

To: [REDACTED] Humberto.DELGADO-ROSA@ec.europa.eu (Humberto.DELGADO-ROSA@ec.europa.eu), [REDACTED]
Fra: Annette Schneider Nielsen (anschn@um.dk)
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Dear all
Please find attached the announced material for the meeting tomorrow Friday 8 January 2016, 9.00. Please accept our apologies for the delay.
Kind Regards
Annette Schneider

ANNETTE SCHNEIDER / ANSCHN@UM.DK
MILJØRÅD/ENVIRONMENT COUNSELLOR
DIRECT +3222330801

THE PERMANENT REPRESENTATION OF DENMARK TO THE EU
PERMANENT REPRESENTATION OF DENMARK TO THE EUROPEAN UNION / 8-1040 BRUXELLES
PHONE +32 (2) 233 0811 / EU.UM.DK

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6 January 2016**Follow-up note on achievement of environmental objectives according to the Water Framework Directive as a result of new nitrogen regulation**

At a meeting by video link on 16 December 2015 concerning a new Danish nitrogen regulation, the European Commission requested Denmark to account for the extent of fulfillment of environmental objectives according to the Water Framework Directive as a consequence of an intended new nitrogen regulation.

This note reports the extent of achievement of environmental objectives in Danish coastal waters which have been drawn up in preparation of the river basin management plans (RBMPs) 2015-2021; the draft RBMPs have been subject to public consultation during the first semester of 2015. In addition, the note reports calculated target loads and reduction needs of nitrogen loads as well as the expected fulfillment of environmental objectives in 2021, all resulting from the intended less restrictive nitrogen regulation and planned nitrogen reduction loads towards 2021 as well as postponed reductions towards 2027 (exemptions). Finally, the fulfillment of environmental objectives in ground waters is addressed.

Status classification of coastal waters.

There are 119 coastal water bodies in Denmark. In the draft RBMPs 2015-2021, which have been subject to public consultation, the environmental objective of good ecological status has been achieved for two coastal water bodies (fig. 1).

structural development in society (agriculture etc.) as well as new nitrogen reduction measures may imply that larger nitrogen reductions than needed for obtaining good ecological status appear for certain marine areas.

Target loads for each coastal water body are "Danish targets loads" and generally based on the premise that until 2027 measures to achieve good environmental status in the adjacent Danish water bodies are implemented; and further that internationally, measures against waterborne as well as airborne nitrogen emissions towards 2027 are also implemented.

Expected achievement of environmental objectives in coastal waters in 2021

The following three management actions will affect the level of achievement of environmental objectives in coastal waters in 2021: 1) Baseline 2021 which can be characterized as the accumulation of the effect of measures already in place, structural development etc., 2) less restrictive nitrogen regulation, and 3) measures 2015-2021. These three actions mean that the Danish land-based nitrogen loading of coastal waters in 2021 is expected to be reduced to a level supporting that 48 coastal water bodies (40%) will meet the objective of good ecological status. However, there are some conditions associated with the estimated effects of these management actions. These comprise uncertainties related to e.g. the use of voluntary measures, baseline 2021, and establishment of targeted regulation of nitrogen leaching at the farm level. These uncertainties imply that the actual number of coastal water bodies that reach good ecological status could be both higher and lower.

The nitrogen loads to coastal waters in the second planning cycle is thereby expected to be reduced annually by about 7,960 tonnes of nitrogen (14%), from about 56,800 tonnes N/year in 2012 to about 48,800 tonnes N/year in 2021. The reduction in the land-based nitrogen loads to coastal waters until 2021 is a result of the following management actions:

Management actions	Effect of load reductions of coastal waters (tonnes N/year)
1. Baseline 2021	6,958
2. Less restrictive nitrogen regulation	-6,428
3. Measures 2015-2021	7,430*
TOTAL	7,960

* The more types of measures, the more likely it is that some of these is implemented in areas/catchments without a nitrogen reduction need or with a potential for additional nitrogen discharge. For the specific measure, EFA (ecological focus area), it is not possible to place the effect targeted in areas with a nitrogen reduction need, while this is possible for other measures. It is estimated that approximately 464 tonnes N of this nitrogen reduction is assessed to be located in catchment areas where there are no reduction required. Towards the publication of the final RBMP, the location of this effort will be optimized according to the reduction effort.

1) Baseline 2021:

Until 2021 a further reduction in nitrogen loads to coastal waters is expected as a result of already implemented or planned measures within the river basin districts. Thus, agricultural measures, already adopted major restoration projects such as wetlands, as well as municipalities' ongoing efforts in the area of wastewater treatment are all expected to contribute to further reductions in nitrogen discharges. In the draft RBMPs the effect of already implemented or planned actions amounted to approximately 8,400 tonnes N/year (baseline effect). The research institutions have revised down the baseline effect to about 6,958 tonnes N/year (review in relation to river basin management plans in public consultation), which include corrections on the effects of catch crops, buffer zones, crops for energy use, area of organic crop production, improved utilization of manure, approvals of agricultural farms, nitrogen deposition, cutting of grasslands instead of grazing, development in yields and effects of efforts for wetland restoration. The adjustment of baseline 2021 does not include a correction for the effects of the less restrictive nitrogen regulation (see below).

2) Less restrictive nitrogen regulation and potential for additional nitrogen discharge:

The planned less restrictive nitrogen regulation increases the nitrogen discharge by 6,428 tonnes N/year all other things being equal. The less restrictive nitrogen regulation with estimated effects (increased discharges to coastal waters) includes the following:

Less restrictive nitrogen regulation	Effect – increased loss of nitrogen to surface waters (tonnes N/year)
Lifting the reduced general fertilization standards for nitrogen to the level of economic optimum	4,726
A minor adjustment of the prohibition of soil tillage in the autumn	51
Growth plan for aquaculture	243
Annulment of the statutory buffer strips along lakes and watercourses*	728
Annulment of the statutory 60.000 hectare catch crops**	680
TOTAL	6,428

* Statutory buffer strips are part of the estimated baseline 2021 reduction, which is to say that the measure was implemented recently and as such, its effect is largely estimated not to have been realized as of 2012.

** The 60.000 hectare catch crops are part of a political agreement yet to be implemented. As such their annulment represents a change of a political agreement rather than a change of regulation, and will not cause environmental change. Nonetheless it is presented as a change of regulation in the presentation because it is also part of the baseline 2021 reduction.

Regardless of the positive environmental impact of the baseline efforts until 2021, the planned less restrictive nitrogen regulation leads to a temporary additional nitrogen load to the aquatic environment. Towards 2018 compensatory measures are implemented to counter the temporary additional load. The provisional measures to avoid increased nitrogen discharge include two types of initiatives, one is a change of farmers' opportunities for flexibility in terms of meeting national calls for establishing environmental focus areas, the other being a targeted land lease model that ensures the laying out of additional catch crops.

A limited additional nitrogen discharge to coastal waters is expected in 2016 as a result of the less restrictive nitrogen regulation because the above-mentioned provisional measures can be implemented only with effect from 2017. However, it will be sought to target the part of the collective effort that is undertaken already in 2016 on water bodies which, after offset of effects of baseline 2021 and EFA, receive additional nitrogen loads.

From 2018, a new targeted regulation of nitrogen leaching at farm level will be introduced which handles reduction needs pointing forward (see below).

3) Measures 2015-2021:

New initiatives towards 2021, including targeted efforts (nitrogen reduction) from 2019, are expected to reduce discharges to coastal waters with 7,430 tonnes N/year. The effort will be allocated on the following measures:

Measure	Effect of load reductions of coastal waters (tonnes N/year)
Planned measures – corresponding to RBMBs in public consultation:	1,472
<ul style="list-style-type: none"> • Set-aside of farmland on organogenic soils in river valleys • Establishments of wetlands • Waste water treatment 	
Voluntary collective measures:	1,435
<ul style="list-style-type: none"> • Establishment of wetlands 	385
<ul style="list-style-type: none"> • Establishment of small constructed wetlands (mini-wetlands) 	900
<ul style="list-style-type: none"> • Aforestation 	150
Compulsory measures:	4,703
<ul style="list-style-type: none"> • Ecological Focus Area (EFA) - the EFA area can be established by buffer strips, catch crops, fallow land, coppice and GAEC landscape elements 	867
<ul style="list-style-type: none"> • A targeted regulation of nitrogen leaching at farm level 	3,836
TOTAL	7,610*

* The more types of measures, the more likely it is that some of these is implemented in areas/catchments without a nitrogen reduction need or with a potential for additional nitrogen discharge. For the specific measure, EFA (ecological focus area), it is not possible to place the effect targeted in areas with a nitrogen reduction need, while this is possible for other measures. It is estimated that approximately 464 tonnes N of this nitrogen reduction is assessed to be located in catchment areas where there are no reduction required. Towards the publication of the final RBMP, the location of this effort will be optimized according to the reduction effort.

The expected fulfillment of the environmental objectives of coastal waters in 2027

Part of the nitrogen reduction need of coastal waters corresponding to approximately 6,200 tonnes N/year is expected to be postponed to the 3rd planning cycle. In the draft RBMPs, no decision had been taken on measures to reduce 6,200 tonnes of N/year. As such, the draft RBMPs have the same level of ambition as the scenario described in this note. In 2021 71 coastal water bodies (60%) remain in which the nitrogen load has not yet been reduced to a level that supports the achievement of good ecological status (fig. 2). Concurrently with implementing this effort a Danish potential for additional nitrogen discharge (of about 1,500 tonnes /year) will emerge towards 2027 in certain coastal water bodies, as stated above.

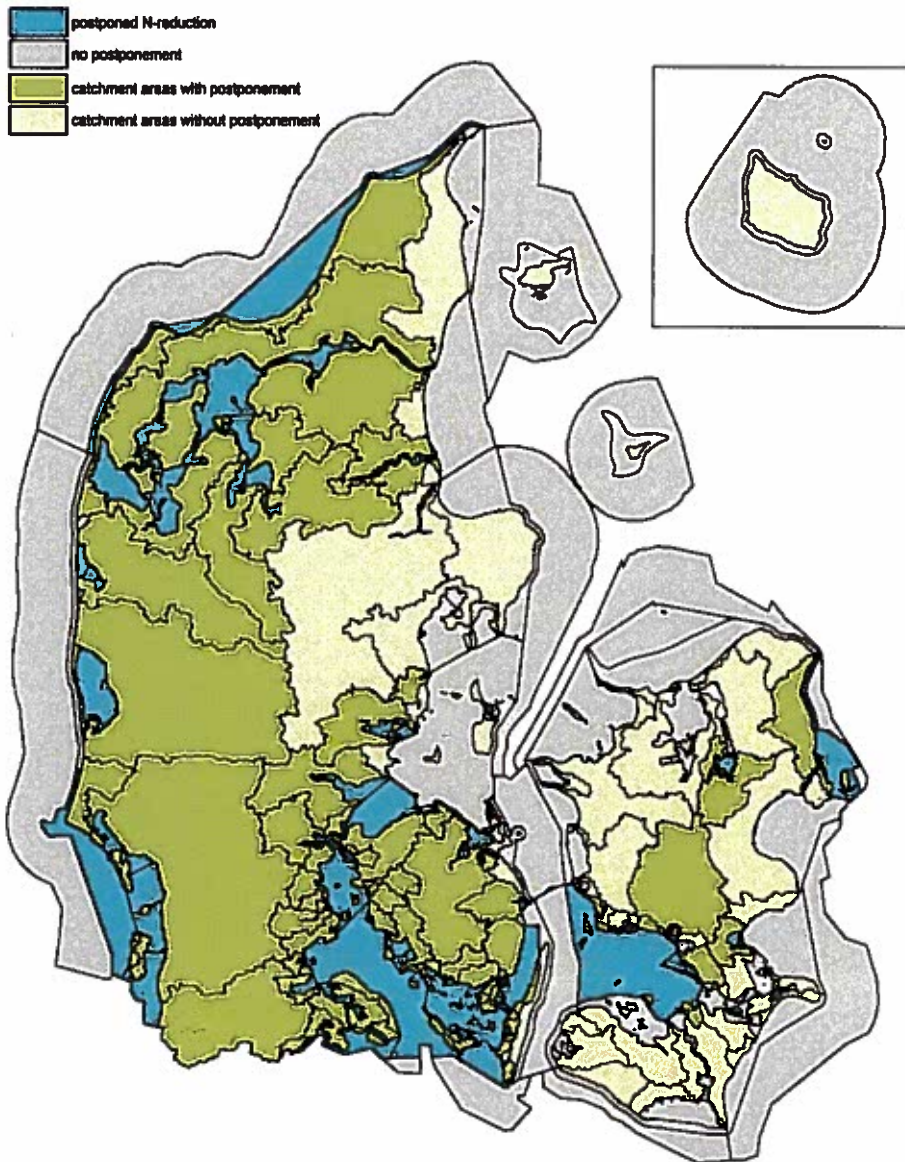


Figure 2. Coastal waters with postponement of part of the nitrogen reduction need (6.200 tons N/year) to the 3rd plan period, 2021-2027

Achievement of environmental objectives in groundwater

In the draft river basin management plans for the period 2015-2021, the assessment of chemical status for groundwater bodies is based on groundwater quality standards and threshold values for pollutants. The review reveals that 169 (out of 402) groundwater bodies are in good status, 110 groundwater bodies are in poor status, and 123 bodies have unknown status. In addition, a significant and sustained upward trend in the concentrations of one or more pollutants has been identified in 37 groundwater bodies. Of these 37 groundwater bodies, 18 have been identified to be in poor chemical status in relation to nitrate, i.e more than 20% of each of these groundwater bodies is assessed to have a nitrate concentration exceeding 50 mg/liter. In addition, 23 groundwater bodies have been identified with a significant and sustained upwards trend above 75% of the groundwater quality standard with regards to nitrate. Of these 23 groundwater bodies 4 have been identified to be in poor chemical status in relation to nitrate.

The targeted regulation in effect as of 2018 and replacing the existing nitrate regulation of agriculture, is also intended to protect the groundwater. The new targeted regulation along with the existing general regulation will meet the need of measures for groundwater bodies as proposed in the draft river basin management plans 2015-2021. Thus the groundwater in general is expected to be in good chemical status after 2021. It should be noted that in general the chemical status of groundwater bodies develops slowly.

It should be noted that before the implementation of the new targeted regulation there is a risk that the nitrate load to groundwater bodies will increase - as a consequence of the lifting of the reduced general fertilization standards for nitrogen from 2016. The increased load will be countered by compensatory measures, i.e a land lease scheme with catch crops or similar and greening requirement (EFA-areas), as described above. In addition all drinking water is protected via municipal action plans which will be reviewed as necessary.

Heading for a good marine environment

(Translation from the Danish paper: Water and Soil (<http://www.vand-og-jord.dk/>))

On 22 December 2014, the second-generation river basin management plans were put into public consultation. The plans are based on an entirely new marine toolbox, which is the result of a technically challenging model project. The new tools address the criticism of the first-generation river basin management plans by improving the marine, scientific basis for management of the coastal waters. This article describes the basic elements of the toolbox.

Authors

Anders Chr. Erichsen* (aer@dhigroup.com), Jesper Christensen**, Hanne Kaas*, Trine Cecilie Larsen*, Stiig Markager**, Ciarán Murray**, Flemming Møhlenberg*, Erik Koch Rasmussen* and Karen Timmermann**.

* DHI Group, Agern Alle 5, DK-2970 Hoersholm

** Aarhus University, Department of Bioscience, Frederiksborgvej 399 (postbox 358), DK-4000 Roskilde

Introduction

An intense work was carried out to improve the marine scientific basis from the first-generation to the second-generation river basin management plans. The overall purpose of the work was to develop model tools that increase the knowledge on the relations between, especially, nutrients and the environmental condition in the 119 marine water framework areas defined in Denmark. This new toolbox has provided the national water management a new tool to define the maximum loads and the necessary efforts regarding the discharge of nutrients that may promote good environmental status (GES) in coastal waters and fiord areas, and thus to prepare the newly published drafts for river basin management plans.

DHI and Aarhus University developed the model tools for use in water management. The model toolbox comprises mechanistic and statistic models, and specific models now exist for more than 90% of the total marine water body administered in accordance with the Water Framework Directive, corresponding to almost 70% of the total catchment area. DHI was responsible for the development of the mechanistic models, while Aarhus University developed the statistic models, and together DHI and Aarhus University developed a concept making it possible to use the model results to estimate the necessary efforts for all water bodies.

The developed model tools and their use can be found in the report series 'Implementation of models to be used in water management. Models for Danish fiords and coastal marine areas' (in Danish), see /1/, /2/, and /3/, and this article presents the general concepts and results.

Good environmental status

The classification of good environmental status in the Water Framework Directive is based on the use of three biological quality elements: Phytoplankton, benthic vegetation and benthic fauna. More indicators are used for each quality element, and at present inter-calibration of one indicator for each quality element has been carried out in Denmark. The developed model tools focus on phytoplankton, described as summer chlorophyll concentration, and benthic vegetation, described as the potential maximum depth for eelgrass. The indicator for the third quality element, benthic fauna, is based on the species composition and cannot be directly deduced from the models.

In addition to the biological quality elements, the models can describe physical and chemical supporting parameters, which may be included in the evaluation of the good environmental status. In this work these parameters comprise nutrient concentrations, oxygen depletion and ecological effects of oxygen depletion.

Eelgrass described by means of light

Eelgrass is an important biological element when estimating the marine environmental condition. In Denmark, the maximum depth for the main distribution of eelgrass is used as the indicator for eelgrass. As it is not possible to use the developed models to describe the depth limits directly, the light penetration into the water (expressed as the light attenuation coefficient K_d) is used as a proxy indicator for the potential depth maximum for eelgrass.

The light may be used to express the potential depth maximum for eelgrass, as sufficient light is a decisive condition for the growth of eelgrass to the depth limit of the environmental goals. On the other hand, good light conditions do not necessarily mean that eelgrass grows, as other factors, such as for instance sediment conditions and oxygen depletion, are also decisive.

At the same time the light penetration makes it possible to use both types of models and thus strengthen the estimation of the necessary efforts. In order to use the light attenuation coefficient (K_d) as a proxy indicator the environmental targets for the maximum depth are recalculated as a measure for the light penetration.

Model tools – statistic models

The statistic models describe annual variations in the environmental parameters total nitrogen (TN) and total phosphorus (TP), summer chlorophyll, and light attenuation coefficient (K_d) based on changes in the nitrogen load from Danish catchments, climate conditions and physical-chemical conditions. The models are based on the use of data from the coastal monitoring stations where relatively long (>15 years) time series exists, which are a prerequisite for the necessary robustness of the models. Data from the period 1990-2012 were used to develop the models.

The statistic models are site specific (see figure 1 which shows the area covered by the different models) and describe the empirical relationship between the environmental condition and the physical/chemical explanatory variables which best describe the condition.

The models are developed by testing a number of the combinations of explanatory variables and periods and subsequently selecting the explanatory variables that give the best connection with the indicator. The final model for the indicator is a linear multi-variable model with up to four independent parameters, see /3/.

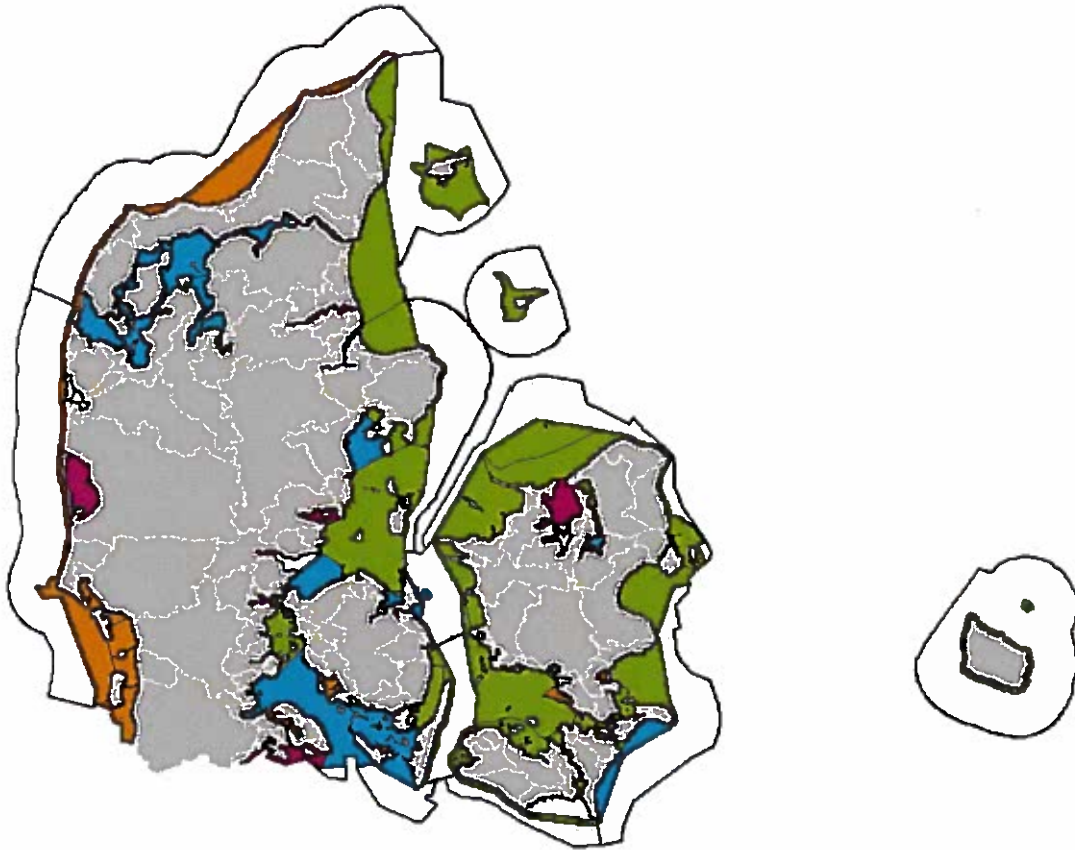


Figure 1: Water bodies covered by statistical models (purple), mechanistic models (green), both statistical and mechanistic models (blue) and meta-models (orange).

