent storage are summarised from the "Guidance Notes for the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) (SSAFO) Regulations (Northern Ireland) 2003" which are available on the NIEA website at: www.daera-ni.gov.uk/articles/silage-slurry-and-agricultural-fuel-oil-ssafo-storage

Measures relating to slurry, silage and silage effluent have now been transferred from the SSAFO Regulations to the NAP Regulations, but the document remains valid (other than the specification for the amount of slurry storage capacity required, which is superseded by the capacity required in the NAP Regulations). The guidance notes provide further detail on requirements and application of the measures and on certain exemptions.

A. General requirements

The Regulations require all new, substantially enlarged and substantially reconstructed silage and slurry stores to be constructed with a life span of at least 20 years. This means that the installation, with proper maintenance, is expected to meet the requirements of the Regulations for at least 20 years without causing, or being at risk of causing, pollution.

New underground storage facilities must be situated at least 10 m from any waterway. All new above ground slurry stores constructed from 1 January 2020 must be sited at least 50 m from any waterway, in addition all new slurry tanks (excluding lagoons) must be fitted with a cover. If you are building or enlarging storage and think you may be affected by this, you should contact NIEA **at the planning stage** to discuss siting of the store.

NIEA must be given at least 28 days notification about any new, or substantially enlarged or reconstructed slurry and silage storage and silage effluent tanks before they are brought into use for the first time. In most situations this form needs to be signed by a chartered engineer to confirm the storage complies with the standards in the Regulations. A copy of the notification form is available at www.daera-ni.gov.uk/publications/nutrient-action-programme-nap-notification-form

B. Slurry storage

All *slurry storage systems* where construction, substantial enlargement or substantial reconstruction was completed after 1 December 2003, must be built in accordance with the specifications set out below:

- The base and walls (unless a 'weeping wall' design) of slurry storage tanks, the base and walls of any effluent tanks, channels and reception pits, and the walls of any pipes must be impermeable, be protected against corrosion and capable of withstanding loadings as calculated as specified in British Standard BS 5502-50:1993+A2:2010.
- For above ground, weeping-wall stores (where the walls of the store are designed to be permeable), the base must extend beyond the walls and be provided with impermeable channels to collect any escaped slurry and drain it to an effluent tank.

- The banks (walls) and floors of controlled earth banked slurry lagoons must either be lined with an impermeable membrane, or else a laboratory or hydro-geological engineer's report should certify that the permeability of the soil is less than 10-9 m/sec (to a depth of 1 m), for satisfactory impermeability without a liner. The soil must also be suitable for forming stable embankments designed to meet loadings as calculated in British Standard BS 5502-50:1993+A2:2010. There are also health and safety considerations; for example, a stock and child-proof fence must be provided with all access points adequately secured.
- Circular steel slurry tanks should be designed and constructed, as specified in British Standard BS 5502-50:1993+A2:2010, to be impermeable, resistant to corrosion and capable of withstanding loadings, as calculated in the manner set out in the standard.
- Outlet drainage pipes on slurry stores must have two valves in series, each capable of shutting off the flow of slurry and each kept locked shut when not in use. Valves should be at least 1 m apart. Other drainage pipes connecting slurry storage tanks do not need to have valves if they drain into another tank which is as large as, or larger, than the first, or where the tops of tanks are at the same level.
- Controlled structures are required to maintain a minimum freeboard of 750 mm for earth-banked compounds (whether lined or not) and 300 mm in all other cases. The level of slurry in all structures should be checked regularly and arrangements made for the safe disposal of slurry before the tank is full. Particular care must be taken to ensure that lagoons or stores do not overflow.
- Calculation of the minimum size required for any slurry holding structure must include provision for the likely quantities of rainwater falling directly on to the store and on areas which drain into the store. It must also allow for the maintenance of freeboard.

Middens and washings from houses

Run-off from middens associated with a farmyard is defined as slurry and must be collected and stored in appropriate facilities, either independently or in the main slurry storage system. Similarly, washings from houses containing manure or poultry litter are considered slurry and must be collected and stored in appropriate facilities, either independently or in the main slurry storage system.