For the models where the nutrient supply was chosen as an explanatory variable a linear relation between the supplies and the indicator value can be deducted. Based on this relation and the knowledge on the present condition and environmental targets the necessary reduction to meet the environmental target can be calculated (figure 2). This is converted into a maximum load, i.e. the maximum nutrient load, which supports the fulfilment of the environmental target, and hence the necessary action for reduction based on each indicator.

In addition to the indicators for light attenuation and summer chlorophyll, supporting parameters for the statistical models were used to obtain a better and more robust estimate of the required action to obtain GES. The additional indicators include oxygen depletion and oxygen depletion effects and an indicator for nitrogen limitation of phytoplankton growth. The necessary action for each of the indicators is calculated, and the resulting action for the specific water body is calculated as a weighted average.

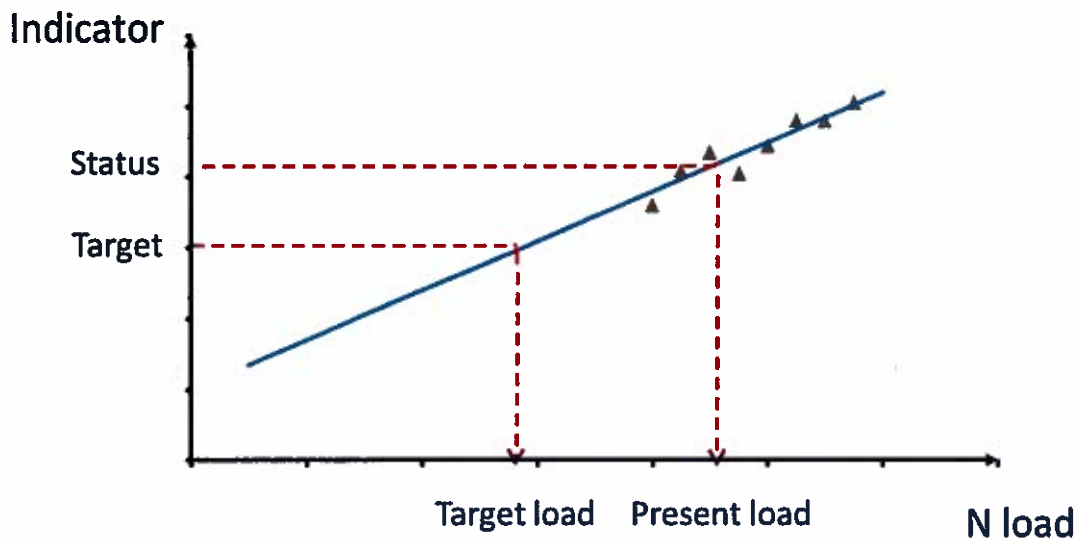


Figure 2: Schematic diagram showing the relation between the explanatory variable nitrogen load and an environmental indicator. Points indicate year-to-year observations of the indicator. The blue line shows the linear relationship between nitrogen load and the indicator.

Model tools – mechanistic models

The mechanistic models simulate the function of the ecosystems by means of a formula apparatus describing the interrelationships in the ecosystem, and the reaction of the ecosystems to external conditions such as the load of nitrogen, see /2/. The nutrient load in the models comprises loads from the catchment areas and from the atmosphere. Both Danish and foreign sources are included, and thus the exterior conditions comprise the substance exchange with the surrounding marine water bodies.

Four mechanistic ecosystem models are developed: One regional model covering water bodies in the inner Danish waters, and three local models covering the water bodies in the Limfjord, Odense Fjord and Roskilde Fjord (figure 1).

Each individual model is used to simulate a period of 10 years. In contrast to the statistical models, the mechanistic models do not use direct monitoring data, but monitoring data are part of the basis for the model development and the model calibration and validation. The models calculate condition, interactions and development of a large number of environmental variables – including oxygen and effects of oxygen depletion. In connection with the estimation of action only data on the two indicators summer chlorophyll and light attenuation (K_d) were used.

Eelgrass is an important biological element of the model. The model description involves many factors that influence the condition of the eelgrass, such as light conditions, oxygen depletion, sediment conditions, wave effects, etc. Some of these factors are influenced by the load of nutrients. The models also describe how the presence / absence of the eelgrass affects the function of the ecosystem. Thus, the models comprise both the effects on eelgrass and the effects of the eelgrass 'feedback' mechanisms on the ecosystems.

In order to be able to determine the needed action in the areas where the environmental condition does not meet the environmental requirements the models are used to simulate more scenarios to illustrate the effects of reductions in the nutrient load. Considering the many water bodies and the many nutrient sources, an infinite number of scenarios can be defined. This is practically impossible. Therefore, a method was developed that makes it possible to screen the effect of changes of the nutrient load in the individual water bodies on the basis of a limited number of scenarios (relations corresponding to figure 2, but based on the results from the mechanistic modelling). In each scenario, the present nitrogen supply is reduced by the same percentage all over Denmark. The scenarios also include changes in the load of phosphorus, but as the effects of phosphorous reductions are very limited or non-existing, only the nitrogen relations are used to develop the river basin management plans.

Besides making it possible to establish relations between nitrogen supply from Danish catchment areas and the environmental target indicators the method also forms the basis for an analysis of the importance of the Danish nutrient supplies for the variation in the individual indicator. In other words, how important are Danish loads compared with loads from abroad? The result of this analysis is illustrated in figure 3, and a more detailed description is included in /2/.

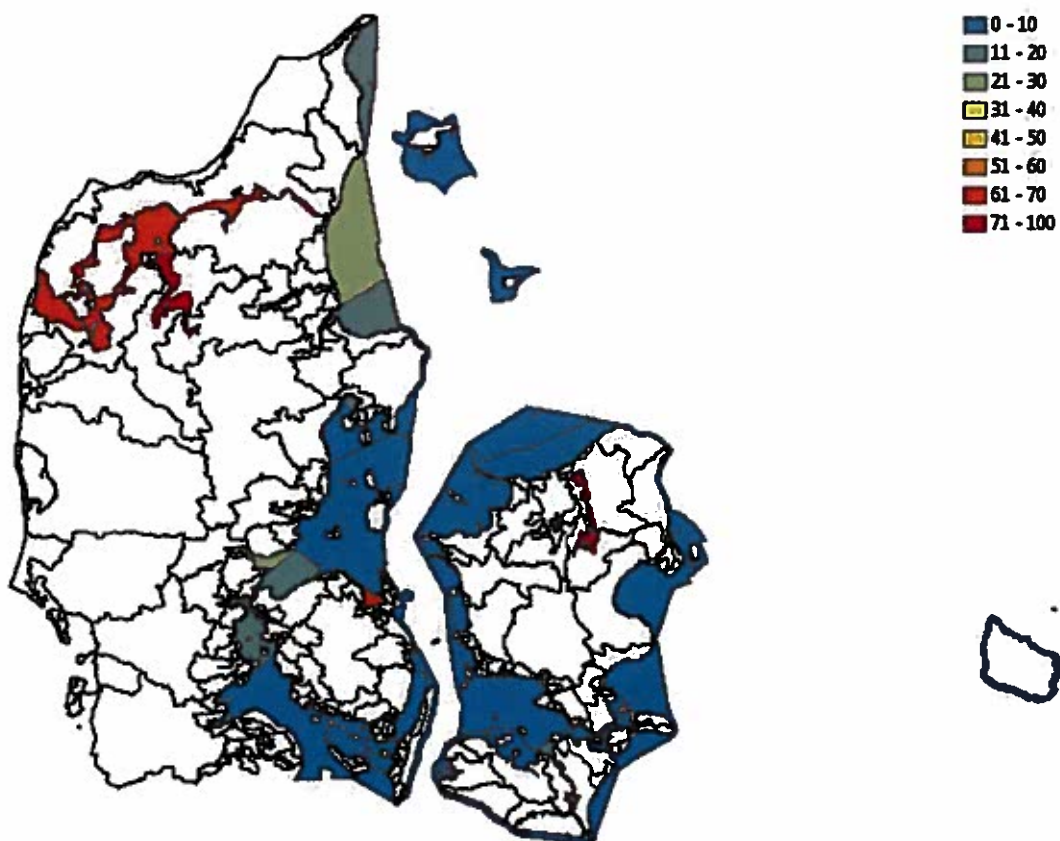


Figure 3: Share of the chlorophyll indicator that can be explained by land-based nitrogen load from Denmark. The share is specified in % of the water bodies covered by the mechanistic ecosystem models.

Model tools – Meta-analysis

For the water bodies without sufficient data to establish statistical models and which are not covered by mechanistic models a meta-analysis is applied (figure 1). In the meta-analysis knowledge from similar water bodies covered by the models is used. The implicit assumption is that a meta-area will respond in the same way to changes in the nutrient load as comparable water bodies. Thus, the modelled relationships from the comparable water bodies can be used. Meta-analyses were used for areas with sufficient observations from the period 2007 to 2012 to be able to calculate a status value for both the chlorophyll indicator and the K_d -indicator. The meta-analysis is not described further in this article and reference is made to /1/, /2/, and /3/ for a detailed description.

Need for action – method

For the analysed areas where the present environmental condition does not meet the environmental target requirements, the statistic or the mechanistic relations are used to determine the necessary nutrient load reduction to meet the environmental targets. The overall approach to determine the required actions is illustrated schematically in figure 4.



Figure 4: Summary of the method for estimating the action required for each water body.

After estimation of the necessary actions with each model tool, the results were combined according to the following principles:

1. In water bodies with local mechanistic models the necessary actions were estimated with this type of model.
2. In fiords with statistical models where no mechanistic local model is available, the necessary actions were estimated with this type of model.
3. A deviation was made if upstream water bodies need less action than downstream water bodies. In these cases the downstream action needs for both areas were applied.
4. For areas where the necessary action estimated by means of a meta-analysis the necessary action was calculated as the average of the need for action found by the statistically and the mechanistically based meta-analyses.
5. For areas where neither tool could be applied because of lack of data or models, the necessary action for 'neighbouring' water bodies was used.

Uncertainty

Forecasts will always be subject to some uncertainty. This applies also to the calculated needs for action and the corresponding target loads. Main reasons for these uncertainties with forecasts are the necessity to go beyond the models' calibration areas, and the impossibility to predict and quantify possible system changes.

The uncertainties may for instance be quantified based on the results in the areas covered by the two model approaches (ensemble modelling). In total, there is ensemble modelling for 11 water bodies, and the calculation of the uncertainty based on the results for these areas shows that the uncertainty regarding the target load lies between 6% and 28%. In spite of the differences between the two model types, there is a good quantitative consistency between the estimated needed actions.

The present situation

The purpose of the model project was to improve the scientific basis for the second-generation river basin management plans by the development of tools, which may be used to determine target load and necessary actions regarding nutrient loads to the marine areas. This goal was achieved by defining models that give specific results for a number of water bodies by using two types of models and by involving a broader description of the ecosystem. Such complex analyses always involve a certain uncertainty, but with the results, which form the basis of the second-generation river basin management plans, the marine scientific basis is significantly improved.

The complete analysis of all 119 water bodies leaves a total target load of about 42,000 tonnes N/year and a necessary action regarding nitrogen between 0% and 70%, calculated in relation to the loads in the period 2008-2012. Water bodies, which are highly affected by eutrophication (e.g. the inner part of Limfjorden and Mariager Fjord), have the strongest needs for action, whereas the water bodies, which are more open and have a higher flow-exchange rate, have an action need of 0-30%. Model scenarios with both the statistic

and the mechanistic models show that primarily the loads off nitrogen are of importance to the inter-calibrated environmental indicators, and that additional reductions of the phosphorous loads will not reduce the need for reductions in the nitrogen loads significantly. In figure 5, the calculated action needs are converted into reductions in the catchment areas.

Need for action

Percent N reduction compared to 2008-2012

N loads

- 40 to 75
- 30 to 40
- 20 to 30
- 10 to 20
- < 10%

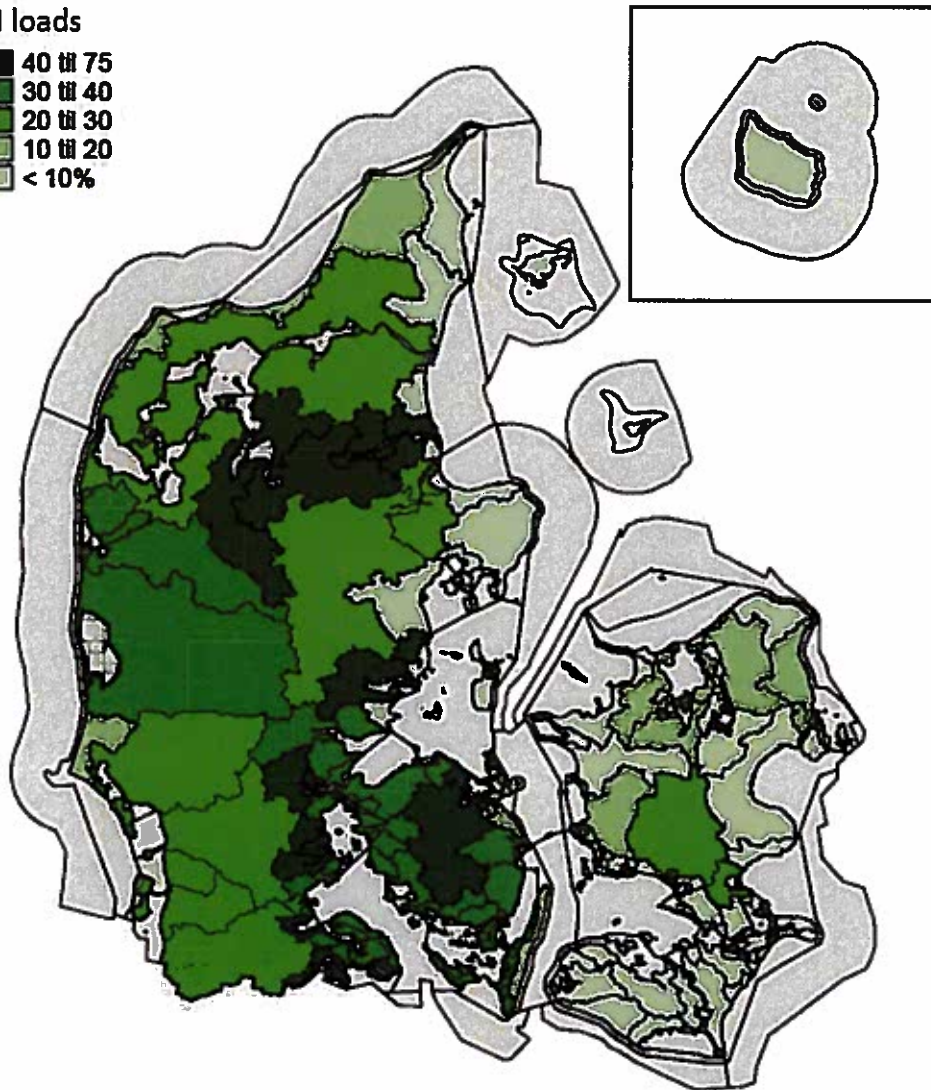


Figure 5: Percentage of the calculated effort required compared to the nitrogen supply in the period 2008-2012. Note that the effects of already agreed but not yet effected / fully effected initiatives have not been accounted for.

An additional aim of the project was to work systematically with differentiated reduction requirements for the individual water bodies. The Danish effort to reduce the loads of especially nitrogen from the 1980ies and until the first water plans appeared was based on overall national needs for reduction, i.e. the vulnerability of the different marine water bodies was not taken into consideration. It was an acceptable approach as the loads were at a very high level. This effort had an effect and – as this analysis also shows – more marine areas are now close to having a good environmental status (based on summer chlorophyll and summer K_d). In order to achieve the objective it is widely recognised that the condition and vulnerability

should be estimated for each individual water body in order to obtain the optimal environmental management, i.e. the best possible environmental condition at the lowest possible cost, see /4/. The developed toolbox contributes to reaching this objective.

Conclusion

Can we expect to achieve a good environmental status in all water bodies in 2021 with the calculated target goals and the necessary actions?

Probably not, but a number of fjords and marine areas may very likely reach the goal, and more will be close to reaching it. One important reason why not all areas will have a good environmental status in 2021 is that there may be a delay from the reduction in the nutrient supply takes place and until the good environmental status is obtained. To a large part the delay is due to the huge amounts of nutrients that are confined in the sediments, but it is also due to the difficulty of eelgrass' reestablishment in some areas. Finally, there are other factors affecting the environmental condition; nutrient supplies from other countries, climate change impacts, extraction of raw materials, and fishing, etc.; but with an effort corresponding to the model-based actions Denmark is well on the way to having a good marine environment.

References (in Danish)

/1/ NST projektet "Implementeringen af modeller til brug for vandforvaltningen". Modeller for Danske Fjorde og Kystnære Havområder – Del 1. Metode til bestemmelse af Målbekæmpelse. 2014.

/2/ NST projektet "Implementeringen af modeller til brug for vandforvaltningen". Modeller for Danske Fjorde og Kystnære Havområder – Del 2. Mekanistiske modeller og metode til bestemmelse af indsatsbehov. 2015.

/3/ NST projektet "Implementeringen af modeller til brug for vandforvaltningen". Modeller for Danske Fjorde og Kystnære Havområder – Del 3. Statistiske modeller og metode til bestemmelse af indsatsbehov. 2015.

/4/ Markager, S. & P. B. Christensen. De danske fjorde betaler regningen for 30 års miljøgæld. Natur & Miljø 2011, 4, s.8-9

Ministry of Environment and Food of Denmark

Danish AgriFish Agency/Nature Agency/Environmental Protection Agency

J.nr. 2015-6878

Date: 5 January 2016

Follow-up note

Model for intermediate compensatory measures to avoid increased N emission

In the note of 10 December 2015, the Danish Ministry of Environment and Food submitted a description of a model for intermediate compensatory measures to avoid deterioration of the aquatic environment (surface waters and groundwater) to the Commission. The model is instrumental to avoid increased N emission when lifting the reduced general fertilization standards for nitrogen, annulling the statutory buffer strips along lakes and watercourses and adjusting the prohibition on soil tillage in the autumn.

The government proposals for handling the nitrogen reduction needs until 2021 were confirmed in a political agreement on 22 December 2015. This note presents more details on the regulatory and voluntary initiatives in the model.

Changes in the national regulation on mandatory catch crops

As described in note of 10 December 2015, the need for short term nitrates reducing actions will be met in part by realizing the full nitrogen effect from the Ecological Focus Area (EFA) requirements under the EU direct payments. A total EFA area of approximately 105,000 hectares is needed in Denmark to comply with the 5 per cent EFA requirement. According to Danish legislation, the EFA area can be established by buffer strips, catch crops, land laying fallow, coppice and GAEC landscape elements.

The action relies on the following conditions to give an N reduction effect:

1. The EFA requirements must continue to be met after annulment of the Buffer strips Act in 2016. The farmer must for this purpose choose either to maintain the previously mandatory buffer strips as EFA area or alternatively use other nitrogen-reducing EFA measures that will offset the effect of the annulment of the Act.
2. The flexibility given until now to farmers to use some EFA areas as an alternative to meet the requirement for catch crops is removed in 2016. The EFA elements of land laying fallow, coppice and buffer strips can no longer be used as alternatives to the mandatory catch crops. This will increase the effect of the national requirement for 240.000 ha of catch crops on farmland.
3. Effect due to the fact that mandatory buffer strips adjacent to farmland with winter crops are not expected to be ploughed up before mid-2016.

This action will create a real and permanent N reduction effect. In all, this action is expected to contribute with a nitrogen effect of up to 1,197 tons in 2016 and 867 tonnes per year in 2017 and onwards.

Re 1:

The Ministry of Environment and Food estimates that this replacement effect results in a nitrates reduction of about 760 tonnes N per year from 2016.

In the EFA system, 1 ha of buffer strips is counted with a conversion factor of 1.5 ha EFA area, fallow with 1.0 ha EFA area and coppice or catch crops with 0.3 ha EFA. This means that the approximately 16,000 ha existing mandatory buffer strips used as EFA correspond to 24,000 ha EFA area and may, where appropriate, be replaced by for example 24,000 ha land laying fallow or 78,000 ha catch crops.

The estimates of N reduction effect when complying with EFA requirements after the annulment of the Buffer strips Act are based on the N reduction estimated by Aarhus University. The impact on the marine environment is estimated by converting the root zone effect using an average nitrates retention estimate of 71 percent. For the buffer strips a retention rate of 0 per cent is used.

Re 2:

In addition to the 16,000 ha EFA buffer strips, farmers comply with the EFA requirement through 19,600 ha of fallow, 3,900 ha of coppice and the rest through catch crops and GAEC landscape elements. The table shows the number of hectares applied by farmers in the Danish common application scheme for direct payments 2015.

Ha	Total receiving direct payments	EFA	Used as alternatives to mandatory catch crops
Land laying fallow	27,500	19,600	11,300
Coppice	8,900	3,900	5,100
Total	36,400	23,500	16,400

The Danish Ministry of Environment and Food estimates that farmers will need to lay out approximately 11,000 ha additional catch crops to replace the EFA fallow and coppice that were until now used as alternatives to the mandatory catch crops, and that this corresponds to an N effect of about 100 tons N per year.

Re 3:

The interim effect depends on how large a number of hectares of the previously mandatory buffer strips that are maintained for the first half year of 2016. The Ministry of Environment

and Food estimates that the effect accounts for a nitrates reduction of about 330 tonnes N in 2016.

The regulatory changes will provide reduced nitrogen loss to both surface waters and groundwater. They will be implemented through revision of the Danish Order on Plant Cover with effect from August 2016. They will not affect the Danish implementation of the greening requirements pursuant to REG (EU) 1307/2013.

Cultivation restrictions (sowing of catch crops)

The scheme planned for 2017-2018 prevents nitrogen loss through the requirements for additional catch crops on the land leased. The State may achieve this objective through a simple call for tender with such requirements imposed on the land. The requirements for the catch crops will be the same as for the mandatory catch crops required by the Order on Plant Cover.

The scheme is expected to be open for commitments over a two year period (2017-2018) with an estimated average price of DKR 700 per ha per year (the difference between the rent offered and the rent achieved for re-lease with requirement for catch crops). The Ministry of Environment and Food estimates that at least 8,500 land lease transactions are needed to reach the target of 818 tonnes N in 2017 and 693 tonnes N in 2018, covering 85.500 ha in 2107 and 72.500 ha in 2018 in total.

The land lease model will be targeting groundwater in order to avoid deterioration of groundwater and reverse any significant and sustained rising trends of nitrate in the groundwater. The Geological survey of Denmark and Greenland is evaluating the groundwater status and the need for geographic targeting of compensatory measures in relation to groundwater. The full evaluation will be completed in June 2016.

The required catch crops cannot replace establishment of the catch crops required by the Order on Plant Cover nor replace any of the EFA requirements under the Single Payment Scheme.

As discussed at the meeting with the Commission on 16 December 2015, the Ministry of Environment and Food suggests a simple public call for tender model to receive offers from farmers for placing additional catch crops on their farmland in exchange for a specified payment. There will be no state aid, since the payment is on market terms. When deciding on offers, the Ministry of Environment and Food would give priority to the lowest payment in combination with best placement of the catch crops. Such a tender model will be easy to implement and environmentally efficient.

There will be a control mechanism, since relevant market rates will be established by skilled evaluators from state institutions on basis of market evaluations and statistics.

Strategic Environmental Assessment

The Ministry of Food and Environment has prepared a Strategic Environmental Assessment (SEA) of the regulatory changes proposed on agricultural use of fertilizer. Prior to preparation of the SEA report ("Miljørapport for forslag til plan om ændrede gødskningsnormer", December 2015), relevant authorities had the opportunity to provide input on issues which should be included. The report is in Public hearing for eight weeks in December 2015 with a deadline on 17 February 2016.

The SEA report concludes that the phasing-out of the norm reduction can be implemented along with the above compensatory measures without entailing a negative environmental impact in the majority of the water bodies. But it will cause a temporary additional supply of nitrogen for some coastal waters totalling approximately 220 tonnes and an extra supply of nitrate to groundwater in 2016. The Ministry of Environment and Food will examine possibilities to implement additional nitrogen reducing measures for this purpose in specific geographical areas.

Ministry of Environment and Food of Denmark

Danish AgriFish Agency/Nature Agency/Environmental Protection Agency

J.nr. 2015-6878

Date: 5 January 2016

Follow-up note

Timeline for legal steps as regards the new N and P regulation short and long term

In note of 10 December 2015, the Danish Ministry of Environment and Food submitted a note to the Commission on the future regulation of plant nutrients to the aquatic environment in three steps. The three steps are necessary to avoid increased N emission when lifting the reduced general fertilization standards for nitrogen, annulling the statutory buffer strips along lakes and watercourses and adjusting the prohibition on soil tillage in the autumn.

On 22 December 2015, the government proposals for handling the nitrogen reduction needs until 2021 were confirmed in a political agreement. This note presents a timeline on the regulatory and programme steps that are necessary to implement the model.

2016	Regulatory steps	Changes to Danish Nitrate Action Programme (NAP)
Step one –Short term changes of the regulation of nitrates		
January	Public hearing of Strategic Environmental Assessment (SEA) of draft changes to Order on the agricultural use of fertilizer. Deadline 17 February.	Development of draft Danish NAP for period after 2015
February	Expected adoption in Parliament of <ul style="list-style-type: none"> - annulment of the Buffer strips Act - changes to provisions concerning reduced general fertilization standards for nitrogen in the Act on the agricultural use of fertilizer and on plant cover 	Continued discussions of draft NAP with the COM
February	Public hearing of draft changes to Order on the agricultural use of fertilizer (roll-back of reduction of standards with 2/3 compared to economic optimum)	DK submits request for renewal of Danish derogation concerning application of manure to be in effect from 1 August 2016
February		Third presentation on the NAP and the derogation in the Nitrates Committee
February	Changes to Order on the agricultural use of fertilizer in force	Continued discussion of draft NAP and extension of derogation with the COM. Public hearing of draft Danish NAP and SEA assessment of the draft (8 weeks)

April		Public hearing of draft Danish NAP and SEA assessment of the draft (8 weeks)
May	Public hearing of draft changes to Order on the agricultural use of fertilizer (roll-back of reduction of standards with remaining 1/3)	Government approval of draft Danish NAP
May	Public hearing of draft changes to Order on plant cover and cultivation related activities. (compensatory measure)	Expected approval of the Danish NAP by COM
June		Vote in Nitrates Committee on renewal of Danish derogation concerning application of manure
August	<p>The two changed Orders enter into force for plan period 1 Aug 2016- 31 July 2017.</p> <p>Order on plant cover and cultivation related activities enters into effect, including:</p> <ul style="list-style-type: none"> - changes in regulation on mandatory catch crops etc. (compensatory measure). <p>Extension of derogation concerning manure enters into effect by revision of the Order on Commercial Livestock, Livestock Manure, Silage etc. from 1 August 2016</p>	Extension of derogation concerning manure enters into effect.
Step two - Aligning the harmony rules on nitrates contents and ensuring a more direct regulating of phosphorous in a new regulation of livestock holdings		
2016		
Spring/summer		Discussion of new regulation of phosphorus and revision of harmony rules with the COM
October	Proposal of revision of act that ensures statutory authority for a new regulation of phosphorus and for revision of harmony rules (regulation of livestock units per hectare)	
December	Act adopted in Parliament	
2017		
August	All orders on new regulation of livestock production are in effect	Begin revision of Nitrates Action Programme accordingly
Step three - New mandatory targeted nitrates regulation with effect from 2018		
2018	<u>The need for revision of acts are under consideration</u>	

To: Christian Vind (chvin@mfvm.dk)

Cc: Line Andersen (land@mfvm.dk)

Fra:

Titel: RE: Follow-up notes to the meeting 8th of January.

Sendt: 28-01-2016 17:24:35

Dear Christian Vind,

Thank you for your message and for sharing further documents related to nitrogen regulation in Denmark, which required further assessment and internal discussion during the last week. In addition I was taken in meetings most of the past few days.

Following your proposal, and as conveyed by my Director in the phone call with Deputy Permanent Secretary Mikkelsen, my colleagues would be available for a technical workshop to further understand elements concerning the documents you have sent (e.g. follow-up notes and the baseline report and its revision).

We are trying to find a room for Friday 5 February, from 10:00 to 13:00.

My colleague (in copy) will contact you soon to define the details of the workshop.

Best regards

[Redacted]

[Redacted]



[Redacted]

Disclaimer: "This message does not constitute a formal communication and the views expressed are purely those of the writer and may not in any circumstances be regarded as stating an official position of the European Commission."

From: Christian Vind (MFVM-DEP) [mailto:chvin@mfvm.dk]

Sent: Monday, January 25, 2016 2:00 PM

To:

Cc: Line Andersen (MFVM-DEP)

Subject: VS: Follow-up notes to the meeting 8th of January.

Dear [Redacted]

I have just tried to reach you by phone.

I would like to follow-up on my mail from last week and hope that you have considered our proposal of a technical workshop, if you still have questions to the policies or the scientific work there are built upon.

Please call back if possible, I am available the rest of the afternoon.

Regards,
Christian

+45 4131 8487

Fra: Christian Vind (MFVM-DEP)

Sendt: 19. januar 2016 12:36

Til:

Cc: Line Andersen (MFVM-DEP); Hans Peter Olsen; Sofus Rex (MFVM-DEP);

Sofus Rex (MFVM-DEP)

Emne: Follow-up notes to the meeting 8th of January.

Dear [Redacted]

Thank you for the very fruitful meeting the 8th of January.

To answer some of you question I have attached 4 follow-up notes on:

- A) The adjustment of the "harmony rules"
- B) The adjustment of prohibition on soil tillage
- C) The effect regarding statutory buffer strip
- D) On targeted nitrogen regulation.

On top of that, a number of research-papers lies behind the effects described in the notes. The Danish RBMPs are based on extensive research from Aarhus University and DHI. Below is a list of the key reports prepared leading up to the draft RBMPs as published in December 2021:

'The baseline report' is a technical report authored by the University of Aarhus. The report estimates the expected change in nitrogen load in the period 2013-2021 based on a 'frozen policy scenario'. In accordance with the planned changes to regulation, the University of Aarhus has published a revision of the original report.

The target load in the Danish coastal water bodies is a result of statistical and mechanistic modelling done by the University of Aarhus and DHI. The models are described in three reports: Part I – summary, Part II – mechanistic models, and Part III – statistical models. A set of minor revisions have been made to the original models, which are expected to be published during the spring.

All of the scientific reports behind the draft RBMPs is available via this link.

It is important to us, that we answer all your questions as detailed as required, and would therefore propose a technical workshop – either as a meeting in Bruxelles or Copenhagen or via video-link. If you are interested, we could invite some of the scientists to the talks as well. A possible date could be sometime in the last week of January (25. – 29. Of January), so that we hopefully can make sure that there are no unanswered questions left when we reach the meeting in the Nitrates committee late February.

You are also more than welcome to send written questions to the notes that we send the 7th of January and to the follow-up notes if that is more convenient for you with written questions and answers and please let us know if there are specific parts of the scientific documents that you would like translated.

Regards,
Christian Vind

Best regards

Christian Vind
| Landbrug og miljø
+45 41 31 84 87 | chvin@mfv.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfv@mfv.dk | www.mfv.dk

AKT 2130002 - DIB (S) - SV Meeting request from Danish authority on the Waterframework and Nitrates Direc...

To: [REDACTED]
Cc: Morten Boys Hansen (Naturerhvervstyrelsen (mobh@naturerhverv.dk); [REDACTED]; Jesper Wulff Pedersen (jwp@mfvn.dk), Søren Bisgaard (sorbis@um.dk), Helle Bach Rungø (helba@mfvn.dk); [REDACTED]; Sofus Rex (sofur@mfvn.dk), [REDACTED]; Marie Guldborg (magu@naturerhverv.dk)
Fra: Annette Schneider Nielsen (anschn@um.dk)
Titel: SV: Meeting request from Danish authority on the Waterframework and Nitrates Directives - Wednesday 6th January 2016
Sendt: 14-12-2015 18:55:23

Dear [REDACTED]
I am sorry about the confusion. After having consulted with Copenhagen, I can confirm: We would like BOTH 1) a meeting at technical level AND 2) a subsequent meeting at Director-level in January – preferably 6th of January as indicated.
Kind Regards
Annette Schneider

ANNETTE SCHNEIDER / ANSCHN@UM.DK
MILJØRÅD/ENVIRONMENT COUNSELLOR
DIRECT +3222330801

THE PERMANENT REPRESENTATION OF DENMARK TO THE EU
PERMANENT REPRESENTATION OF DENMARK TO THE EUROPEAN UNION / B-1040 BRUXELLES
PHONE +32 (2) 233 0811 / EU.UM.DK

Fra: [REDACTED]
Sendt: 14. december 2015 14:58
Til: Annette Schneider Nielsen
Cc: sofur@mfvn.dk; magu@naturerhverv.dk; [REDACTED]; mobh@naturerhverv.dk; [REDACTED]
Emne: FW: Meeting request from Danish authority on the Waterframework and Nitrates Directives - Wednesday 6th January 2016

Dear Annette,

I am a bit confused about this message.

I have last Friday and latest just couple of hours ago spoken with Sofus. There seemed to be an agreement that the director level meeting on this issue would be postponed for January, as it was considered by my hierarchy to be premature before certain level technical discussion has taken place.

Therefore, a technical level video conference has been agreed on. This was to be organised directly by the Ministry with Dg ENV counterparts and with AGRI participation. This video conference could take place on the condition that we receive an explanatory note from the Ministry. As far as I know, we have not yet received the note.

Could you kindly confirm my understanding?

Hilsen,
[REDACTED]
[REDACTED]


European Commission
[REDACTED]
[REDACTED]
[REDACTED]

Notice légale CE DG-AGRI:

Ce message exprime uniquement les points de vue de son auteur et ne saurait en aucun cas être considéré comme une position officielle de la Commission. Il est destiné uniquement à la personne à laquelle il est adressé et pourrait contenir des informations confidentielles. Si vous avez reçu ce message par erreur, merci de m'en avvertir le plus rapidement possible.

Disclaimer CE DG-AGRI:

This message represents solely the views of its author and can not in any circumstances be regarded as the official position of the Commission. It is intended solely for the person to whom it is addressed and may contain confidential information. If you have received this message in error, please notify me as soon as possible.

From: [REDACTED]
Sent: Monday, December 14, 2015 2:41 PM
To: [REDACTED]
Subject: FW: Meeting request from Danish authority on the Waterframework and Nitrates Directives - Wednesday 6th January 2016

Dear all, we should prepare this in this week, once you have the documents.



European Commission

Notice légale CE DG-AGRI:

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From: Annette Schneider Nielsen [
Sent: Monday, December 14, 2015 2:16 PM
To: [REDACTED]
Cc: [REDACTED] Søren Bisgaard
Subject: Meeting request from Danish authority on the Waterframework and Nitrates Directives - Wednesday 6th January 2016

Dear [REDACTED]

In continuation of previous contacts on this issue and our meeting with your Service in September on the Waterframework and Nitrates Directives our Deputy Permanent Secretary Anders Mikkelsen would like to request a second bilateral meeting with Director Josefine Loriz-Hoffmann on Wednesday the 6th of January 2016. – preferably at 12.00 or at 14.00.

The Danish Government is presently preparing the basis for a political agreement addressing improvement of the production conditions for the Food- and Agricultural business. The political agreement is expected to result in a new and more targeted way of regulating nitrates in Denmark in the future, expected to be in place in 2018. On a short term basis (2016-2018) it is generally expected to be possible to target measures to avoid deterioration locally, and on a long term basis (2019-2021) the initiatives – combined with the targeted regulation – are expected to ensure a gradual improvement of the aquatic environment.

The model to avoid deterioration in the period 2016-2018 is expected to include the following regulatory initiatives:

- Changes in national regulation of mandatory catch crops.
- Land lease schemes with cultivation restrictions.
- Subsidy schemes to establish wetlands, mini-wetlands and afforestation, ensuring establishment of additional catch crops.

A more detailed note on this will follow as soon as possible.

From our side the following will participate:

Deputy Permanent Secretary Anders MIKKELSEN
HoU' Sofus REX
HoU Christian VIND
HoU Lars KOLZE
Environment Councillor Annette SCHNEIDER and
Agricultural Attaché Søren BISGAARD

Kind Regards,

Annette Schneider

ANNETTE SCHNEIDER / ANSCHN@UM.DK
ENVIRONMENT COUNSELLOR
MOBILE +32 (0)478 78 24 52

THE PERMANENT REPRESENTATION OF DENMARK TO THE EU
PERMANENT REPRESENTATION OF DENMARK TO THE EUROPEAN UNION / B-1040 BRUXELLES
PHONE +32 (0)2 233 0801 / EU.UM.DK

Arkiv 2: 150002 - Bilags 0 - [REDACTED] Technical details regarding videoconference meeting (MFVM Id nr.: 2062778)

To: Helle Bach Rungø (helba@mfvm.dk)
Cc: Robert Busk (NaturErhvervstyrelsen (rbu@naturerhverv.dk), Anna-Mette Laumann Bech (NaturErhvervstyrelsen) (amb@naturerhverv.dk), ruskne@naturerhverv.dk (ruskne@naturerhverv.dk)
Fra: [REDACTED]
Titel: RE: Technical details regarding videoconference meeting
Sendt: 16-12-2015 10:22:33

Dear Helle,

Thank you for this information. This is perfect.

Best regards

[REDACTED]

From: Helle Bach Rungø [mailto:helba@mfvm.dk]
Sent: Wednesday, December 16, 2015 9:38 AM
To: [REDACTED]
Cc: ruskne@naturerhverv.dk; Robert Busk (NaturErhvervstyrelsen; Anne-Mette Laumann Bech (NaturErhvervstyrelsen)
Subject: Technical details regarding videoconference meeting (MFVM Id nr.: 2062778)

Dear [REDACTED]

Please find below the technical details regarding our videoconference meeting today the 16th. of December from 17:00 to 18:00:

- Call through "SIP address"(for SIP-compliant equipment): 70008@pdic.dk
- Alternatively:
- Call through IP-address: 83.151.154.76, press 1 followed by 70008 followed by ##

For further technical details please contact: Rusmira Knezevic (e-mail ruskne@naturerhverv.dk, phone 0045 6198 8613) or Robert Busk (e-mail rbu@naturerhverv.dk, phone 0045 4526 3635).

Best regards,

Helle Bach Rungø

Agriculture and Environment
+45 91 36 58 59 | helba@mfvm.dk

Ministry of Environment and Food of Denmark
Ministry Departement | Børgsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mfvm.dk

To: [REDACTED]
Fra: Helle Bach Rungø (helba@mfvm.dk)
Titel: Sv: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 15-12-2015 15:27:08

Dear [REDACTED]

I will get back to you as soon as possible with the below mentioned information.

Best regards,

Helle Bach Rungø
Agriculture and Environment
+45 91 36 58 59 | helba@mfvm.dk

Miljø- og Fødevarerministeriet
Departementet | Børgsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mfvm.dk

To: Helle Bach Rungø (helba@mfvm.dk)
Fra: [REDACTED]
Titel: RE: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 15-12-2015 14:54:47

Dear Helle,

In order to arrange the videoconference I would need technical information such as ISDN number and/or IP address, site to connect and technical contact details: Name , Phone, E-mail of a technical contact person of your site.

Thank you

With best regards



From: Christian Vind (MFVM-DEP) [mailto:chvin@mfvm.dk]
Sent: Tuesday, December 15, 2015 1:49 PM
To: [REDACTED]
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP); [REDACTED]
Subject: SV: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear [REDACTED]

Great, I can confirm that we are available for a videoconference tomorrow from 17:00 to 18:00.

Please coordinate the technical details regarding the set-up with Helle Bach Rungø.

Best regards,
Christian Vind

Fra: [REDACTED]
Sent: 15. december 2015 13:43
Til: Christian Vind (MFVM-DEP)
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP); [REDACTED]
Emne: RE: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear Christian Vind,

We would be available for a videoconference tomorrow, Wednesday 16 December, from 17:00 to 18:00. If this date and time is suitable for you, I will then follow up with the technical details to set-up the videoconference.

Best regards



The views expressed are purely those of the writer and may not in any circumstances be regarded as stating an official position of the European Commission. This message may contain personal and other confidential data that are entrusted to the recipients specified in the header of the message.

From: Christian Vind (MFVM-DEP) [mailto:chvin@mfvm.dk]
Sent: Tuesday, December 15, 2015 8:46 AM
To: [REDACTED]
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP)
Subject: VS: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear [REDACTED]

I have tried to contact you by phone but have not been successful.

Thus with reference to the enclosed notes on the future regulation of nitrates in Denmark, I would like to enquire whether it would be possible to set up a video conference meeting on Thursday the 17th of December, where we on a technical level can explain our solution and discuss any questions you may have regarding the notes. Our colleagues have already been in contact with [REDACTED] from DG Agri with this proposal, and they are willing to conduct such a meeting in collaboration with you at DG Envi. Please see attached correspondence (please note that Wednesday have changed to Thursday).

In reference to this we have through our permanent representation also proposed a bilateral meeting on the 6th of January 2016 at directors-level between our Deputy Permanent Secretary Anders Mikkelsen and Director Humberto Delgado-Rosa as a further follow up on the meeting we had the 27th. of November 2015 as well as on the basis of the more technical video-conference meeting we propose on Thursday.

We are fully aware of the tight schedule, but hope that you may appreciate the relevance of these meetings and thus be able to find the time.

Please do not hesitate to contact me or my colleague, Helle Bach Rungø, with questions both practical and otherwise.

Best regards

Christian Vind

Med venlig hilsen
Best regards

Christian Vind
| Landbrug og miljø
+45 41 31 84 87 | chvin@mfvn.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfvn@mfvn.dk | www.mfvn.dk

To: [REDACTED]

Cc: [REDACTED] Anders Mikkelsen (ami@mfvn.dk),
Christian Vind (chvin@mfvn.dk), Sofus
Rex (sorux@mfvn.dk), Olesen, Hans Peter (hapo@mst.dk), Lide Bagge Jensen (ldbj@mst.dk), Marie
Guldborg (magu@naturerhverv.dk), Louise Piester (DEP) (louj@mfvn.dk), Lars Kotze
(NaturErhvervstyrelsen (LAK@naturerhverv.dk), jakm@naturerhverv.dk (jakm@naturerhverv.dk), Mette
Lise Jensen (melje@nst.dk), Thomas Bruun Jessen (tbr@nst.dk), Jesper Wulff Pedersen (jwp@mfvn.dk)

Fra: Helle Bach Rungø (helba@mfvn.dk)

Titel: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015

Sendt: 14-12-2015 16:27:19

Dear [REDACTED]

Thank you, [REDACTED] for a very fruitful discussion at the bilateral meeting between the Commission and the Danish delegation on November 27th. And also thanks to DG Agri for a number of very constructive talks.