C. Silage storage and silage effluent tanks

All silage storage and silage effluent tanks where construction, substantial enlargement or substantial reconstruction was completed after 1 December 2003 must be built in accordance with the specifications set out below:

Silos

- The base of the silo, where the silo has retaining walls other than earth, must extend beyond those walls and be constructed to have a load bearing capacity at least equal to the maximum loading that will be placed on it. In all cases the base of the silo must be provided with channels constructed to collect all silage effluent and convey it to a suitably constructed effluent tank, otherwise the base may crack and lose its structural integrity and impermeability.
- Silo walls must be resistant, so far as is practicable, to corrosion by silage and silage effluent and must be capable of withstanding the minimum loading calculated on the assumptions and in the manner indicated in the current British Standard BS 5502-22:2003+A1:2013. A notice displaying the loading capabilities must be displayed on the retaining walls. The maximum load specified must not be exceeded.
- Where a silo has earth bank walls, or is cut into a hillside, the walls must be lined with an impermeable membrane. The liner must be carried over the edge of the floor onto the concrete floor slab, so as to prevent any seepage of effluent into the earth banks. It is acceptable to place perforated piping on top of the impermeable membrane, or within impermeable transfer channels, in order to aid drainage of silage effluent to an effluent tank. The construction of earth banked silos must ensure that the structure remains impermeable for at least 20 years.
- Baled silage refers to that silage wrapped or made in sealed, impermeable plastic membranes or bags. It is not necessary to store baled silage on a specially constructed base but it is recommended that the farmer should choose a level site and make a careful assessment of the potential polluting risk to a waterway.
- The making and storage of silage in a field clamp without a constructed impermeable base and effluent containment system **is prohibited** by the Regulations.

Silage effluent tanks

- The base and walls of the effluent tank must be impermeable and resistant, so far as reasonably practicable, to corrosion by silage effluent. In order to protect concrete tanks from attack by silage effluent, it is recommended that they be lined with an appropriate product. Linings should be checked at regular intervals and repaired/ renewed as necessary. **H&S issues must be considered before any inspection is carried out.** If the base of the tank is below ground, the tank must be designed and constructed to meet the current British Standard BS 5502: Part 50: 1993.

- In some instances farmers may wish to store silage effluent and slurry in the same tank. If this method of storage is used then the storage container must be designed and constructed to withstand both types of neat effluent.
- Effluent collection systems to collect all silage effluent produced are required in **all** circumstances. They must convey all silage effluent in all its forms to a collection and containment facility. Collection systems, for controlled structures, are **not permitted** to be fitted, at any time, with overflow or diverter/by-pass facilities connected to a storm drain or waterway. Earth sumps and soakaways are **not permitted** for use in connection with a controlled silo because of the risk of groundwater pollution.
- All channels, drains and pipes connected to the silo must be impermeable and resistant, so far as reasonably practicable, to corrosion by silage and silage effluent.
- Effluent tanks for silos with a capacity of less than 1500 m^3 should have a quantity of not less than 3 m^3 for each 150 m^3 silo capacity. Effluent tanks for silos with a capacity of 1,500 m^3 or greater should have a quantity of not less than 30 m^3 plus 1 m^3 for every 150 m^3 silo capacity in excess of 1,500 m^3.

Annex R - Manure heaps and fire safety

To minimise the risk of fires occasionally occurring in both uncovered and covered manure field heaps and middens (including poultry litter in field heaps and middens), the following guidance should be followed.