As background material for a technical discussion, which we are just about to set up with you, we hereby enclose:

- a note on a model for intermediate compensatory measures to avoid increased N emission
- a note on the future regulation of the loss of plant nutrients to the aquatic environment in Denmark

We hope that this material will clarify the key issues of the future regulation of nitrates in Denmark. We look forward to discussing the details of the notes with you, and will contact you shortly with regards to planning of a technical meeting later this week.

Best regards,

Helle Bach Rungø
Agriculture and Environment
+45 91 36 58 59 | helba@mfvn.dk

Ministry of Environment and Food of Denmark
Ministry Department | Børsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mfvn.dk

ART 210002 - BILAS 3 - RE: Follow up on bilateral meeting with the Commission on Nitrate Action Programme
To: Helle Bach Rungø (helba@mfvm.dk)
Fra: [REDACTED]
Titel: RE: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 15-12-2015 14:54:47

Dear Helle,

In order to arrange the videoconference I would need technical information such as ISDN number and/or IP address, site to connect and technical contact details: Name, Phone, E-mail of a technical contact person of your site.

Thank you

With best regards



From: Christian Vind (MFVM-DEP) [mailto:chvin@mfvm.dk]
Sent: Tuesday, December 15, 2015 1:49 PM
To: [REDACTED]
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP); [REDACTED]
Subject: SV: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear [REDACTED]

Great, I can confirm that we are available for a videoconference tomorrow from 17:00 to 18:00.

Please coordinate the technical details regarding the set-up with Helle Bach Rungø.

Best regards,
Christian Vind

Fra: [REDACTED]
Sendt: 15. december 2015 13:43
Til: Christian Vind (MFVM-DEP)
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP); [REDACTED]
Emne: RE: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear Christian Vind,

We would be available for a videoconference tomorrow, Wednesday 16 December, from 17:00 to 18:00. If this date and time is suitable for you, I will then follow up with the technical details to set-up the videoconference.

Best regards



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From: Christian Vind (MFVM-DEP) [mailto:chvin@mfvm.dk]
Sent: Tuesday, December 15, 2015 8:46 AM
To: [REDACTED]
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP)
Subject: VS: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear [REDACTED]

I have tried to contact you by phone but have not been successful.

Thus with reference to the enclosed notes on the future regulation of nitrates in Denmark, I would like to enquire whether it would be possible to set up a video conference meeting on Thursday the 17th of December, where we on a technical level can explain our solution and discuss any questions you may have regarding the notes. Our colleagues have already been in contact with Tarja Tainen from DG Agri with this proposal, and they are willing to conduct such a meeting in collaboration with you at DG Envi. Please see attached correspondence (please note that Wednesday have changed to Thursday).

In reference to this we have through our permanent representation also proposed a bilateral meeting on the 6th of January 2016 at directors-level between our Deputy Permanent Secretary Anders Mikkelsen and Director Humberto Delgado-Rosa as a further follow up on the meeting we had the 27th. of November 2015 as well as on the basis of the more technical video-conference meeting we propose on Thursday.

We are fully aware of the tight schedule, but hope that you may appreciate the relevance of these meetings and thus be able to find the time.

Please do not hesitate to contact me or my colleague, Helle Bach Rungø, with questions both practical and otherwise.

Best regards

Christian Vind

Med venlig hilsen
Best regards

Christian Vind
| Landbrug og miljø
+45 41 31 84 87 | chvin@mfvn.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfvn@mfvn.dk | www.mfvn.dk

Til:

Cc:

[REDACTED] Anders Mikkelsen (ami@mfvn.dk),
[REDACTED] Christian Vind (chvin@mfvn.dk), Sofus
Rex (sorex@mfvn.dk), Olsen, Hans Peter (hapol@msl.dk), Lide Bagge Jensen (lidsj@mst.dk), Marie
Guldborg (magu@naturerhverv.dk), Louise Piester (DEP) (louj@fvn.dk), Lars Koize
(NaturErhvervstyrelsen (LAK@naturerhverv.dk), jakm@naturerhverv.dk (jakm@naturerhverv.dk), Mette
Lise Jensen (metje@nst.dk), Thomas Bruun Jessen (tbr@nst.dk), Jesper Wulff Pedersen (jwp@mfvn.dk)
Fra: Helle Bach Rungø (helba@mfvn.dk)

Titel: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015

Sendt: 14-12-2015 16:27:19

Dear [REDACTED]

Thank you, [REDACTED] for a very fruitful discussion at the bilateral meeting between the Commission and the Danish delegation on November 27th. And also thanks to DG Agri for a number of very constructive talks.

As background material for a technical discussion, which we are just about to set up with you, we hereby enclose:

- a note on a model for intermediate compensatory measures to avoid increased N emission
- a note on the future regulation of the loss of plant nutrients to the aquatic environment in Denmark

We hope that this material will clarify the key issues of the future regulation of nitrates in Denmark. We look forward to discussing the details of the notes with you, and will contact you shortly with regards to planning of a technical meeting later this week.

Best regards,

Helle Bach Rungø
Agriculture and Environment
+45 91 36 58 59 | helba@mfvn.dk

Ministry of Environment and Food of Denmark
Ministry Department | Børsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mim.dk

Til: [redacted]
Cc: Line Andersen (land@mfvn.dk), Jakob Ruskjær Nygård (jam@mfvn.dk), Lidde Bagge Jensen (lidbj@mst.dk) [redacted]
Fra: Christian Vind (chvin@mfvn.dk)
Titel: VS: Follow-up notes to the meeting 8th of January.
Sendt: 02-02-2016 09:04:53

Dear [redacted]

We are looking forward to the workshop on Friday. In order to bring to right experts, we would very much appreciate if you could sent us your questions beforehand or point to the themes or papers you want elaborated in addition to the "baseline rapport".

Since we have sent you quite a few notes and papers, we have asked the permanent representation of Denmark to bring you a number of hard copies of the material. You should receive them today.

Best regards,
Christian

Fra: Christian Vind (MFVM-DEP)
Sendt: 1. februar 2016 08:59
Til: [redacted]
Cc: Line Andersen (MFVM-DEP); [redacted] Lidde Bagge Jensen
Emne: SV: Follow-up notes to the meeting 8th of January.

Dear [redacted]

Thank you for your email. We would prefer an actual meeting, and are happy to visit you in the DG environment premises.

We will be prepared to elaborate on "The baseline rapport" and of course any other questions you might have.

A have attached 3 new notes to this mail, which are the last notes, to follow up on our previous discussions.

- A) A note on the content of the new Danish Nitrate Plan
- B) A note on measures ensuring the protection of groundwater
- C) A note on nitrogen effects from extra RDP funds for the period 2017-2021 to additional collective Nitrogen-reducing measures

We will get back to you, with the names of those who will attend from our side.

Best regards,
Christian

Med venlig hilsen

Christian Vind
Kontorchef | Landbrug og miljø
+45 41 31 84 87 | chvin@mfvn.dk

Miljø- og Fødevarerministeriet
Departementet | Slotsholmsgade 12, 1216 København K | Tlf. +45 33 92 33 01 | mfvn@mfvn.dk | www.mfvn.dk

Fra: [redacted]
Sendt: 29. januar 2016 17:07
Til: Christian Vind (MFVM-DEP)
Cc: Line Andersen (MFVM-DEP); [redacted]
Emne: RE: Follow-up notes to the meeting 8th of January.

Dear Christian Vind,

Following up on [redacted] email, I confirm that the workshop can take on Friday 5 February, from 10:00 to 13:00. We could either arrange for the workshop to take place here in the DG environment premises or via videoconference. Which option would suits you the best?

From our side we would be interested in learning about 'The baseline report', and in particular the expected nitrogen load changes in both in the 'frozen policy scenario' and in scenario including the planned changes to the Danish regulation. The workshop would be also the occasion to discuss the technical information underpinning the follow-up notes sent on 19 January.

For DG ENV, the workshop will be attended by [redacted] might be able to join.

Best regards,

[redacted]
[redacted]

The views expressed are purely those of the writer and may not in any circumstances be regarded as stating an official position of the European Commission. This message may contain personal and other confidential data that are entrusted to the recipients specified in the header of the message.

From: Christian Vind (MFVM-DEP) [mailto:chvin@mfvm.dk]
Sent: Friday, January 29, 2016 8:29 AM
To: [REDACTED]
Cc: Line Andersen (MFVM-DEP); [REDACTED]
Subject: SV: Follow-up notes to the meeting 8th of January.

Dear [REDACTED]

Thank you very much. We are looking forward to advance the dialog and answer your questions next Friday.

We will discuss the details with [REDACTED]

Best regards,
Christian Vind

Fra: [REDACTED]
Sent: 28. januar 2016 17:25
Til: Christian Vind (MFVM-DEP)
Cc: Line Andersen (MFVM-DEP); [REDACTED]
Emne: RE: Follow-up notes to the meeting 8th of January.

Dear Christian Vind,

Thank you for your message and for sharing further documents related to nitrogen regulation in Denmark, which required further assessment and internal discussion during the last week. In addition I was taken in meetings most of the past few days.

Following your proposal, and as conveyed by my Director in the phone call with Deputy Permanent Secretary Mikkelsen, my colleagues would be available for a technical workshop to further understand elements concerning the documents you have sent (e.g. follow-up notes and the baseline report and its revision).

We are trying to find a room for Friday 5 February, from 10:00 to 13:00.

My colleague [REDACTED] (in copy) will contact you soon to define the details of the workshop.

Best regards

[REDACTED]

[REDACTED]

[REDACTED]

From: Christian Vind (MFVM-DEP) [mailto:chvin@mfvm.dk]
Sent: Monday, January 25, 2016 2:00 PM
To: [REDACTED]
Cc: Line Andersen (MFVM-DEP)
Subject: VS: Follow-up notes to the meeting 8th of January.

Dear [REDACTED]

I have just tried to reach you by phone.

I would like to follow-up on my mail from last week and hope that you have considered our proposal of a technical workshop, if you still have questions to the policies or the scientific work there are built upon.

Please call back if possible, I am available the rest of the afternoon.

Regards,
Christian

+45 4131 8487

Fra: Christian Vind (MFVM-DEP)
Sendt: 19. januar 2016 12:36
Til: [REDACTED]
Cc: Line Andersen (MFVM-DEP); Hans Peter Olsen; Sofus Rex (MFVM-DEP); [REDACTED]
Sofus Rex (MFVM-DEP)
Emne: Follow-up notes to the meeting 8th of January.

Dear [REDACTED]

Thank you for the very fruitful meeting the 8th of January.

To answer some of you question I have attached 4 follow-up notes on:

- A) The adjustment of the "harmony rules"
- B) The adjustment of prohibition on soil tillage
- C) The effect regarding statutory buffer strip
- D) On targeted nitrogen regulation.

On top of that, a number of research-paper lies behind the effects described in the notes. The Danish RBMPs are based on extensive research from Aarhus University and DHI. Below is a list of the key rapports prepared leading up to the draft RBMPs as published in December 2021:

'The baseline report' is a technical report authored by the University of Aarhus. The report estimates the expected change in nitrogen load in the period 2013-2021 based on a 'frozen policy scenario'. In accordance with the planned changes to regulation, the University of Aarhus has published a revision of the original report.

The target load in the Danish coastal water bodies is a result of statistical and mechanistic modelling done by the University of Aarhus and DHI. The models are described in three reports: Part I – summary, Part II – mechanistic models, and Part III – statistical models. A set of minor revisions have been made to the original models, which are expected to be published during the spring.

All of the scientific reports behind the draft RBMPs is available via this link.

It is important to us, that we answer all you questions as detailed as required, and would therefor propose a technical workshop – either as a meeting I Bruxelles or Copenhagen or via video-link. If you are interested, we could invited some of the scientist to the talks as well. A possible date could be sometime I the last week of January (25. – 29. Of January), so that we hopefully can make sure that there are no unanswered questions left when we reach the meeting in the Nitrates committee late February.

You are also more than welcome to send written questions to the notes that we send the 7th of January and to the follow-up notes if that is more convenient for you with written questions and answers and please let us know if there are specific parts of the scientific documents that you would like translated.

Regards,
Christian Vind

Best regards

Christian Vind
| Landbrug og miljø
+45 41 31 84 87 | chvin@mfvm.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfvm@mfvm.dk | www.mfvm.dk

To: [redacted]
Cc: Line Andersen (land@mfv.dk), Lide Bagge Jensen (lidoj@mst.dk), [redacted]
Fra: Christian Vind (chvin@mfv.dk)
Titel: SV: Follow-up notes to the meeting 8th of January.
Sendt: 01-02-2016 08:58:58
Bilag: Bilag 1 Note on the Danish NHP 2016.docx; Bilag 2 - Note on groundwater protection when lifting the reduced general fertilization standards fo.docx; Bilag 3 Follow-up note on expected N-reduction from RDP funds to collective N-reducing measures.docx;

Dear [redacted]

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Med venlig hilsen

Christian Vind
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Miljø- og Fødevarerministeriet
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Fra: [redacted]
Sendt: 29. januar 2016 17:04
Til: Christian Vind (MFVM-DEP)
Cc: Line Andersen (MFVM-DEP); [redacted]
Emne: RE: Follow-up notes to the meeting 8th of January.

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European Commission
[redacted]
[redacted]

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[REDACTED]


European Commission

[REDACTED]

Disclaimer: "This message does not constitute a formal communication and the views expressed are purely those of the writer and may not in any circumstances be regarded as stating an official position of the European Commission."

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Sendt: 19. januar 2016 12:36

Til: [REDACTED]

Cc: Line Andersen (MFVM-DEP); Hans Peter Olsen; Sofus Rex (MFVM-DEP); [REDACTED]

[REDACTED] Sofus Rex (MFVM-DEP)

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**Ministry of Environment
and Food of Denmark**
Environmental
Protection Agency

Danish EPA, Industry and
Agriculture
J.nr. 001-14111
Ref. lidbj/phof (NAER)
18 January 2016

Revision of the Danish Nitrate Action Programme, 2016

EU Member States must, in accordance with the Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC) (hereafter referred to as the Nitrates Directive), prepare a nitrates action programme in order to achieve the objectives of the directive to reduce water pollution caused by nitrates from agricultural sources and to prevent further pollution thereof. At least every four years, the Member States must in accordance with the Nitrates Directive review and if necessary revise their action programme, including any additional measures taken pursuant to paragraph 5.

In this note, an outline is presented of the expected contents of the Danish Nitrates Action Programme as of 1 August 2016 and onwards as well as a short description of the specific changes made in the Danish Nitrates Action Programme following a revision of the programme.

1. The political agreement on a Food and Agricultural package

On 22 December 2015, the Danish government and supporting political parties in the Danish Parliament reached an agreement on a Food and Agricultural package. The agreement includes a diverse package of measures to make a shift in the way environmental regulation of the agricultural sector is carried out, from a general regulation to a targeted approach. The aim is to improve the ability of the food and agricultural industry to increase primary production and exports, as well as to contribute to creating growth and jobs in the entire country of Denmark – in due interaction with the protection of nature and the environment. A central element in the agreement is to lift the reduction of nitrogen application standards for farming, which are reduced by approximately 20% compared to the economic optimal level today. The removal of the reduction of the nitrogen application standards is scheduled to take place stepwise by two thirds in spring 2016 during the current crop season 2015/16 and by the remaining one third in the following crop season 2016/17. As the nitrogen application standards are an element in the implementation of the Nitrates Directive, this change in regulation presupposes a revision of the Danish Nitrates Action Programme.

2. The current Danish Nitrates Action Programme

According to the Nitrates Directive, Member States shall be exempt from the obligation to identify specific vulnerable zones, if they establish and apply action programmes referred to in art. 5 in the directive, in accordance with this Directive throughout their entire national territory. Denmark has established and applied action programmes for the whole territory.

The implementation of the Nitrates Directive consists of the following measures for the whole territory, with reference to art. 5, 4 in the directive:

- the measures in Annex III and
- those measures, which we have prescribed in the code of good agricultural practice, except those which have been superseded by the measures of Annex III.

Denmark has implemented the Nitrates Directive mainly via following current orders and acts:

1. Order on commercial livestock, livestock manure, silage, etc. no. 1318 (26/11/15)
2. Act on farms' use of fertilizer and plant cover no. 500 (12/05/13) and subsequent changes

3. Order on farms' use of fertilizer in the planning period 2015/2016 no. 929 (29/07/15)
4. Order on plant cover and cultivation-related measures no. 1777 (16/12/15)

In general, Denmark is aiming to ensure a comprehensive Nitrates Action Programme, covering the relevant elements. The Nitrates Action Programme has an emphasis on efficient measures and high standards for registration of information, control and monitoring systems.

3. Preliminary revisions of the Nitrates Action Programme in 2016[-2020]

Denmark will be revising the Nitrates Action Programme in 2016. The main elements being revised as of 1 August 2016 are expected to be as follows:

- *Lifting of the reduced nitrogen application standards (Annex III, 1,3)*

In accordance with the political agreement on the food and agricultural package (see above), the lifting of the reduction of the nitrogen application standards is scheduled to take place stepwise by two thirds in spring 2016 during the current crop season 2015/16 and by the remaining one third in the following crop season 2016/17.

In order to avoid an increase in nitrate leaching, compensatory measures will be established, consisting of the following:

- Changes in regulation of establishment of mandatory catch crops and use of other areas as alternatives to the catch crops
- Additional establishment of mini-wetlands, wetlands
- Afforestation
- Targeted catch crop scheme

These measures are not to be considered as elements, directly implementing the Nitrates Directive but they will ensure the necessary reduction of nitrate leaching in accordance with the directive.

- *Removal of the requirement for overflow alarms on certain storage vessels*

The regulation regarding requirement for alarms on certain storage vessels is removed from the Nitrates Action Programme, but will continue to be maintained as an obligatory requirement for the farmers. The regulation will therefore be upheld at national scale but will no longer be covered by cross compliance cf. REG (EU) 1306/2013. The reason for this change is that the specific requirement has been regarded as disproportional in relation to the potential size of sanctions on direct payment that an infringement may result in.

- *Further changes in the Order on commercial livestock, livestock manure, silage, etc. 1318 (26/11/15)*

These changes may concern measures implementing the Nitrates Directive, but are expected to be of minor environmental impact.

4. Subsequent revisions of the Nitrates Action Programme on a longer term

Due to the elements of the political agreement on the Food and Agricultural package as mentioned above, further changes of the regulation of nitrates from agriculture are expected within the period 2016-2020. These changes are not part of the current revision of the Nitrates Action Programme and will be part of subsequent revisions.

2017

Harmony rules and altered phosphorus regulation

Coming into effect from 2017, the Danish government wishes to align the "harmony rules" for slaughter pigs, to ensure that the requirement is aligned with the requirement of the Nitrates Directive that specifies the amount of livestock manure per hectare to 170 kg N, corresponding to 1.7 LU/ha. This means that the harmony rules limit for holdings producing slaughter pigs will be lifted from 1.4 LU/ha to 1.7 LU/ha.

Due to this alignment of the harmony rules, a new regulation addressing phosphorous will be introduced.

The current limit at 1.4 LU/ha also implies for fur animals and poultry, since the manure from these animal types contain a relatively large amount of phosphorus. However, if a new regulation of phosphorus can handle this challenge, the harmony rules for these types of animals may also be aligned.

New and more emission based regulation of livestock holdings

A new regulation of livestock holdings will entail flexibility for the farmer based on the maximum production area in the stables. For the benefit of simplification of the procedure for both farmers and municipalities, the current environmental approval for livestock holdings will only cover the housing system, storage facility etc., whereas the spreading of manure from the holding will be regulated by general rules and registrations in the fertilizer accounts.

The regulation of livestock holdings is expected to be introduced in 2017, at the same time as changing the harmony rules (see above).

A new regulation of livestock holdings will ensure the sufficient and correct implementation of the EU directives. The regulation will be based on the actual emissions from each holding.

2018

Targeted regulation of nitrogen

The future targeted regulation of nitrogen is expected to be implemented from 2018 and onwards. The regulation will be mandatory for all farmers. The regulation will be based on four main principles:

1. The leaching permit/limit in each coastal water body is differentiated geographically in order to meet the nitrogen target in each coastal water body (in total 90 coastal water bodies in Denmark).
2. Each farm is appointed a leaching permit/limit to the water environment.
3. Each farmer is given flexibility in the choice of instruments (e.g. catch crops, buffer strips, reduced nitrogen application etc.) in order to comply with the leaching permit.
4. The farmers will be compensated for the costs involved with the compliance of the reduced leaching permit.

The scheme will be targeted to areas with specific needs to reduce nitrogen leaching to the aquatic environment including ground water.

5. Implementation of Nitrates Directive by mandatory measures in the Nitrates Action Programme

The core of the Danish Nitrates Action Programme will be maintained by ensuring that all key measures corresponding to the specific requirements in the directive are in place, as shown in table 1. The measures are described below in general terms with reference pursuant to each specific littera in Annex II and III of the Nitrates Directive respectively.

Table 1. Overview DK Nitrates Action Programme 1 August 2016 onwards. National measures described in general terms with reference to littera in Annex II and III of the Nitrates Directive.

Nitrates Directive	National measures	
91/676/EEC	Order on commercial livestock, livestock manure, silage, etc. (OO) (Act on environmental approval etc. of livestock holdings/Act on environment/Act on Farms use of fertilizer and plant cover)	Order on plant cover and cultivation (OP) Order on the agricultural use of fertilizer (OF) (Act on Farms use of fertilizer and plant cover)
Annex II, A, 1)	In the period from harvest, though no later than 1 October, to 1 February, liquid manure or digestate from vegetable biomass may not be applied - with exemptions.	
Annex II, A, 2)	Manure, degassed plant biomass, and mineral fertilizer must not be applied on sloping areas.	
Annex II, A, 3)	Manure, digestate from plant biomass, silage effluent, residual water and mineral fertilizer	

Nitrates Directive	National measures	
	must not be applied in a manner with risk of run-off, including water-saturated, flooded, frozen or snow-covered soil.	
Annex II, A, 4)	Manure, digestate from plant biomass, silage effluent, residual water and mineral fertilizer must not be applied 2 m from water courses.	
Annex II, A, 5)	<p>Stables, stalls, etc. shall be designed in such a way that groundwater and surface water is not polluted.</p> <p>Capacity of storage facilities for manure must be adequate (specified). Adequate storage capacity may be satisfied by storage on other property or delivery to the biogas plant, manure treatment plant or manure storage facility.</p> <p>Solid manure must be stored in accordance with the correct provisions. When storing manure it must be ensured that surface water from the surrounding areas cannot seep into the manure storage. Compost with a dry matter content of at least 30% may be stored in the field if complying with certain requirements. Manure stored in the field, deep litter and processed manure, compost with a dry matter percentage greater than or equal to 12 must be covered with waterproof material.</p> <p>Silage must be stored in a silage storage facility or wrapped in waterproof material. Silage effluent must be discharged through purpose-designed drainage.</p> <p>Storage vessels for liquid manure, silage effluent, digestate from vegetable biomass and residual water must be constructed of materials which are resistant, impermeable to moisture. The vessels must be dimensioned in relation to capacity, so that they can withstand the influence, including from stirring, covering and emptying. Storage vessels for liquid manure, which is located in a risk area and close to water must be equipped with tamper-resistant barrier. Drains from stables/stalls, manure yards, silage stocks, cesspools, and pump wells shall be run through impermeable closed pipes and shall lead to liquid manure containers.</p>	
Annex II, A, 6)	Application of liquid manure and degassed plant biomass may only be carried out by means of trailing hoses, trailing foot/shoe applicators or by injection.	
Annex II, B, 7)		Rules on field and fertilizer planning
Annex II, B, 8)		<p>General requirement for 240,000 ha mandatory catch crops is maintained.</p> <p>(In the comments to the draft Act amending the Act on agricultural use of fertilizers and plant cover (the later Act no. 576 of 4 May 2015) is stated: "Plant cover, including catch crops, is particularly suited to take up nitrogen that would otherwise leach into the water environment. As part of the measures to achieve the objectives of the Nitrates Directive is therefore established requirements that agricultural enterprises with crop or livestock or combinations thereof, which have an annual taxable turnover exceeding 50,000 DKR from crops or livestock, or combinations thereof, and has a total area of 10 hectares or more in accordance with § 3 of the Act, shall establish 240,000 hectares of crops nationwide.")</p>
Annex II, B, 9)		Preparation of fertilizer accounts
Annex II, B, 10)		Need for irrigation is included when calculating nitrogen fertilizer standards
Annex III, 1.1	See Annex II, A, 1) and 5)	
Annex III, 1.2	See Annex II, A, 5)	
Annex III, 1.3	The nutrients in manure, digestate from	The yearly amount of nitrogen permitted at farm level is

Nitrates Directive	National measures
	<p>vegetable biomass, silage effluent and residual water may only be applied to crops with a nitrogen standard or a normative standard for phosphorus and potassium.</p> <p>calculated taking into account the characteristics of the area and is based on a balance between the foreseeable nitrogen requirement of the crops and the nitrogen supply to the crops from the soil and from fertilization. The optimal relationship between the nitrogen requirements of the crops and nitrogen supply is set every year on basis of trials. This is done for four different soil types and for irrigated sandy soil. In addition, the relationship between prices for nitrogen and crops is taken into account, and the optimal fertilization level is calculated. Farmers are allowed to fertilize according to an optimal level, i.e. up to the economically optimal nitrogen quotas.</p> <p>Due to the varying abilities to retain nutrients, different soil types are divided into four categories with different nitrogen standards for the same crop. Irrigation is taken into consideration by the authorities when the specific standard is set and is only possible on sandy soil. In general the standard is increased when irrigation is possible.</p> <p>To irrigate the farmer needs a permission, which is given by the municipality. At the inspection, the permission to irrigate is checked. Irrigation is seldom used in Denmark, though. On the basis of the composition and distribution of crops and the soil and crop-specific nitrogen standards (in total about 276 different standards), the nitrogen quota for each farm is calculated</p> <p>The nitrogen supply to the crops from the soil is taken into account in several ways (annex III.1.3.c (ii)). Different amounts of nitrogen residues remain after the harvest of a crop. This is taken into account, when the standard of the following crop is stipulated. The individual standards are differentiated with regard to the residual effect of the pre-crop, which has to be withdrawn from the crop's standard the following year.</p> <p>Under the principle of having a balance between the uptake of nitrogen of the plants and the nitrogen supply the farm nitrogen quota is adjusted every year according to the actual amount of plant available nitrogen in the soil (annex III.1.3.b and annex III.1.3.c (ii)), called "the nitrogen prognosis". Due to yearly variations in temperature and extent of rainfalls in the wintertime, there are differences in the prognosis for nitrogen from one year to another.</p>
Annex III, 2, 2a, 2b.	<p>The total quantity of manure and degassed plant biomass applied on an agricultural holding shall not exceed an amount corresponding to 1.4 livestock units per hectare per planning period. Manure produced on agricultural holdings with cattle, sheep, or goats may be applied in quantities corresponding to 1.7 livestock units per hectare per planning period.</p> <p>On agricultural holdings where at least 2/3 of the livestock are cattle, manure and degassed plant biomass may be applied in quantities corresponding to 2.3 livestock units per hectare per planning period when in compliance with certain conditions.</p> <p>A maximum of 170 kg N per hectare per planning period of manure and degassed plant biomass may be applied on agricultural holdings. The quantities of manure applied to land as well as area for spreading manure (harmony area) are calculated on the basis of further specified methods.</p> <p>If an agricultural holding has greater quantities of manure available, including manure received from other farms, than what can be applied to</p>

Nitrates Directive	National measures	
	spreading area, agreements shall ensure that excess manure is disposed to/for by specified solutions. The operator must be able to document compliance with the harmony rules.	

Ministry of Environment and Food of Denmark

Danish Nature Agency/Danish AgriFish Agency

J.nr. 2015-6878

Date: 19 January 2016

Note

On groundwater protection when lifting the reduced general fertilization standards for nitrogen to the level of economic optimum

The Danish government has reached a political agreement addressing a need for improvement of the production conditions for the food and agricultural sector. The political agreement includes a new and more targeted way of future nitrates regulation in Denmark that will be in place in 2018. A key element in the political agreement is lifting the reduced general fertilization standards for nitrogen to the level of economic optimum.

The current general fertilization standards for nitrogen and the reduction hereof to a level below economic optimum is part of Denmark's implementation of the Nitrates Directive and thereby also Denmark's implementation of the Water Framework Directive.

Lifting the reduced standards to the economic optimum level will result in increased losses of nitrogen to the aquatic environment including groundwater. Compensatory measures will be implemented in order to counter the increased loss of nitrogen.

Thus, a new targeted regulation of nitrogen will be implemented from 2018 onwards. The regulation will ensure the protection of the aquatic environment including groundwater.

In the meantime, two initiatives will be initiated:

Changes in national regulation will be implemented limiting the farmer's current flexibility in using EFA areas as an alternative to the national requirement of the sowing of catch crops. This will increase the effect of the national requirement of 240.000 ha of catch crops, as more catch crops will be sowed. These changes do not concern the regulation of the EFA areas as such.

The changes will result in a combination of voluntary buffer strips and catch crops, depending on the specific choices of farmers, with a significant effect on N-leaching. For instance, 70.000 hectares additional EFA catch crops and the maintaining of 4.000 hectares additional buffer strips that would otherwise be removed.

Mainly additional catch crops will provide a reduction of nitrogen loss to groundwater. See Note on a model for intermediate compensatory measures to avoid increased N emission (10 December 2015).

In addition, a voluntary targeted catch crop scheme will be instigated from 2017 resulting in extra catch crops (on top of the national mandatory catch crops). The need and possibility for compensating measures already in 2016 are investigated further. The scheme will target areas

with a specific need for the reduction of nitrogen leaching to the aquatic environment including groundwater. The scheme is expected to be implemented within the rules of de minimis.

In order to implement the political agreement reached by the government on 22 December 2015, initiatives have been taken as follows:

Firstly, the scientific basis for assessing the specific need for compensatory measures in terms of extra catch crops has been established. The project will link results acquired from the national nitrogen model (nitrogen leaching from the root zone when lifting the reduced general fertilization standards for nitrogen to the level of economic optimum) to individual groundwater bodies, and the expected long term increase in the concentration of nitrates will be calculated for each groundwater body. The results will be compared to the status of the groundwater bodies and a possible trend in groundwater nitrates concentration. Moreover, analyses of scenarios will be undertaken in order to determine the need for compensatory measures in specific geographical areas in order to avoid groundwater deterioration and reverse any significant and sustained upward trend in nitrates concentration. The project is carried out by the Geological Survey of Denmark and Greenland which has developed the national nitrogen model. The project is will be completed in June 2016.

Secondly, with the political agreement the government has so far allocated 152 million DKK in 2016-18 for a voluntary targeted catch crop scheme resulting in extra catch crops in order to avoid deterioration of the aquatic environment including groundwater. The need for funds in regard to protection of groundwater is based on a preliminary assessment that there will be a need for compensatory measures equivalent to the increased leaching of nitrogen in geographical areas related to groundwater bodies at risk, i.e. the groundwater quality standard for nitrate (75%) is close to being exceeded or a significant and sustained upward trend in the nitrates concentration has been identified above 75% of the quality standard. Additional funds could be allocated, if needed.



Ministry of Environment and Food of Denmark
The Danish AgriFish Agency and The Danish Nature Agency
Date: 27 January 2016

Follow-up note.

Prospects of ensuring the expected nitrogen effects from extra RDP funds for the period 2017-2021 to additional collective Nitrogen-reducing measures

The Danish government has decided to upscale funds allocated to collective nitrogen (N)-reducing measures in Denmark from the Rural Development Programme (RDP) for the period 2017-2021 as part of the effort to decrease the loss of N to the aquatic environment in Denmark. On average, an extra 100 mio. DKK yearly is assigned to additional restoration of natural wetlands, 35 mio. DKK yearly is reserved for afforestation measures, and 97,5 mio. DKK yearly is earmarked to constructed mini-wetlands. This allocation of extra funds is based on past experiences, e.g uptake by farmers, estimates from SEGES¹ and dialogue with the Danish municipalities.

The table below shows the calculated N-effect (reduced loss of N) as a result of the upscaling of collective N-reducing measures in Denmark for the RDP period 2017-2021² as well as the financial frame. These additional measures come on top of already planned collective RDP N-reducing measures, which contribute with an N-effect of 1300 tonnes N in 2021.

Table 1. Reduced loss of nitrogen from additional collective N-reducing measures during the RDP-period 2017-2021. Accumulated tonnes N /year.

	2017	2018	2019	2020	2021
Wetlands	77,0	154,0	231,0	308,0	385,0
Afforestation	30,1	60,2	90,3	120,4	150,5
Constructed mini-wetlands	0,0	114,5	376,3	638,1	899,9
Total N-reduction pr. year	107,1	328,7	697,6	1066,5	1435,4
<i>Yearly financial frame for the three collective measures, DKK. Million</i>					
	135	205	295	295	295
Accumulated financial frame	135	340	635	930	1.225

Note: Compared to the figures in table 2 in the previously forwarded note of 10 December 2015 the figures have been accumulated.

The wetland measure

The environmental effects of reclaimed wetlands are well documented,

¹ SEGES is the newly amalgamated Knowledge Centre for Agriculture and the Danish Pig Research Centre under the Danish Agriculture & Food Council.

² In order to align with the timeframe of the Danish implementation of the river basin management plans (2015-2021) the budget period for the N-reducing measures and RDP funds includes 2021, although year 2021 will be part of the next LDP period (2021-2027). The river basin management plans are part of the Danish obligation in the implementation of the Water Framework Directive.

including the N-effects³. A wetland reduces loss of N from agricultural fields as well as the emission of greenhouse gasses and establishes new nature, thus creating a positive impact on biodiversity.

The efficiency of N removal in wetlands may vary considerable and is foremost attributed to the size of the nutrient load, as well as the hydrological characteristics of the wetlands – especially the watercourse running through the wetland. It is ensured that wetlands and other initiatives do not conflict and “compete” for the same N by ensuring a correct geographical location for the measures. Furthermore, a monitoring programme has been set-up to supervise effects from finalized wetland projects.

Reclamation of natural wetlands was part of the recent RDP period in Denmark and continues to be implemented from 2016 with the second cycle of the river basin management plans. The experiences gained from the wetland measure under the former RDP- period show that wetlands are effective in N-reduction and that the measure has a good uptake by farmers. During the last RDP period applications for the wetland measure have exceeded the money reserved for it in the programme. Therefore, it is expected that the extra funds allocated to the wetland measure in the next RDP period will be used and applied for.

Participation is voluntary, but under the wetland measure, Danish farmers and municipalities are guaranteed a 100 percent refund of their expenses. The farmer can chose whether to sell his land to the Ministry of Environment and Food, be compensated by another piece of land, or he can obtain 20 years of compensation for his loss of income from the land. The farmer usually has no obligations in maintaining the wetland after it is established. The condition of the wetland is registered on the farm and is notified at the Danish Land Registration. The condition is therefore permanent as is the N effect.

The farmers’ incitement for participating in the wetland measure is that there is usually no income loss involved. Most of the areas suitable for wetlands are usually the least suitable for farming, often difficult to manage because they are low-lying areas with risk of flooding. It is in addition often possible for the farmers to obtain better arable land in connection with land consolidation. In addition, the wetland measure can give the farmer better hunting opportunities and some recreational values on his farm. It is therefore expected, that farmers will continue to be interested in participating in wetland projects.

In the coming years, the Ministry of Environment and Food is planning to launch new initiatives in order to facilitate the wetland measure further, e.g. establishing a mobile consulting team. Furthermore, the Ministry is considering entering a partnership with the major Danish farmer associations to secure a commitment from the farmers to

³ “Virkemidler til realisering af 2. generations vandplaner og målrettet areal regulering”
http://pure.au.dk/portal/files/84646400/Virkemiddelkatalog_web.pdf

participate in the wetland measure. Also, a seminar on how to facilitate the wetland measure is held by late January 2016.

The potential for the wetland measure is in place, and the Ministry of Environment and Food will point out possible areas for projects in the river basin management plans. The allocation of extra funds under the RDP for the period 2017-2021 to the wetland measure will therefore reduce the loss of N to the aquatic environment. The effect is linearly increased as the financial framework is increased, since the potential exists and the incentives for participation in the projects are present.

The afforestation measure

The afforestation measure helps to promote biodiversity and to increase the area with forest in Denmark. The focus of the measure is the protection of water resources, e.g. reduction of nutrients and binding of CO₂ in the soil.

Subsidies are given to the establishment of new forest. The measure is open for private landowners who may apply for the establishment of forest on existing agricultural land. Often, support is granted to the establishment of hardwood forests and a typical afforestation project covers app. 7 hectare and includes fencing surrounding the planting and establishment without deep plowing and the use of pesticides.

The adopted budget of the measure (annually 35 mio. DKK) is expected to result in the establishment of about 1,000 hectares of new forest per year. This corresponds to the commitment area for the private afforestation measure in 2015 and the existing measure to private afforestation seems to be an attractive tool for the farmers to convert agricultural land into new forest. Under the new measure the economic incentives are improved in the designated areas by giving the farmer the possibility of keeping up direct payment on the area for afforestation. Therefore, there is reason to expect that the level of commitment area from 2015 can be maintained.

The new afforestation measure will be simplified and more transparent for the applicant. With the new measure, payments are gathered in one investment rate, paid immediately after planting. The economic uncertainty is therefore considerably reduced. Furthermore, the new measure increases the number of plants in afforestation to 4,000 plants per hectare as has been requested by the industry. The lower limit for project areas eligible for grant is lowered from 5 to 2 hectares, which will make the measure more attractive for many farmers. The change takes place at the request of the industry, which estimates that the change will provide a significantly larger number of applications.

Afforestation reduces loss of N of app. 50 kg N per hectare per year in the root zone⁴. The specific effects in the aquatic environment will vary depending on local conditions including natural N retention. As the

⁴ Ibid.

measure is targeted private afforestation interventions in catchments to water bodies, the N-reducing effect of private afforestation is expected to be 30 kg N per hectare. Against this background, the expected effect of the establishment of 5.000 hectares of new forests in 2017-2021 will reduce the loss of N to surface waters by approximately 150 tonnes N per year and reduce the CO₂ emissions by about 16,000 tonnes per year.

The effect of the private afforestation is permanent, as the afforested area officially and legally is converted from agricultural to forest land.

Constructed mini-wetland measure

Constructed mini-wetlands target N removal in agricultural drainage discharge generally considered to deliver 45-60 percent of the total N-loss to the aquatic environment⁵. The adopted budget of the measure (app. 97,5 mio. DKK annually) is expected to result in the establishment of about 1.000 mini wetlands in 2021 with an average effect of about 900 kg N per year per installation. The calculated average N-effect is based on research on full-scale projects made by Aarhus University.

Mini-wetlands are generally expected to reduce the N transport by 25 percent in connected drains from the fields when preconditions as to the size of the catchment area, drainage discharge of N (volume and concentration) and type of soil etc. are met⁶.

The efficiency of the measure depends on the correct location of the mini wetlands. In order to obtain the full N-effect, mini wetlands have to be located in areas with a mean drainage discharge of about 35-40 kg N per hectare per year, draining app. 100 hectares of catchment area. The Danish Agrifish Agency is currently leading a project in collaboration with Aarhus University to identify suitable locations with a sufficient drainage discharge. It is expected that applicants will be prioritized based on the result of this project combined with documentation of the content of N in the drainage water, which the applicant will be asked to provide. Often the suitable location of mini wetlands occurs on land, which is periodically wet and only extensively used. The farmers are not compensated for the take-up of land but only for the expenses related to the creation of the facility.

The participation in the constructed mini wetland measure is voluntary. The Ministry of Environment and Food is currently uncovering the conditions necessary to make the mini wetland measure more attractive for farmers to engage in. In this context, the Ministry of Environment and Food is investigating the possibility for the farmers to use mini-wetlands as a means to meet the regulation requirements under the new targeted N regulation, following the maintaining period of the mini-wetland measure (3 years). This is expected to enhance farmers'

⁵ "Virkemidler til realisering af 2. generations vandplaner og målrettet areal regulering" http://pure.au.dk/portal/files/84646400/Virkemiddelkatalog_web.pdf.

interests in participating in the mini wetland measure considerably. Otherwise, the reduction of N loss by constructed mini wetlands will reduce the need for other N-reducing measures within specific catchment areas. For example, this applies when Denmark in the years to come implements a more targeted N- regulation where local needs are considered.

SEGES⁷ estimates the potential for constructed mini wetlands to be up to 3.000-10.000 installations. SEGES finds that there is a very high willingness amongst farmers to participate in the mini wetland measure due to the fact that the uptake of arable land is very limited compared to other N-reducing initiatives. Farmers would therefore be interested in constructing a mini wetland. Furthermore, SEGES has indicated that they are willing to assist with the education of agricultural advisors and hereby support farmers' applications for the measure.

⁷ SEGES is the newly amalgamated Knowledge Centre for Agriculture and the Danish Pig Research Centre under the Danish Agriculture & Food Council.

To: [REDACTED]
Cc: Line Andersen (land@mivm.dk); [REDACTED]
Fra: Christian Vind (chvin@mivm.dk)
Titel: SV: Follow-up notes to the meeting 8th of January.
Sendt: 29-01-2016 08:29:19

Dear [REDACTED]

Thank you very much. We are looking forward to advance the dialog and answer your questions next Friday.

We will discuss the details with [REDACTED]

Best regards,
Christian Vind

Fra: [REDACTED]
Sendt: 28. januar 2016 17:25
Titel: Christian Vind (MFVM-DEP)
Cc: Line Andersen (MFVM-DEP); [REDACTED]
Emne: RE: Follow-up notes to the meeting 8th of January.

Dear Christian Vind,

Thank you for your message and for sharing further documents related to nitrogen regulation in Denmark, which required further assessment and internal discussion during the last week. In addition I was taken in meetings most of the past few days.

Following your proposal, and as conveyed by my Director in the phone call with Deputy Permanent Secretary Mikkelsen, my colleagues would be available for a technical workshop to further understand elements concerning the documents you have sent (e.g. follow-up notes and the baseline report and its revision).

We are trying to find a room for Friday 5 February, from 10:00 to 13:00.

My colleague [REDACTED] (in copy) will contact you soon to define the details of the workshop.

Best regards

[REDACTED]

[REDACTED]



[REDACTED]

Disclaimer: "This message does not constitute a formal communication and the views expressed are purely those of the writer and may not in any circumstances be regarded as stating an official position of the European Commission."

From: Christian Vind (MFVM-DEP) [mailto:chvin@mivm.dk]
Sent: Monday, January 25, 2016 2:00 PM
To: [REDACTED]
Cc: Line Andersen (MFVM-DEP)
Subject: VS: Follow-up notes to the meeting 8th of January.

Dear [REDACTED]

I have just tried to reach you by phone.

I would like to follow-up on my mail from last week and hope that you have considered our proposal of a technical workshop, if you still have questions to the policies or the scientific work there are built upon.

Please call back if possible, I am available the rest of the afternoon.

Regards,
Christian

Fra: Christian Vind (MFVM-DEP)
Sendt: 19. januar 2016 12:36
Til: [REDACTED]
Cc: Line Andersen (MFVM-DEP); Hans Peter Olsen; Sofus Rex (MFVM-DEP); [REDACTED]
Sofus Rex (MFVM-DEP)
Emne: Follow-up notes to the meeting 8th of January.

Dear [REDACTED]

Thank you for the very fruitful meeting the 8th of January.