For both farmyard manure and poultry litter:

- Meet with your local fire service, and discuss the organic material that may be stored and guidelines to handle any fires if they occur (note that use of water on manure fires may not be the best first step).
- Have an agreement with the fire service about when to call them, e.g. if there is smoke.
- Have the correct equipment on site such as water, fire hoses, related hardware, equipment for moving material and written guidelines.
- Consider equipment such as tractors which could be used to fight a fire. Ensure operators understand how to use this equipment safely during a fire.
- Consider how to handle all the water that may run off the site as a result of fighting a fire. The run-off will carry nutrients, manure and ash.
- Avoid placing field heaps where the public could access them.
- Avoid placing heaps/middens adjacent to dwellings, livestock housing or fuel sources (e.g. oil tanks).
- Stack manure away from wooden walls or structural support posts.
- Avoid storing expensive equipment next to heaps/middens, particularly within buildings.
- Frequently monitor the manure for hotspots (high temperatures of over 75 °C), vents, smoke or burnt smell. Remove any materials that have temperatures greater than 80 °C. If temperatures exceed 87 °C or if the material is smouldering, notify the local fire service and get instructions on how to proceed. **Use extreme caution - a smouldering pile can burst into flame when exposed to air.**
- Ensure temperature monitoring equipment can reach the centre of the piles.

For poultry litter:

- Keep litter dry (wetting litter will not prevent a fire; just the opposite may happen).
- Protect litter from blowing rain.
- Store caked litter in a separate pile from dry litter.
- Avoid compacting moist or dry litter (field heaps should be constructed in a compact pile, but the litter itself should not be compacted).
- Stack litter no more than 1.5-2 m high (5-7 feet).
- Only dry litter should be kept in field heaps. Let moist litter piles vent naturally, e.g. in a roofed midden.
- Allow new litter to dry completely before layering it on top of old litter.

Table 24 Nutrient application limits and waste management requirements for common anaerobic digestates

Feedstock includes livestock manure	Other possible feedstocks included	QP accreditation	Nitrogen (N) limit	Phosphorus (P) limit (See section 7 for further information)	Notes
Yes - grazing livestock manure only	Green energy crops	Not applicable	170 kg/ha total N or 250 kg/ha total N on derogated farms.	Crop P_2O_5 requirement (except if digestate is produced on the holding from feedstocks generated on the holding).	Loadings from other livestock manures must be taken into account. No waste management licensing requirements to spread this digestate
Yes- grazing and non-grazing	Green energy crops	Not applicable	170 kg/ha total N	Crop P_2O_5 requirement (except if digestate is produced on the holding from feedstocks generated on the holding).	Loadings from other livestock manures must be taken into account. No waste management licensing requirements to spread this digestate
Yes	Green energy crops plus waste feedstocks	Yes	170 kg/ha total N	Crop P_2O_5 requirement	Loadings from other livestock manures must be taken into account
Yes	Green energy crops plus waste feedstocks	No	Whichever is lower - 170 kg/ha total N or crop N requirement.	Crop P_2O_5 requirement	Must only be applied under the terms of a Waste Management Authorisation.

Feedstock includes livestock manure	Other possible feedstocks included	QP accreditation	Nitrogen (N) limit	Phosphorus (P) limit (See section 7 for further information)	Notes
Yes	Green energy crops plus waste feedstocks with records of proportions of feedstocks	Yes	Proportion of digestate from livestock manure - 170 kg total N. Proportion of digestate not from livestock manure - crop N requirement.	Crop P_2O_5 requirement	User must provide evidence to NIEA of proportions. No waste management licensing requirements to spread this digestate.
		No	Whichever is lower - 170 kg/ha total N or crop N requirement	Crop P_2O_5 requirement	Must only be applied under the terms of a Waste Management Authorisation
No	Green energy crops Only	Not applicable	Crop N requirement	Crop P_2O_5 requirement (except if digestate is produced on the holding from feedstocks generated on the holding)	No waste management licensing requirements to spread this digestate
No	Green energy crops plus waste feedstocks	Yes	Crop N requirement	Crop P_2O_5 requirement	No waste management licensing requirements to spread this digestate
No	Green energy crops plus waste feedstocks	No	Crop N requirement	Crop P_2O_5 requirement	Must only be applied under the terms of a Waste Management Authorisation