To answer some of you question I have attached 4 follow-up notes on:

- A) The adjustment of the "harmony rules"
- B) The adjustment of prohibition on soil tillage
- C) The effect regarding statutory buffer strip
- D) On targeted nitrogen regulation.

On top of that, a number of research-paper lies behind the effects described in the notes. The Danish RBMPs are based on extensive research from Aarhus University and DHI. Below is a list of the key rapports prepared leading up to the draft RBMPs as published in December 2021:

'The baseline report' is a technical report authored by the University of Aarhus. The report estimates the expected change in nitrogen load in the period 2013-2021 based on a 'frozen policy scenario'. In accordance with the planned changes to regulation, the University of Aarhus has published a revision of the original report.

The target load in the Danish coastal water bodies is a result of statistical and mechanistic modelling done by the University of Aarhus and DHI. The models are described in three reports: Part I – summary, Part II – mechanistic models, and Part III – statistical models. A set of minor revisions have been made to the original models, which are expected to be published during the spring.

All of the scientific reports behind the draft RBMPs is available via this link.

It is important to us, that we answer all you questions as detailed as required, and would therefor propose a technical workshop – either as a meeting i Bruxelles or Copenhagen or via video-link. If you are interested, we could invited some of the scientist to the talks as well. A possible date could be sometime i the last week of January (25. – 29. Of January), so that we hopefully can make sure that there are no unanswered questions left when we reach the meeting in the Nitrates committee late February.

You are also more than welcome to send written questions to the notes that we send the 7th of January and to the follow-up notes if that is more convenient for you with written questions and answers and please let us know if there are specific parts of the scientific documents that you would like translated.

Regards,
Christian Vind

Best regards

Christian Vind
| Landbrug og miljø
+45 41 31 84 87 | chrvin@mfvm.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfvm@mfvm.dk | www.mfvm.dk

To: [REDACTED]
Cc: Line Andersen (land@mfvm.dk)
Fra: Christian Vind (chvin@mfvm.dk)
Titel: VS: Follow-up notes to the meeting 8th of January.
Sendt: 25-01-2016 14:00:10

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Regards,
Christian

+45 4131 8487

Fra: Christian Vind (MFVM-DEP)
Sendt: 19. januar 2016 12:36
Titel: [REDACTED]
Cc: Line Andersen (MFVM-DEP); Hans Peter Olesen; Sofus Rex (MFVM-DEP); [REDACTED] Sofus Rex (MFVM-DEP)
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To: [REDACTED]
Til: [REDACTED]
Cc: Sorus Rex (sotur@mfvn.dk), [REDACTED], Sorus Rex (sotur@mfvn.dk),
Line Andersen (land@mfvn.dk), Olsen, Hans Peter (hapol@mst.dk)
Fra: Christian Vind (chvin@mfvn.dk)
Titel: Follow-up notes to the meeting 8th of January.
Sendt: 19-01-2016 12:36:19
Bilag: Bilag 1 note on consequences of adjusting harmony rules.docx.pdf; Bilag 2 - Follow-up note adjustment of prohibition on soil tillage.doc.pdf; Bilag 3 - Follow-up note concerning N and P effect of statutory buffer strips.docx.pdf; Bilag 4 - Follow-up note targeted nitrogen regulation.docx.pdf;

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The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfvn@mfvn.dk | www.mfvn.dk



**Ministry of Environment
and Food of Denmark**
Environmental
Protection Agency

Danish EPA Commerce,
Industry and Agriculture
MST-001-14020
Ref. nevni
January 8, 2016

Note on the consequences of adjusting the “harmony rules” for growers and finishers (pigs for slaughter) to 1.7 livestock unit per hectare

Harmony rules set requirements for the minimum size of the area a livestock holding must have available for spreading livestock manure from the respective livestock production. The requirement is defined as a limitation in livestock units per hectare (LU/ha), based on the content of nitrogen in the respective livestock manure (ex. storage), where 1 LU is equal to 100 kg N in livestock manure in the best modern production system with the lowest ammonia emission. Thereby the harmony rules implement the Nitrates Directive’s requirement to limit the amount of manure per hectare to max. 170 kg N, corresponding to 1.7 LU/ha in the best production system. Since 2002, Denmark has imposed a tightened requirement for holdings producing pigs, poultry and fur bearing animals, as the harmony rule for these categories of livestock productions has been adjusted to 1.4 LU/ha.

Situation

On 22 December 2015, the Danish government and political parties representing a majority of the seats in the Danish Parliament agreed on a package of initiatives that will strengthen the Danish agriculture and food sectors. One of the initiatives is to adjust the Danish harmony rules for growers and finishers (pigs for slaughter) to 1.7 LU/ha from the current 1.4 LU/ha.

This implies that farms with growers and finishers can spread manure from growers and finishers on a smaller area leading to lower costs of transportation and potential gains for the holdings from sales of farmland. The adjusted harmony rules may lead to a more concentrated use of livestock manure from fertilization – however neither exceeding fertilizing standards for the respective crops nor the Nitrates Directive limit of 170 kg N/ha on farm scale. Nevertheless, the farmer will still have incentives to utilize the nutritious value of the manure on a larger area, if this value exceeds the costs of transportation.

Harmony rules today

Currently, the average density of livestock in Denmark is approximately 0.9 LU/ha. The maximum permitted livestock density, according to the harmony rules in Denmark, is not fully utilized due to a combination of market situation, financial limitations, legal barriers and environmental concerns. This note aims to describe how the legal regulation ensures that any significant consequences for nitrate leaching, from potential increase in livestock production in Denmark due to an increase of the harmony rules, are prevented.

If the individual farmer does not have enough farmland to comply with the harmony rules, he may need to make agreements with other owners of farmland to

spread manure. Another possibility is to export manure to manure treatment facilities. Approximately 60 % of the growers and finishers in Denmark are produced on holdings that have 1.4 or more LU/ha.

The current system of livestock approvals

All establishments, expansions or modifications of livestock holdings must receive a permit to go through with the changes in compliance with the Environmental Approval Act of Livestock Holdings regardless of (current and aspired) livestock density at the respective farm. This implies that the local authorities process each application according to the act and approve or deny the changes applied for.

The act sets minimum thresholds in order to ensure environmental protection for odour, ammonia emissions, leaching of nitrates and phosphorus surplus, which all applicants must comply with in order to obtain an approval. The local authorities assess the environmental impact on a local and national scale together with the minimum requirements. If the approval is given, it will be on a set of conditions that ensures no significant negative effect on the surrounding environment.

The approval system is expected to be changed towards 2018 as described in the separate note on "The future regulation of the loss of plant nutrients to the aquatic environment in Denmark". The changes are not expected to affect the general level of environmental protection and will not change the fact that all establishments, expansions or modifications of livestock holdings must receive a permit or equivalent, in the future regarding the environmental impact from the actual animal housing, manure and silage storage facilities etc. Regarding the spreading of manure, the new system will ensure a protection of the environment corresponding to the current level through a new set of general rules.

Specific elements of the approval system that affect the number of livestock

Elimination of all extra nitrates leaching in areas with increasing numbers of livestock

In order to comply with the Habitats Directive, the local authorities must take into account, whether the amount of livestock units within the catchment area increases with the changes applied for. If the amount of livestock is increasing (with more than 1 % since 2007), the approval will include requirements on measures that eliminate the extra nitrate leaching to surface water from livestock manure compared to a standard amount of nitrates leaching from a crop farm not using livestock manure. In most cases, this requirement will be met by establishing larger areas with catch crops within the farm area.

If a permit to produce livestock is given during a period where the number of livestock units within the catchment area has increased, the permit will contain a permanent set of conditions to neutralize the effect of increased pressure. In the updated system, holdings within the catchment areas with increasing number of livestock units will receive a yearly common requirement of establishing a larger area with catchment crops. This requirement will apply to and be shared between all livestock holdings within the catchment area.

Limitations in vulnerable Natura 2000 catchment areas

For farmland within catchment areas adjacent to Natura 2000 aquatic areas sensitive to nitrates, the area will have lower livestock limits than the harmony rules. This means that approvals for livestock holdings will contain requirements of stricter harmony rules (limiting livestock density to a lower number of LU/ha).

This lower limit may be transferred to compensating actions, such as establishment of an additional area of catch crops, if the farmer wishes to have a higher livestock density than the harmony rules allow.

In the future approval system, this regulation will consist of individual requirements for establishing catch crops designed for each holding based on information from the fertilizer accounting system instead of individual assessments by the local municipalities like today.

Phosphorus regulation

In the current system, phosphorus in the manure is indirectly regulated in the harmony rules and directly in certain areas (app. 12 %) where phosphorus surplus is limited. Increasing the harmony rules from 1.4 LU/ha to 1.7 LU/ha may lead to a locally higher application rate of livestock manure on some farmland. From growers and finishers, the maximum application may increase from max. 34 kg P/ha to 40 kg P/ha with the adjusted harmony rules. To ensure that this higher concentration of livestock manure usage does not lead to unacceptable negative environmental effects, a new and direct regulation of the application of phosphorus from livestock manure will be implemented simultaneously with levelling the harmony rules. It is discussed if other animal types should also be able to use 1.7 LU/ha, and in that case the direct phosphorus regulation will take even higher potential application into account.

Regulation of ammonia emissions from the livestock housing

In case of establishment, expansion and modifications of livestock farms, the basic regulation is that ammonia emissions from animal housing and manure storage facilities must be reduced by 30 percent in accordance with a reference animal housing system. The requirement may be met by reducing ammonia loss in both existing and new facilities. As long as the total livestock production is unchanged or only increasing slightly, this requirement for 30 percent reduction will ensure that ammonia emissions are reduced.

Control

The councils of the Danish municipalities are the supervisory authority for environmental inspections on all agricultural farms. The municipalities must inspect all livestock farms of more than 3 LU regularly. Larger livestock farms are inspected about every third year, smaller livestock farms about every sixth year.

These minimum frequencies for inspections are laid down in a specific statutory order about environmental inspections. The frequency of inspections is not only determined by the size of the farm, but by a systematic appraisal of the environmental risks as well.

The inspector will check compliance with all the environmental regulation of which the council of the municipality is the supervisory authority, including provisions in the Danish Order on commercial livestock, livestock manure, silage, etc. In the future approval system this will not change.

Ministry of Environment and Food of Denmark

The Danish AgriFish Agency

J.nr.: 15-8097-000137

Date: 13 January 2016

Follow-up note

Expected effect on N and P-leaching resulting from a minor adjustment to the prohibition on soil tillage during autumn/winter

At a meeting by video link on 16 December 2015 concerning a new Danish nitrogen regulation, the European Commission requested further information on the consequences concerning N- and P-leaching of the planned adjustment to the prohibition on soil tillage.

This note describes the adjustment to the existing prohibition and provides information on the effects of the prohibition on N- and P-leaching.

Existing and future exceptions to the prohibition on soil tillage

The general prohibition on soil tillage on areas where the following crop is a spring crop in Denmark is a measure to reduce nitrogen leaching from arable land during autumn/winter. The prohibition is effective from harvest until either 1 November or 1 February depending on the soil type (clay/sand). Since the introduction of the prohibition, a number of exceptions have been added, omitting e.g. areas with winter crops and catch crops, areas with perennial woody plants and organically farmed areas. These and other exceptions have been added in order to allow earlier tillage on areas, where early tillage is necessary, for example in order to allow for mechanical weed control on areas where the use of pesticides is prohibited.

Three further areas have been recognized as being specifically problematic to the farmers and are planned to be included on the list of exceptions:

1. Preceding the establishment of sugar beets
2. On soil types with a high relative content of clay (JB 7-9 according to the Danish soil classification system)
3. Following harvest of maize on sandy soils

The rationale behind the addition of the new exceptions is to allow for a proper preparation of the seedbed and to avoid soil compaction (exceptions no. 1 and 2) and to allow for mechanical pest control against the European corn borer (exception no. 3).

N-effects of the prohibition on soil tillage

The prohibition on soil tillage during certain periods has been estimated by Aarhus University to reduce N-leaching from the root zone by approximately 10 kg N/ha. Before the introduction of the prohibition, the majority of farmers already followed the deadlines of the prohibition

(there is a "deadweight loss"). Even though this behaviour is beneficial to the environment, these areas are not included in the estimation of the N-effect of the prohibition.

When excluding the deadweight loss from the calculations, the expected effect of the existing prohibition is an N-effect corresponding to a reduction of 341 tons of N/year to the marine environment. The three new exceptions described in this note are estimated to result in an increase in N-leaching of approximately 66 tons. Thus, with the inclusion of the new exceptions, the expected effect of the adjusted prohibition is approximately 275 tons N/year. The small increase in N-leaching following from the inclusion of the new exceptions should be considered in relation with the large deadweight loss, which is not included in these calculations.

It should be noted, that the calculated effect of the adjusted prohibition is dependent on the exact setup of the exceptions, which is still in progress. It is expected, though, that the adjusted effect will not vary considerably from the one calculated in this note.

P-effects of prohibition on soil tillage

The prohibition on soil tillage can affect P-leaching in areas with a risk of P-leaching by erosion, surface runoff or transport of water through macro pores in the soil. Depending on local conditions, the effect on P-loss can be either positive or negative. On one side, risk of loss of P by erosion is increased by early soil tillage. On the other side, if the timing of the soil tillage is improper, it might result in compaction of the soil, which can increase the risk of P-leaching by surface runoff and macro pore flow. On this basis, Aarhus University has not been able to estimate the effect of the prohibition on P-leaching.

Ministry of Environment and Food of Denmark

The Danish AgriFish Agency

J.nr.: 15-8097-000137

Date: 13 January 2016

Follow-up note

The nitrogen and phosphorus effect of statutory buffer strips

This note gives a short description of the nitrogen and phosphorus effect of statutory buffer strips as a follow up to the note of 10 December 2015 (j.nr. 2015-6878), where the Ministry of Environment and Food explained a model for intermediate compensatory measures to avoid deterioration of the aquatic environment (surface waters and groundwater) to the Commission. This model includes an annulment of the requirement of statutory buffer strips, which currently cover 25,000 hectares.

The nitrogen (N) effect

The estimates of N reduction effect of the 25,000 hectares present mandatory buffer strips are estimated by Aarhus University to up to 1,039 tonnes N. Since this is the upper estimate and there is a very high uncertainty in data, the Ministry of Environment and Food estimates, that the loss in practice is more likely to be approx. 725 tons N, as described in the note of 10 December 2015. This loss in nitrogen effect will be handled as described in "Follow up note – Model for intermediate compensatory measures to avoid increased N emission". This note describes in details how the increased N emissions are handled, including the expected effect concerning the voluntary maintenance of buffer strips to meet the EFA requirements.

The phosphorus (P) effect

Aarhus University has estimated the P effect of 25,000 hectares buffer strips to be 3-19 tons P annually on condition that the buffer zones are harvested. While harvesting is not statutory, the effect in practice could be less.

Part of the P effect will be maintained, due to the persistence that there on the majority of the same streams and lakes will still be a demand for 2 meter buffer strips according to §69 of the Watercourse Act ("Vandløbsloven"). In addition, a part of the P effect of mandatory buffer stripes will be maintained because of the EFA requirements, where the Ministry of Environment and Food estimates that a significant part of the present buffer strips will be maintained on a voluntary basis.

A more targeted establishment of buffer strips can also optimize the P effect. Work will continue in the Ministry of Environment and Food with this instrument towards the implementation of the targeted regulation.

Ministry of Environment and Food of Denmark

The Danish AgriFish Agency

J.nr.: 15-8097-000137

Date: 13 January 2016

Follow-up note

Further elaboration on the targeted nitrogen regulation in Denmark from 2018 and onwards

The future targeted regulation of nitrogen is expected to be implemented from 2018 and onwards. The regulation will be mandatory for all farmers and is assumed to reduce nitrogen emissions by approximately 3,800 tons nitrogen in 2021. The regulation will be based on four main principles:

1. The leaching access in each coastal waterbody is differentiated geographically in order to meet the nitrogen target in each coastal waterbody (in total 90 coastal waterbodies in Denmark). In the calculation of the leaching access, the average retention from the root zone to the coastal waterbody is taken into account.
2. Each farm is appointed a leaching permit to the water environment. The permit is calculated as the maximum nitrogen leaching from the root zone per hectare (kg N per hectare). Each farm within a catchment area will be appointed the same leaching permit per hectare.
3. Each farmer is given flexibility in the choice of instruments (e.g. catch crops, buffer strips, reduced nitrogen application etc.) in order to comply with the leaching permit. The instruments all contribute to reduce nitrogen leaching at farm level, and the relevant combination of instruments will help farmers ensure that the leaching permit is not exceeded. The number of instruments that the farmers can choose from will expectedly be increased up to the implementation of the targeted regulation.
4. Compensation to farmers for costs involved with the compliance of the reduced leaching permit. It is expected that the targeted regulation will contribute to a reduced nitrogen contribution to the coastal water bodies by approx. 3,800 tons in 2021.

It should be emphasized that the targeted regulation is part of a bigger conversion of the Danish nitrogen regulation. From 2017, a voluntary targeted scheme resulting in extra catch crops (on top of the mandatory catch crops) will be instigated. The scheme will be targeted to areas with specific needs to reduce nitrogen leaching to the aquatic environment including ground water. The scheme will reduce nitrogen emissions by 818 tonnes in 2017 and 693 tonnes in 2018.

Besides the above-mentioned initiatives, a series of collective efforts will be established in 2017-2021. This includes for example re-established wetlands, constructed wetlands and

afforestation. These initiatives will be funded through the Rural Development Programme. The collective efforts will reduce nitrogen emissions by 1,435 tonnes in 2021.

Furthermore, it is noted that the Danish Nitrate Action Plan is currently being revised in accordance with the Nitrates Directive. It is expected that a new Nitrates Action Plan 2016-2020 will be effective from August 2016.

The Danish River Basin Management Plans are currently undergoing revision in accordance with the Water Framework Directive. Updated River Basin Management Plans are expected to be finalized in the first half of 2016.

The implementation of all the above-mentioned initiatives is currently undergoing comprehensive work. The completion of the initiatives requires close coordination within the Ministry of Environment and Food and continuous dialogue with the Commission to ensure compliance with all relevant EU legislation.

SV: Follow up on bilateral meeting with the Commission on Nitrate Action Programme
TI: [REDACTED]
Cc: Helle Bach Rungø (helba@mfvm.dk), Sofus Rex (sofur@mfvm.dk), [REDACTED]
Fra: Christian Vind (chvin@mfvm.dk)
Titel: SV: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 15-12-2015 13:49:03

Dear [REDACTED]

Great, I can confirm that we are available for a videoconference tomorrow from 17:00 to 18:00.

Please coordinate the technical details regarding the set-up with Helle Bach Rungø.

Best regards,
Christian Vind

Fra: [REDACTED]
Sendt: 15. december 2015 13:43
TI: Christian Vind (MFVM-DEP)
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP); [REDACTED]
Emne: RE: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear Christian Vind,

We would be available for a videoconference tomorrow, Wednesday 16 December, from 17:00 to 18:00. If this date and time is suitable for you, I will then follow up with the technical details to set-up the videoconference.

Best regards

[REDACTED]



European Commission

[REDACTED]

The views expressed are purely those of the writer and may not in any circumstances be regarded as stating an official position of the European Commission. This message may contain personal and other confidential data that are entrusted to the recipients specified in the header of the message.

From: Christian Vind (MFVM-DEP) [mailto:chvin@mfvm.dk]
Sent: Tuesday, December 15, 2015 8:46 AM
To: [REDACTED]
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP)
Subject: VS: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear [REDACTED]

I have tried to contact you by phone but have not been succesful.

Thus with reference to the enclosed notes on the future regulation of nitrates in Denmark, I would like to enquire whether it would be possible to set up a video conference meeting on Thursday the 17th of December, where we on a technical level can explain our solution and discuss any questions you may have regarding the notes. Our colleagues have already been in contact with [REDACTED] from DG Agri with this proposal, and they are willing to conduct such a meeting in collaboration with you at DG Envi. Please see attached correspondance (please note that Wednesday have changed to Thursday).

In reference to this we have through our permanent representation also proposed a bilateral meeting on the 6th of January 2016 at directors-level between our Deputy Permanent Secretary Anders Mikkelsen and Director Humberto Delgado-Rosa as a further follow up on the meeting we had the 27th. of November 2015 as well as on the basis of the more technical video-conference meeting we propose on Thursday.

We are fully aware of the tight schedule, but hope that you may appreciate the relevance of these meetings and thus be able to find the time.

Please do not hesitate to contact me or my colleage, Helle Bach Rungø, with questions both practical and otherwise.

Best regards
Christian Vind

Med venlig hilsen
Best regards

Christian Vind
| Landbrug og miljø
+45 41 31 84 87 | chvin@mfv.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfv@mfv.dk | www.mfv.dk

Til: [REDACTED]
Cc: [REDACTED] Anders Mikkelsen (ami@mfv.dk),
Christian Vind (chvin@mfv.dk), Sofus
Rex (sor@mv.dk), Oiser, Hans Peter (hapol@mst.dk), Lidde Bagge Jensen (libj@mst.dk), Marie
Guldborg (magu@naturerhverv.dk), Louise Piester (DEP) (louj@fv.dk), Lars Kolze
(NaturErhvervstyrelsen (LAK@naturerhverv.dk), jakm@naturerhverv.dk (jakm@naturerhverv.dk), Mette
Lise Jensen (meje@nst.dk), Thomas Bruun Jessen (tbr@nst.dk), Jesper Wulff Pedersen (jwp@mfv.dk)
Fra: Helle Bach Rungø (helba@mfv.dk)
Titel: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 14-12-2015 16:27:19

Dear [REDACTED] and [REDACTED]

Thank you, [REDACTED] for a very fruitful discussion at the bilateral meeting between the Commission and the Danish delegation on November 27th. And also thanks to DG Agri for a number of very constructive talks.