Fertilisation plan template for non-derogated farm

Phosphate (P_2O_5) planning sheet												
Grass/crop details					Organic manure (including livestock manures)				Chemical (P_2O_5) fertiliser			Total P_2O_5 to be applied per ha (kg) ((H) + (K)) ÷ (B)
Field No.	Crop	Area of crop (ha)	Soil P index (from analysis)	P_2O_5 require-ment for crop according to soil P index (kg per ha) Annex J*	Type of organic manure to be applied Annex G*	Total amount of organic manure to be applied (m^3 or t)	Available P_2O_5 content of organic manure to be applied (kg per m^3 or t) Annex G*	Total amount of available P_2O_5 supplied to crop in organic manure (kg) (F) x (G)	Type of fertiliser product to be applied	Total amount of fertiliser product to be applied (kg)	Total amount of P_2O_5 from fertiliser to be applied (kg) (I) x (J)	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

Area

1 hectare (ha) = 10,000 square metres (m^2)
1 hectare = 2.47 acres
1 acre = 0.405 hectares

Volumes

1 cubic metre (m^3) = 1,000 litres (l)
1 cubic metre = 220 gallons (gal)
1 cubic metre is assumed to weigh 1 tonne (t)
1 litre = 0.22 gallons
1 gallon = 0.0045 m^3 or 4.55 litres
1,000 gallons = 4,545 kilograms (4.5 tonnes)

Weight

1 kilogram (kg) = 2.2 pounds (lbs)
1 pound = 0.45 kilograms
1 tonne = 1,000 kilograms
1 metric tonne = 0.98 imperial ton

Application rates

1 m^3 per hectare = 90 gallons per acre
1 gallon per acre = 0.011 m^3 per hectare
50,000 litres per hectare = 50 m^3 per hectare = 4,500 gallons per acre
1 tonne per hectare = 0.4 ton per acre
1 ton per acre = 2.5 tonnes per hectare.

Gallons per acre to m^3 per hectare (approx)

Gal per ac	90	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500
m^3 per ha	1	5.5	11	17	22	28	33	39	44	50

Fertilisers

1 unit per acre = 1.25 kilograms per hectare (kg per ha)
1 kilogram per hectare = 0.8 units per acre
1 kilogram P = 2.29 kilogram P_2O_5
1 kilogram P_2O_5 = 0.44 kilogram P

Fertiliser bags/acre to kilogram fertiliser product/hectare

1 bag fertiliser = 50 kilograms (kg)

1 bag per acre (ac) = 2.5 bags per hectare (ha) (1 acre = approx 2.5 hectares) (1 x 2.5)

2.5 bags per hectare x 50 kilograms = 125 kilograms fertiliser product per hectare applied

Kilogram fertiliser product applied to kilogram fertiliser nutrient applied $N.P_2O_5.K_2O$

Kilogram product applied x % $N.P_2O_5$ .K_2O in the bag.

Example of Fertiliser application:

1 bag 25.5.5 applied per acre applied (1 bag per acre = 125 kilogram per hectare product) 25% of the bag is N, 5% is P_2O_5 and 5% is K_2O.

Kilogram N = 25% x 125 kilograms = 31.25 kilograms Kilogram P_2O_5 = 5% x 125 kilograms = 6.25 kilograms Kilogram K_2O = 5% x 125 kilograms = 6.25 kilograms

Length

Feet	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Metres	0.3	0.61	0.91	1.22	1.52	3.05	4.57	6.1	7.62	9.14	10.67	12.19	13.72	15.24

Notes:

A ‘unit’ is 1% of 1 hundredweight, or 1.12 pounds Tonne = metric tonne

Ton = imperial ton

Cattle type	Livestock units (LU)
Dairy cows	1.0
Beef cows	0.8
Breeding bull	1.0
Cattle over 2 years	0.8
Cattle 1 to 2 years	0.6
Cattle under 1 year old	0.4

Northern Ireland Environment Agency (NIEA)