As background material for a technical discussion, which we are just about to set up with you, we hereby enclose:

- a note on a model for intermediate compensatory measures to avoid increased N emission
- a note on the future regulation of the loss of plant nutrients to the aquatic environment in Denmark

We hope that this material will clarify the key issues of the future regulation of nitrates in Denmark. We look forward to discussing the details of the notes with you, and will contact you shortly with regards to planning of a technical meeting later this week.

Best regards,

Helle Bach Rungø
Agriculture and Environment
+45 91 36 58 59 | helba@mfv.dk

Ministry of Environment and Food of Denmark
Ministry Department | Børsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mfv.dk

To: [REDACTED]
Cc: Sofus Rex (sofur@mfv.dk), Helle Bach Rungø (heiba@mfv.dk)
Fra: Christian Vind (chvin@mfv.dk)
Titel: VS: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 15-12-2015 08:46:19
Bilag: Bilag 1 Note on model for intermediate compulsory measures dep MST NST N....docx; Bilag 2 New regulation in Denmark in three steps 101215 naer nst-3.docx; VS DK envisaged hihg level meeting next week on the ND .WFD implementation.msg;

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Please do not hesitate to contact me or my colleague, Helle Bach Rungø, with questions both practical and otherwise.

Best regards

Christian Vind

Med venlig hilsen
Best regards

Christian Vind
| Landbrug og miljø
+45 41 31 84 87 | chvin@mfv.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfv@mfv.dk | www.mfv.dk

To: [REDACTED]
Cc: [REDACTED], Anders Mikkelsen (ami@mfv.dk), [REDACTED], (Michael.Plecke@ec.europa.eu), Christian Vind (chvin@mfv.dk), Sofus Rex (sofur@mfv.dk), Olsen, Hans Peter (hapol@mst.dk), Lasse Bagge Jensen (lkbj@mst.dk), Marie Guldborg (magu@naturerhverv.dk), Louise Piester (DEP) (louj@fv.dk), Lars Kolze (NaturErhvervstyrelsen (LAK@naturerhverv.dk), jakm@naturerhverv.dk (jakm@naturerhverv.dk), Mette Lise Jensen (melje@nst.dk), Thomas Bruun Jessen (tbr@nst.dk), Jesper Wulff Pedersen (jwp@mfv.dk)
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Best regards,

Helle Bach Rungø
Agriculture and Environment
+45 91 36 58 59 | heiba@mfv.dk

Ministry of Environment and Food of Denmark

Ministry of Environment and Food of Denmark

Danish AgriFish Agency/Nature Agency/Environmental Protection Agency

J.nr. 2015-6878

Date: 10. December 2015

Note

on a model for intermediate compensatory measures to avoid increased N emission

The Danish Government is presently preparing the basis for a political agreement addressing improvement of the production conditions for the Food- and Agricultural business. The political agreement is expected to result in a new and more targeted way of regulating nitrates in Denmark in the future, expected to be in place in 2018. Key elements in the political agreement are lifting the reduced general fertilization standards for nitrogen to the level of economic optimum, annulment of the statutory buffer strips along lakes and watercourses and a minor adjustment of the, prohibition on soil tillage in the autumn.

The general fertilization standards for nitrogen and the current reduction of these standards to a level below economic optimum are currently part of the Danish implementation of the Nitrates Directive, and thereby also the Danish implementation of the Water Framework Directive.

Lifting the reduced standards to the economic optimum level and the annulment of the requirement for mandatory buffer strips will result in an increased loss of nitrogen to the aquatic environment. The increased loss of nitrogen will be countered by compensatory measures in order to ensure an adequate implementation of the Nitrates Directive and Water Framework Directive.

The model to avoid deterioration of the aquatic environment (surface waters and groundwater) will be presented in the following.

Table 1 shows the expected need for further measures to compensate the increased loss of nitrogen to surface waters in the period 2016-2018 (based upon scientific calculations). It is assumed that the reduced fertilization standards will be increased by two thirds in 2015-2016 and by one third in 2016-2017, thus the standards will represent the economic optimum in 2016-2017.

The need for further measures in each individual year is based on a recent recalculation of the nitrogen load. The baseline for 2013-2015 is deducted in the calculation and reflected in the increased load of nutrients to individual coastal water bodies.

The figures in table 1 is based on the following decisions and calculations:

- The increased loss of nitrogen resulting from the annulment of the buffer strips (approx. 725 tonnes N),

- The increased loss of nitrogen resulting from lifting the reduced general nitrogen fertilization standards (approx. 2.740 tonnes N in 2016 increasing to 4.350 tonnes N in 2018), and
- The development of the baseline (accumulation of the effect of measures already in place, structural development etc.) contributing to the reduced loss of nitrogen.

Table 1. Intermediate need for further nitrogen reduction in 2016-2018 resulting from increased N emission to surface waters

Year	2016	2017	2018
Need for further nitrogen reduction to avoid deterioration (tonnes N)	915	1395	1004

Note: The consequences for groundwater are not reflected in the table. The figures are aggregated at national level, and variation at coastal water level is possible.

A new targeted N-regulation is expected to ensure a sufficient protection of the surface waters from 2018. The targeted N-regulation will be explained further in a separate document, to be presented to the commission.

Measures in an intermediate compensatory model

To avoid deterioration of surface waters and groundwater the Danish Government has ensured the financing and legal basis for two intermediate compensatory environmental initiatives. On a short term basis (2016-2018) it is generally expected to be possible to target measures to avoid deterioration locally, and on a long term basis (2019-2021) the initiatives – combined with the targeted regulation – are expected to ensure a gradual improvement of the aquatic environment.

The model to avoid deterioration in the period 2016-2018 is presented in table 2 below. The model includes the following regulatory initiatives:

- Changes in national regulation of mandatory catch crops.
- Subsidy schemes to establish wetlands, mini-wetlands and afforestation, Land lease schemes with cultivation restrictions, ensuring establishment of additional catch crops.

In 2016 the increased load of nitrogen beyond baseline 2013-2015 to surface waters will be partly compensated by N-reducing measures in national legislation working in combination with the chosen EFA-types in Denmark to fulfill the greening requirement of Ecological Focus Areas (EFA) in the CAP. Further analysis is required to establish to what level each individual regulatory initiative addresses the deterioration of the groundwater status and how these can be targeted against deterioration (see further below).

Table 2 - Intermediate compensatory initiatives (additional need for nitrogen reduction, as in table 1, and N-reducing impact in tonnes per year in surface waters)

Year	2016	2017	2018	I
Need for nitrogen reduction to avoid deterioration (tonnes N in surface waters)	915	1395	1004	
N-reducing measures				
Changes in regulation of national mandatory catch crops	1197	867	867	
Additional establishment of mini-wetlands, wetlands, afforestation (RDP-financed)		107	221	
Land lease with cultivation restrictions resulting in extra catch crops		818	693	
Total	- 282	- 397	- 777	

Note: It is assumed that land lease with cultivation restrictions will be carried out on 85.500 hectares in 2017 and 72.500 hectares in 2018. The scope of the initiative is targeted to ensure an impact on groundwater as well.

Influence on groundwater

The changes to the nitrogen regulation as described above will - all else being equal - increase the amount of nitrates in the groundwater. The compensatory initiatives are expected to ensure that there is no deterioration of the aquatic environment, ie. surface waters. These initiatives will also counter deterioration of ground water quality. However, since there is no certain one-to-one correlation between initiatives that counter deterioration of the quality of the surface water and the quality of the groundwater, the risk of deterioration of the groundwater can currently not be fully eliminated.

The Ministry of Environment and Food are therefore currently investigating solutions and data concerning groundwater. The Geological survey of Denmark and Greenland is currently evaluating in detail the groundwater status and the geographic distribution of necessary compensatory measures in relation to groundwater. The full evaluation will be completed in June 2016.

The preliminary assessment is that there will be a particular need for compensatory measures in geographical areas related to areas of groundwater, in which the quality standard for nitrate

(75%) is close to being exceeded or have a significant and sustained upward trend above 75% of the quality requirement regarding nitrate. It is expected that from areas where there is relatively little nitrogen loss to surface waters because the soil on the areas will withhold a larger proportion of nitrogen, nitrogen will to a certain degree leach into groundwater.

The changes to national regulation of catch-crops on farmland are expected to have an impact on groundwater. In addition, the land lease model (described below) will be targeted groundwater in order to avoid deterioration of groundwater and reverse any significant and sustained rising trends of nitrate in the groundwater.

Changes in regulation of the establishment of national mandatory catch-crops

As a condition for receiving the green payment under the CAP direct payments, farmers must comply with three greening requirements, including the requirement of ecological focus areas (EFA) on 5 per cent of the arable land on each farm. To increase the effect of a national requirement of 240.000 ha of catch crops and the EFA-areas, a flexibility given to farmers whereby they can use some EFA-areas as an alternative to the national catch crops will be removed.

A total EFA area of approximately 105,000 hectares is needed in Denmark to comply with the 5 per cent requirement. According to Danish legislation, the EFA area can be established by buffer strips, catch crops, fallow land, coppice and landscape elements. The mandatory buffer strips cf. the national Law on mandatory buffer zones contributes to EFA with approximately 24,000 EFA-hectares today.

According to the proposal by the government to repeal the requirement of additional buffer strips, which has recently been presented in parliament, the farmer can choose to apply other EFA-measures than buffer strips, to meet the EFA requirement. The alternative measures will have a positive effect on reduction of nitrogen leaching in so far as they were not already established before the annulment of the law on mandatory buffer strips. This will offset entirely the increased nitrogen loss resulting from the annulment of the law.

It is expected that farmers will mainly fulfil their resulting need for additional EFA requirements by establishing extra catch crops, maintaining existing buffer strips voluntarily or lay land fallow.

According to continued national legislation farmers must establish 240.000 ha of catch crops. At present farmers are given a flexibility to replace establishment of catch crops required by the Order on Plant Cover with alternative measures such as elements included in the EFA-measures (fallow land and coppice). In order to ensure the best possible nitrogen-reducing impact of the greening requirements, the flexibility on catch crops in the Order on Plant Cover will be removed. By not allowing farmers to replace mandatory catch crops with EFA elements such as laying land fallow or establishing coppice, the full effect on reduction of nitrogen loss is obtained for both mandatory catch crops and the EFA requirement. These elements will have a full nitrogen reducing effect, also in future years.

The Ministry of Environment and Food estimates that the changes could result in a number of different combinations of buffer strips and catch crops with a significant effect on N-leaching,

for instance; 70.000 hectares additional EFA- catch crops and the maintaining of 4.000 hectares additional buffer strips that would otherwise be removed.

The effect of the changes to national regulation of mandatory catch crops is estimated to be a reduced nitrogen loss of 1,197 tonnes N in 2016 and 867 tonnes N in both 2017 and 2018. Since the initiative is mandatory for farmers, the effect is certain and will be permanent.

The changes will provide a reduction of nitrogen loss to both surface waters and groundwater. They will be implemented through revision of the Danish Order on Plant Cover with effect from August 2016. This will not affect the Danish implementation of the greening requirements pursuant to REG (EU) 1307/2013.

Land lease with cultivation restrictions of sowing of catch crops

The Danish government will establish a new land lease scheme for 2017-2018 in order to prevent further nitrogen loss. In the scheme, the state leases farmland on a voluntary basis, imposes nitrogen-reducing cultivation restrictions on the land, such as requirements for catch crops, and then possibly re-leases it to a farmer for a limited period.

It is estimated that the scheme in 2017 will ensure a reduced nitrogen loss to the marine environment of 421 tonnes N. In order to achieve this effect in 2017, it is estimated that the state must lease between 30,000 and 90,000 hectares or up to 4 per cent of the farmed land. The leasing scheme shall work on market terms. Therefore, the economic compensation for farmers will solely be equal to the operating loss endured as a result of the restrictions on the land.

Further there is a need for an effort to sufficiently ensure the protection of the groundwater. The current analysis indicates that it will require a land lease scheme with cultivation restrictions ensuring reduction of nitrogen loss amounting to additional 818 tonnes N in 2017 and 696 tonnes N in 2018 to avoid deterioration of the groundwater status in 2017-2018. The scope of the need will as previously mentioned be further investigated by The Geological survey of Denmark and Greenland in the beginning of 2016 and assessed by June 2016, and the Ministry of Environment and Food is currently assessing various solutions to prevent deterioration in 2016 of the groundwater. A new targeted regulation is expected to ensure a sufficient protection of the groundwater after 2018.



**Ministry of Environment
and Food of Denmark**
Environmental
Protection Agency

Danish EPA Commerce,
Industry and Agriculture
J.nr. 001-13962
Ref. lidbj
December 10 2015

The future regulation of the loss of plant nutrients to the aquatic environment in Denmark

The future regulation of nitrates and phosphorous in Denmark is expected to be implemented in three steps. The three steps cover three different periods, *Step one – from 2016 to 2018, Step two – from 2017 and onwards* and finally *Step three – from 2018 and onwards*. The three steps will be described in the following paragraphs.

Step one – 2016-2018

Short term changes of the regulation of nitrates

Regarding the short term changes of the regulation of nitrates, the regulation is described in the Note on a model for intermediate compensatory measures to avoid increased N emission, dated December 10th, 2015.

Step two – 2017 and onwards

Levelling the harmony rules and ensuring a more direct way of regulating phosphorous in a new regulation of livestock holdings

Coming into effect from 2017, the Danish government wishes to align the "harmony rules" for slaughter pigs, to ensure that the requirement is aligned with the requirement of the Nitrates Directive that specifies the amount of livestock manure per hectare to 170 kg N/ha, corresponding to 1.7 LU/ha. This means that the harmony rules' limit for holdings producing slaughter pigs will be lifted from 1.4 LU/ha to 1.7 LU/ha.

Harmony rules set requirements for the minimum size of the area a livestock holding must have available for spreading livestock manure from the respective livestock production. The requirement is defined as a limitation in livestock units per hectare (LU/ha), based on the content of nitrogen in the respective livestock manure (ex storage). Thereby the harmony rules implement the Nitrates Directive's requirement to limit the amount of manure per hectare to 170 kg N, corresponding to 1.7 LU/ha. Since 2002, Denmark has imposed a tightened requirement for holdings producing pigs, poultry and fur bearing animals, as the harmony rule for these categories of livestock productions has been adjusted to 1.4 LU/ha.

It is necessary to emphasize that harmony rules do not regulate the size of livestock productions as such. They contribute to the management of the environmental impact from livestock production and are regulated through national legislation dealing with and issuing permits for livestock production. So even when the harmony rule is adjusted from 1.4 LU/ha to the Nitrates Directives limit of 1.7 LU/ha, an increase in livestock production at specific holdings would require a specific permit.

By defining the harmony rules as a limitation of livestock units per hectare, an indirect limitation of application of phosphorus from livestock manure is ensured. Hence, Denmark has no direct general limitation of application of phosphorus from livestock manure.

Nevertheless, application of phosphorus is regulated in connection with environmental permits issued for livestock holdings. When granting a permit, the local municipalities will assess the environmental impact of the specific livestock holding. This assessment also covers the application of phosphorus from livestock manure and may result in limitation of phosphorus surplus for specific areas of the respective livestock holding.

Levelling the harmony rules for slaughter pigs from 1.4 LU/ha to 1.7 LU/ha will result in a larger amount of livestock manure applied to the arable areas of these livestock holdings. To ensure that this higher concentration of livestock manure does not compromise the reduction of phosphorus surplus in certain areas, a new and direct regulation of the application of phosphorus from livestock manure will be implemented simultaneously with lifting the harmony rules.

This new regulation of phosphorus (e.g. through phosphorus limits) is a prerequisite for an expected new and more emission-based regulation of livestock productions.

A new and more emission based regulation of livestock holdings

The Danish government will propose a new and more emission based regulation of livestock holdings when granting permits to installations for animal husbandry. The regulation will ensure a simpler and more flexible regulation designed as a permit based on an environmental assessment of the production area in the stable, rather than the number of animals produced in the stable. Besides being simpler and easier to enforce and control, this method targets the emissions of ammonia from livestock holdings in a more precise way.

As a prerequisite for this emission based regulation of permits for installations for animal husbandry the Danish government will propose a separate regulation of the actual installations for the animal production sites (stables, storage vessels i.e.) and the regulation of the spreading of the livestock manure on arable land. Thus the change in regulation implies that the permit for the holding will no longer cover the spreading of livestock manure which instead will be dealt with through general regulation.

The new separate regulation of the spreading of the livestock manure will generally ensure a level of protection of the environment corresponding to the level of protection ensured by the existing regulation through the specific permits and will consist of the following elements:

Phosphorus

Today, livestock production results in manure generally containing more phosphorus than the actual crop uptake within the crop rotation. When introducing direct regulation for phosphorus application on farmland, it will be ensured that the regulation of phosphorus is in compliance with the objectives of the Nitrates Directive and the Water Framework Directive, concerning reduction of the loss of phosphorus to the aquatic environment. This will be introduced as a general regulation and will thereby no longer be the result of an individual assessment by the local municipalities of a specific livestock holding in connection with granting permits for production.

Erosion of phosphorus

There will be a need to also generally ensure the reduction of loss of phosphorus through erosion. Therefore general requirements will be introduced such as

- use of specific spreading techniques,
- establishing strips along lakes and watercourses, where application of phosphorus is not allowed and/or
- specific requirements regarding tillage
- Others.

Nitrogen

Since the leaching of nitrogen from livestock manure is more pronounced than from commercial fertilizers, a new regulation of the spreading of livestock manure will also include additional requirements to ensure a reduction of nitrogen leaching. This regulation will consist of individual requirements for establishing catch crops designed for each holding based on information from the fertilizer accounting system instead of individual assessments by the local municipalities like today.

As a whole it is the government's aim, that a new, simpler and more flexible regulation of livestock production will ensure regulation in compliance with the Nitrates Directive, the Water Framework Directive and other relating directives and at the same time ensure a less time consuming regulation of high quality to the satisfaction of both farmers and authorities.

Step three – 2018 and onwards

A targeted regulation of nitrogen leaching at farm level

The Danish government currently considers different approaches for deployment of a new mandatory, targeted regulation with effect from 2018, based on the need to further reduce the nitrogen load of each water body. The regulation will be instrumental for the Danish implementation of the Water Framework Directive. Targeted regulation is assumed to reduce nitrogen emissions in total by app. 1.200 tonnes in 2019, rising to app. 3.700 tonnes in 2021. One model for deployment of the regulation is described in the following.

A targeted regulation implies a differentiation of nitrogen regulation depending on geographically defined needs for reducing nitrogen loss to the aquatic environment, including ensuring reduced nitrogen leaching to ground water. The

regulation is expected to be based on the emission of nitrogen at farm level. This will be implemented as an individual limit at farm level to a specific level of nitrogen leaching (kg N) to the root zone per hectare of arable land.

Firstly, an upper limit allowance to nitrogen leaching per catchment area will be calculated for each of the coastal waterbodies that are appointed pursuant to the Water Framework Directive. This will be based on a calculation of the nitrogen retention from root zone to coastal waterbody including model assumptions on soil retention in the catchment area. Secondly at farm level, a calculation will be made of the actual emission from the farm, based on model based calculations on nitrogen loss from the field (root zone retention). The calculated emission from each farm must not exceed the assigned allowance to specific nitrogen leaching at farm level. The fertilizer plan and accounting system that Denmark has already applied for a number of years will be used as the base for control at farm level.

The targeted regulation will ensure a more flexible regulation at farm level. The regulation will be accompanied by a catalogue of relevant measures to reduce nitrogen leaching. This catalogue will enable each farmer to combine a set of measures at farm level which ensure that nitrogen leaching does not exceed the assigned allowance.

DRAFT

Til: helba@mfvm.dk (Helle Bach Rungø (MFVM-DEP))
Fra: Christian Vind (MFVM-DEP) (chvin@mfvm.dk)
Titel: VS: DK envisaged "h1hg level meeting" next week on the ND .WFD implementation
Sendt: 14-12-2015 11:30:13

Fra: Sofus Rex (MFVM-DEP)
Sendt: 11. december 2015 12:06

Til: [REDACTED]@naturerhverv.dk
Cc: STEJEN@naturerhverv.dk; mobh@naturerhverv.dk; MMJ@naturerhverv.dk; [REDACTED] Lars Kolze (NaturErhvervstyrelsen); Louise Plester (NaturErhvervstyrelsen); Christian Vind (MFVM-DEP); Anders Mikkelsen (MFVM-DEP); Lotte Linnet (MFVM-DEP); Jesper Wulff Pedersen (MFVM-DEP); Ida Agnete Balslev (MFVM-DEP); Lidde Bagge Jensen
Emne: SV: DK envisaged "h1hg level meeting" next week on the ND .WFD implementation

Hi [REDACTED]

Thanks and OK – let's go for video conference Wednesday and a follow up at director level January 5th og 6th if possible.

We will forward you a note ASAP.

Best regards and have a nice weekend,

Sofus

Sofus Rex
Head of Department | EU and international affairs
+45 4133 4493 | sofus@mfvm.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfvm@mfvm.dk | www.mfvm.dk

Fra: [REDACTED]
Sendt: 11. december 2015 11:34
Til: magu@naturerhverv.dk; Sofus Rex (MFVM-DEP)
Cc: STEJEN@naturerhverv.dk; mobh@naturerhverv.dk; MMJ@naturerhverv.dk; [REDACTED]
Emne: DK envisaged "h1hg level meeting" next week on the ND .WFD implementation

Marie –FYI
Sofus –referring to the short phone conversation with you this morning,

I have briefed my hierarchy on the information you provided me this morning as regards the political agreement on the way forward on the ND implementation in DK, and the wish to meet next week with the two directors from Dg ENV and [REDACTED]

[REDACTED] considers that even if we would receive a draft description on the politically agreed ideas for the implementation of the ND by the cob today, it would not provide sufficient time to analyse and clarify issues before Wednesday, as it is evident that many parties both in DG ENV and in DG AGRI would be required to discuss. Therefore, a meeting with added value at director level should take place later. Meeting at a technical level could be envisaged, and is considered more beneficial at this stage.