Water Management Unit, **17 Antrim Road, Lisburn BT28 3AL**

Useful telephone numbers

Agriculture Regulation Team: Nutrients Action Programme (NAP), NAP Derogations & field storage of poultry litter.	**028 9262 3280** **028 9263 3486**
Silage and Slurry issues: Contact NIEA before planning to substantially alter any existing storage facility or commission new silos or slurry tanks.	**028 9262 3280** **028 9263 3486**
Groundwater Authorisations: Authorisation for disposal of spent sheep dip.	**028 9262 3279**
Applying Sewage Sludge to Land	**028 9262 3280** **028 9263 3486**
Registration of Waste Carriers	**028 9056 9389**
Simple Waste Management Exemptions	**028 90569380**
Other Waste Management Exemptions	**028 90569380**
Hazardous Waste Queries	**028 9056 9710**
Pollution Prevention and Control (PPC) licensing	**028 9056 9299**
24hr Pollution Hotline Number	**Freephone 0800 80 70 60**

Department of Agriculture, Environment and Rural Affairs (DAERA)

Useful DAERA telephone **(Note: 0300 numbers are charged at local rate)**

Environment Awareness Agri-environment scheme information. Countryside Management advice including Cross-Compliance, Nitrates Directive, Nutrients Action Programme, Codes of Good Agriculture Practice, Farm Waste Management, Uncultivated Land Regulations and Field Boundary Removals.	**0300 200 7842**
Education and Training The College of Agriculture, Food and Rural Enterprise offers training on topics including Cross-Compliance, Nutrients Action Programme and Nutrient Management Planning (www.cafre.ac.uk).	**0300 200 7841**
DAERA Corporate Services DAERA Headquarters, Press Office, Information Services and Systems, Human Resources and Facilities Management.	**0300 200 7850**
DAERA Animal By-Products Section	**028 9052 5275**
Textphone For people with hearing difficulties.	**0300 200 7851**
Calls from non-UK numbers or networks/international calls	**+44 (0)28 9049 5780**
A list of DAERA contact numbers can be obtained by visiting the Contact Us section of the DAERA Website - www.daera-ni.gov.uk	

DAERA Direct Offices **Public office opening hours are 9.00 am-4.00 pm each working day**

Location and Email Address	Postal Address
Armagh daeradirect.armagh@daera-ni.gov.uk	Atek Building, Edenaveys Industrial Estate, Newry Road, Edenaveys, ARMAGH BT60 1NF
Ballymena daeradirect.ballymena@daera-ni.gov.uk	Academy House, 121a Broughshane Street, Town Parks, BALLYMENA BT43 6HY
Coleraine daeradirect.coleraine@daera-ni.gov.uk	Crown Buildings, Artillery Road, Millburn, COLERAINE BT52 2AJ
Downpatrick daeradirect.downpatrick@daera-ni.gov.uk	Rathkeltair House, Market Street, Demesne of Down Acre, DOWNPATRICK BT30 6LZ
Dungannon daeradirect.dungannon@daera-ni.gov.uk	Crown Buildings, Thomas Street, Drumcoo, DUNGANNON BT70 1HR
Enniskillen daeradirect.enniskillen@daera-ni.gov.uk	Inishkeen House, Killyhevlin Industrial Estate, Killyhevlin, ENNISKILLEN BT74 4EJ
Magherafelt daeradirect.magherafelt@dardni.gov.uk	Units 36 - 38, Meadowlane Shopping Centre, Moneymore Road, Townparks of Magherafelt, MAGHERAFELT BT45 6PR
Mallusk daeradirect.mallusk@daera-ni.gov.uk	Castleton House, 15 Trench Road, Grange of Mallusk, Mallusk NEWTOWNABBEY BT36 4TY
Newry daeradirect.newry@daera-ni.gov.uk	Glenree House, Unit 2, Springhill Road Carnbane Industrial Estate, Carnbane NEWRY BT35 6EF
Newtownards daeradirect.newtownards@daera-ni.gov.uk	Sketrick House, 16 Jubilee Road, Corporation South, NEWTOWNARDS BT23 4YH
Omagh daeradirect.omagh@daera-ni.gov.uk	Sperrin House, Sedan Avenue, Lisnamallard, OMAGH BT79 7AQ
Strabane daeradirect.strabane@daera-ni.gov.uk	Strabane Government Buildings 18 Urney Road, STRABANE, BT82 9BX

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