Please, let us know whether you wish to proceed with technical level meeting. If so, whether such meeting would be best "in person" or we would proceed with video conference reservation. We would need this information ASAP, as we would need to coordinate with counterparts in several services.

[REDACTED]
[REDACTED]


European Commission

[REDACTED]
[REDACTED]
[REDACTED]

Notice légale CE DG-AGRI:
Ce message exprime uniquement les points de vue de son auteur et ne saurait en aucun cas être considéré comme une position officielle de la Commission. Il est destiné uniquement à la personne à laquelle il est adressé et pourrait contenir des informations confidentielles. Si vous avez reçu ce message par erreur, merci de m'en avvertir le plus rapidement possible.

Disclaimer CE DG-AGRI:
This message represents solely the views of its author and can not in any circumstances be regarded as the official position of the Commission. It is intended solely for the

To: [REDACTED]
Cc: ruskne@naturerhverv.dk (ruskne@naturerhverv.dk), Robert Busk (NaturErhvervstyrelsen (rbu@naturerhverv.dk), Anne-Mette Laumann Bech (NaturErhvervstyrelsen) (amb@naturerhverv.dk)
Fra: Helle Bach Rungø (helba@mfvm.dk)
Titel: Technical details regarding videoconference meeting
Sendt: 16-12-2015 09:38:08

Dear [REDACTED]

Please find below the technical details regarding our videoconference meeting today the 16th. of December from 17:00 to 18:00:

- Call through "SIP address"(for SIP-compliant equipment): 70008@pdir.dk
- Alternatively:
- Call through IP-address: 83.151.154.76, press 1 followed by 70008 followed by ##

For further technical details please contact: Rusmira Knezevic (e-mail ruskne@naturerhverv.dk, phone 0045 6198 8613) or Robert Busk (e-mail rbu@naturerhverv.dk, phone 0045 4526 3635).

Best regards,

Helle Bach Rungø

Agriculture and Environment
+45 91 36 58 59 | helba@mfvm.dk

Ministry of Environment and Food of Denmark
Ministry Departement | Børgsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mfvm.dk

To: [REDACTED]
Fra: Helle Bach Rungø (helba@mfvm.dk)
Titel: Sv: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 15-12-2015 15:27:08

Dear [REDACTED]

I will get back to you as soon as possible with the below mentioned information.

Best regards,

Helle Bach Rungø
Agriculture and Environment
+45 91 36 58 59 | helba@mfvm.dk

Miljø- og Fødevarerministeriet
Departementet | Børgsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mfvm.dk

To: Helle Bach Rungø (helba@mfvm.dk)
Fra: [REDACTED]
Titel: RE: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 15-12-2015 14:54:47

Dear Helle,

In order to arrange the videoconference I would need technical information such as ISDN number and/or IP address, site to connect and technical contact details: Name , Phone, E-mail of a technical contact person of your site.

Thank you

With best regards



To: [REDACTED]
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP); [REDACTED]
Subject: SV: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear [REDACTED]

Great, I can confirm that we are available for a videoconference tomorrow from 17:00 to 18:00.

Please coordinate the technical details regarding the set-up with Helle Bach Rungø.

Best regards,
Christian Vind

From: [REDACTED]
Sent: 15. december 2015 13:43
To: Christian Vind (MFVM-DEP)
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP); [REDACTED]
Emne: RE: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear Christian Vind,

We would be available for a videoconference tomorrow, Wednesday 16 December, from 17:00 to 18:00. If this date and time is suitable for you, I will then follow up with the technical details to set-up the videoconference.

Best regards

[REDACTED]



[REDACTED]

The views expressed are purely those of the writer and may not in any circumstances be regarded as stating an official position of the European Commission. This message may contain personal and other confidential data that are entrusted to the recipients specified in the header of the message.

From: Christian Vind (MFVM-DEP) [mailto:chvin@mfvm.dk]
Sent: Tuesday, December 15, 2015 8:46 AM
To: [REDACTED]
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP)
Subject: VS: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear [REDACTED]

I have tried to contact you by phone but have not been succesful.

Thus with reference to the enclosed notes on the future regulation of nitrates in Denmark, I would like to enquire whether it would be possible to set up a video conference meeting on Thursday the 17th of December, where we on a technical level can explain our solution and discuss any questions you may have regarding the notes. Our colleagues have already been in contact with [REDACTED] from DG Agri with this proposal, and they are willing to conduct such a meeting in collaboration with you at DG Envi. Please see attached correspondance (please note that Wednesday have changed to Thursday).

In addition to this we have through our permanent representation also proposed a bilateral meeting on the 6th of January 2016 at [REDACTED] level between our Deputy Permanent Secretary Anders Mikkelsen and Director Humberto Delgado-Rosa as a further [REDACTED] on the meeting we had the 27th. of November 2015 as well as on the basis of the more technical video-conference [REDACTED] propose on Thursday.

[REDACTED] aware of the tight schedule, but hope that you may appreciate the relevance of these meetings and thus be able to [REDACTED]

[REDACTED] state to contact me or my colleague, Helle Bach Rungø, with questions both practical and otherwise.

Best regards

Christian Vind
| Landbrug og miljø
+45 41 31 84 87 | chvin@mfvm.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfvm@mfvm.dk | www.mfvm.dk

Til: [REDACTED]
Cc: [REDACTED] Anders Mikkelsen (ami@mfvm.dk),
[REDACTED] Christian Vind (chvin@mfvm.dk), Sofus
Rex (sofur@mfvm.dk), Olsen, Hans Peter (hapor@nst.dk), Lide Bagge Jensen (lidsj@nst.dk), Marie
Guldborg (magu@natureerhverv.dk), Louise Piester (DEP) (louj@fvn.dk), Lars Kolze
(NaturErhvervstyrelsen (LAK@natureerhverv.dk), jakm@natureerhverv.dk (jakm@natureerhverv.dk), Mette
Lise Jensen (melje@nst.dk), Thomas Bruun Jessen (tbr@nst.dk), Jesper Wulff Pedersen (jwp@mfvm.dk)
Fra: Helle Bach Runge (helba@mfvm.dk)
Titel: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 14-12-2015 16:27:19

Dear [REDACTED]

Thank you, [REDACTED] for a very fruitful discussion at the bilateral meeting between the Commission and the Danish delegation on November 27th. And also thanks to DG Agri for a number of very constructive talks.

As background material for a technical discussion, which we are just about to set up with you, we hereby enclose:

- a note on a model for intermediate compensatory measures to avoid increased N emission
- a note on the future regulation of the loss of plant nutrients to the aquatic environment in Denmark

We hope that this material will clarify the key issues of the future regulation of nitrates in Denmark. We look forward to discussing the details of the notes with you, and will contact you shortly with regards to planning of a technical meeting later this week.

Best regards,

Helle Bach Runge
Agriculture and Environment
+45 91 36 58 59 | helba@mfvm.dk

Ministry of Environment and Food of Denmark
Ministry Department | Børgsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mfvm.dk

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Thank you

With best regards



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Sent: Tuesday, December 15, 2015 1:49 PM
To: [REDACTED]
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP); [REDACTED]
Subject: SV: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015 (MFVM Id nr.: 2059850)

Dear [REDACTED]

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Please coordinate the technical details regarding the set-up with Helle Bach Rungø.

Best regards,
Christian Vind

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Sendt: 15. december 2015 13:43
Til: Christian Vind (MFVM-DEP)
Cc: Helle Bach Rungø (MFVM-DEP); Sofus Rex (MFVM-DEP); [REDACTED]
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Best regards



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We are fully aware of the tight schedule, but hope that you may appreciate the relevance of these meetings and thus be able to find the time.

Please do not hesitate to contact me or my colleague, Helle Bach Rungø, with questions both practical and otherwise.

Best regards

Christian Vind

Med venlig hilsen
Best regards

Christian Vind
| Landbrug og miljø
+45 41 31 84 87 | chvin@mfvm.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfvm@mfvm.dk | www.mfvm.dk

Til: [REDACTED]
Cc: [REDACTED] Anders Mikkelsen (ami@mfvm.dk),
Christian Vind (chvin@mfvm.dk), Sofus
Rex (sofur@mfvm.dk), Olsen, Hans Peter (hapol@mst.dk), Lidde Bagge Jensen (ldbj@mst.dk), Marie
Guldborg (magu@natureerhverv.dk), Louise Piester (DEP) (louj@fvm.dk), Lars Koize
(NaturErhvervstyrelsen (LAK@natureerhverv.dk), jakm@natureerhverv.dk (jakm@natureerhverv.dk), Mette
Lise Jensen (melje@nst.dk), Thomas Bruun Jessen (tbr@nst.dk), Jesper Wulff Pedersen (jwp@mfvm.dk)
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Helle Bach Rungø
Agriculture and Environment
+45 91 36 58 59 | helba@mfvn.dk

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Ministry of Environment and Food of Denmark

Danish AgriFish Agency/Nature Agency/Environmental Protection Agency

J.nr. 2015-6878

Date: 10. December 2015

Note

on a model for intermediate compensatory measures to avoid increased N emission

The Danish Government is presently preparing the basis for a political agreement addressing improvement of the production conditions for the Food- and Agricultural business. The political agreement is expected to result in a new and more targeted way of regulating nitrates in Denmark in the future, expected to be in place in 2018. Key elements in the political agreement are lifting the reduced general fertilization standards for nitrogen to the level of economic optimum, annulment of the statutory buffer strips along lakes and watercourses and a minor adjustment of the, prohibition on soil tillage in the autumn.

The general fertilization standards for nitrogen and the current reduction of these standards to a level below economic optimum are currently part of the Danish implementation of the Nitrates Directive, and thereby also the Danish implementation of the Water Framework Directive.

Lifting the reduced standards to the economic optimum level and the annulment of the requirement for mandatory buffer strips will result in an increased loss of nitrogen to the aquatic environment. The increased loss of nitrogen will be countered by compensatory measures in order to ensure an adequate implementation of the Nitrates Directive and Water Framework Directive.

The model to avoid deterioration of the aquatic environment (surface waters and groundwater) will be presented in the following.

Table 1 shows the expected need for further measures to compensate the increased loss of nitrogen to surface waters in the period 2016-2018 (based upon scientific calculations). It is assumed that the reduced fertilization standards will be increased by two thirds in 2015-2016 and by one third in 2016-2017, thus the standards will represent the economic optimum in 2016-2017.

The need for further measures in each individual year is based on a recent recalculation of the nitrogen load. The baseline for 2013-2015 is deducted in the calculation and reflected in the increased load of nutrients to individual coastal water bodies.

The figures in table 1 is based on the following decisions and calculations:

- The increased loss of nitrogen resulting from the annulment of the buffer strips (approx. 725 tonnes N),

- The increased loss of nitrogen resulting from lifting the reduced general nitrogen fertilization standards (approx. 2.740 tonnes N in 2016 increasing to 4.350 tonnes N in 2018), and
- The development of the baseline (accumulation of the effect of measures already in place, structural development etc.) contributing to the reduced loss of nitrogen.

Table 1. Intermediate need for further nitrogen reduction in 2016-2018 resulting from increased N emission to surface waters

Year	2016	2017	2018
Need for further nitrogen reduction to avoid deterioration (tonnes N)	915	1395	1004

Note: The consequences for groundwater are not reflected in the table. The figures are aggregated at national level, and variation at coastal water level is possible.

A new targeted N-regulation is expected to ensure a sufficient protection of the surface waters from 2018. The targeted N-regulation will be explained further in a separate document, to be presented to the commission.

Measures in an intermediate compensatory model

To avoid deterioration of surface waters and groundwater the Danish Government has ensured the financing and legal basis for two intermediate compensatory environmental initiatives. On a short term basis (2016-2018) it is generally expected to be possible to target measures to avoid deterioration locally, and on a long term basis (2019-2021) the initiatives – combined with the targeted regulation – are expected to ensure a gradual improvement of the aquatic environment.

The model to avoid deterioration in the period 2016-2018 is presented in table 2 below. The model includes the following regulatory initiatives:

- Changes in national regulation of mandatory catch crops.
- Subsidy schemes to establish wetlands, mini-wetlands and afforestation, Land lease schemes with cultivation restrictions, ensuring establishment of additional catch crops.

In 2016 the increased load of nitrogen beyond baseline 2013-2015 to surface waters will be partly compensated by N-reducing measures in national legislation working in combination with the chosen EFA-types in Denmark to fulfill the greening requirement of Ecological Focus Areas (EFA) in the CAP. Further analysis is required to establish to what level each individual regulatory initiative addresses the deterioration of the groundwater status and how these can be targeted against deterioration (see further below).

Table 2 - Intermediate compensatory initiatives (additional need for nitrogen reduction, as in table 1, and N-reducing impact in tonnes per year in surface waters)

Year	2016	2017	2018	I
Need for nitrogen reduction to avoid deterioration (tonnes N in surface waters)	915	1395	1004	
N-reducing measures				
Changes in regulation of national mandatory catch crops	1197	867	867	
Additional establishment of mini-wetlands, wetlands, afforestation (RDP-financed)		107	221	
Land lease with cultivation restrictions resulting in extra catch crops		818	693	
Total	- 282	- 397	- 777	

Note: It is assumed that land lease with cultivation restrictions will be carried out on 85.500 hectares in 2017 and 72.500 hectares in 2018. The scope of the initiative is targeted to ensure an impact on groundwater as well.

Influence on groundwater

The changes to the nitrogen regulation as described above will - all else being equal - increase the amount of nitrates in the groundwater. The compensatory initiatives are expected to ensure that there is no deterioration of the aquatic environment, ie. surface waters. These initiatives will also counter deterioration of ground water quality. However, since there is no certain one-to-one correlation between initiatives that counter deterioration of the quality of the surface water and the quality of the groundwater, the risk of deterioration of the groundwater can currently not be fully eliminated.

The Ministry of Environment and Food are therefore currently investigating solutions and data concerning groundwater. The Geological survey of Denmark and Greenland is currently evaluating in detail the groundwater status and the geographic distribution of necessary compensatory measures in relation to groundwater. The full evaluation will be completed in June 2016.

The preliminary assessment is that there will be a particular need for compensatory measures in geographical areas related to areas of groundwater, in which the quality standard for nitrate

(75%) is close to being exceeded or have a significant and sustained upward trend above 75% of the quality requirement regarding nitrate. It is expected that from areas where there is relatively little nitrogen loss to surface waters because the soil on the areas will withhold a larger proportion of nitrogen, nitrogen will to a certain degree leach into groundwater.

The changes to national regulation of catch-crops on farmland are expected to have an impact on groundwater. In addition, the land lease model (described below) will be targeted groundwater in order to avoid deterioration of groundwater and reverse any significant and sustained rising trends of nitrate in the groundwater.

Changes in regulation of the establishment of national mandatory catch-crops

As a condition for receiving the green payment under the CAP direct payments, farmers must comply with three greening requirements, including the requirement of ecological focus areas (EFA) on 5 per cent of the arable land on each farm. To increase the effect of a national requirement of 240.000 ha of catch crops and the EFA-areas, a flexibility given to farmers whereby they can use some EFA-areas as an alternative to the national catch crops will be removed.

A total EFA area of approximately 105,000 hectares is needed in Denmark to comply with the 5 per cent requirement. According to Danish legislation, the EFA area can be established by buffer strips, catch crops, fallow land, coppice and landscape elements. The mandatory buffer strips cf. the national Law on mandatory buffer zones contributes to EFA with approximately 24,000 EFA-hectares today.

According to the proposal by the government to repeal the requirement of additional buffer strips, which has recently been presented in parliament, the farmer can choose to apply other EFA-measures than buffer strips, to meet the EFA requirement. The alternative measures will have a positive effect on reduction of nitrogen leaching in so far as they were not already established before the annulment of the law on mandatory buffer strips. This will offset entirely the increased nitrogen loss resulting from the annulment of the law.

It is expected that farmers will mainly fulfil their resulting need for additional EFA requirements by establishing extra catch crops, maintaining existing buffer strips voluntarily or lay land fallow.

According to continued national legislation farmers must establish 240.000 ha of catch crops. At present farmers are given a flexibility to replace establishment of catch crops required by the Order on Plant Cover with alternative measures such as elements included in the EFA-measures (fallow land and coppice). In order to ensure the best possible nitrogen-reducing impact of the greening requirements, the flexibility on catch crops in the Order on Plant Cover will be removed. By not allowing farmers to replace mandatory catch crops with EFA elements such as laying land fallow or establishing coppice, the full effect on reduction of nitrogen loss is obtained for both mandatory catch crops and the EFA requirement. These elements will have a full nitrogen reducing effect, also in future years.

The Ministry of Environment and Food estimates that the changes could result in a number of different combinations of buffer strips and catch crops with a significant effect on N-leaching,

for instance; 70.000 hectares additional EFA- catch crops and the maintaining of 4.000 hectares additional buffer strips that would otherwise be removed.

The effect of the changes to national regulation of mandatory catch crops is estimated to be a reduced nitrogen loss of 1,197 tonnes N in 2016 and 867 tonnes N in both 2017 and 2018. Since the initiative is mandatory for farmers, the effect is certain and will be permanent.

The changes will provide a reduction of nitrogen loss to both surface waters and groundwater. They will be implemented through revision of the Danish Order on Plant Cover with effect from August 2016. This will not affect the Danish implementation of the greening requirements pursuant to REG (EU) 1307/2013.

Land lease with cultivation restrictions of sowing of catch crops

The Danish government will establish a new land lease scheme for 2017-2018 in order to prevent further nitrogen loss. In the scheme, the state leases farmland on a voluntary basis, imposes nitrogen-reducing cultivation restrictions on the land, such as requirements for catch crops, and then possibly re-leases it to a farmer for a limited period.

It is estimated that the scheme in 2017 will ensure a reduced nitrogen loss to the marine environment of 421 tonnes N. In order to achieve this effect in 2017, it is estimated that the state must lease between 30,000 and 90,000 hectares or up to 4 per cent of the farmed land. The leasing scheme shall work on market terms. Therefore, the economic compensation for farmers will solely be equal to the operating loss endured as a result of the restrictions on the land.

Further there is a need for an effort to sufficiently ensure the protection of the groundwater. The current analysis indicates that it will require a land lease scheme with cultivation restrictions ensuring reduction of nitrogen loss amounting to additional 818 tonnes N in 2017 and 696 tonnes N in 2018 to avoid deterioration of the groundwater status in 2017-2018. The scope of the need will as previously mentioned be further investigated by The Geological survey of Denmark and Greenland in the beginning of 2016 and assessed by June 2016, and the Ministry of Environment and Food is currently assessing various solutions to prevent deterioration in 2016 of the groundwater. A new targeted regulation is expected to ensure a sufficient protection of the groundwater after 2018.



**Ministry of Environment
and Food of Denmark**
Environmental
Protection Agency

Danish EPA Commerce,
Industry and Agriculture
J.nr. 001-13962
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December 10 2015

The future regulation of the loss of plant nutrients to the aquatic environment in Denmark

The future regulation of nitrates and phosphorous in Denmark is expected to be implemented in three steps. The three steps cover three different periods, *Step one – from 2016 to 2018, Step two – from 2017 and onwards* and finally *Step three – from 2018 and onwards*. The three steps will be described in the following paragraphs.

Step one – 2016-2018

Short term changes of the regulation of nitrates

Regarding the short term changes of the regulation of nitrates, the regulation is described in the Note on a model for intermediate compensatory measures to avoid increased N emission, dated December 10th, 2015.

Step two – 2017 and onwards

Levelling the harmony rules and ensuring a more direct way of regulating phosphorous in a new regulation of livestock holdings

Coming into effect from 2017, the Danish government wishes to align the "harmony rules" for slaughter pigs, to ensure that the requirement is aligned with the requirement of the Nitrates Directive that specifies the amount of livestock manure per hectare to 170 kg N/ha, corresponding to 1.7 LU/ha. This means that the harmony rules' limit for holdings producing slaughter pigs will be lifted from 1.4 LU/ha to 1.7 LU/ha.

Harmony rules set requirements for the minimum size of the area a livestock holding must have available for spreading livestock manure from the respective livestock production. The requirement is defined as a limitation in livestock units per hectare (LU/ha), based on the content of nitrogen in the respective livestock manure (ex storage). Thereby the harmony rules implement the Nitrates Directive's requirement to limit the amount of manure per hectare to 170 kg N, corresponding to 1.7 LU/ha. Since 2002, Denmark has imposed a tightened requirement for holdings producing pigs, poultry and fur bearing animals, as the harmony rule for these categories of livestock productions has been adjusted to 1.4 LU/ha.

It is necessary to emphasize that harmony rules do not regulate the size of livestock productions as such. They contribute to the management of the environmental impact from livestock production and are regulated through national legislation dealing with and issuing permits for livestock production. So even when the harmony rule is adjusted from 1.4 LU/ha to the Nitrates Directives limit of 1.7 LU/ha, an increase in livestock production at specific holdings would require a specific permit.

By defining the harmony rules as a limitation of livestock units per hectare, an indirect limitation of application of phosphorus from livestock manure is ensured. Hence, Denmark has no direct general limitation of application of phosphorus from livestock manure.

Nevertheless, application of phosphorus is regulated in connection with environmental permits issued for livestock holdings. When granting a permit, the local municipalities will assess the environmental impact of the specific livestock holding. This assessment also covers the application of phosphorus from livestock manure and may result in limitation of phosphorus surplus for specific areas of the respective livestock holding.

Levelling the harmony rules for slaughter pigs from 1.4 LU/ha to 1.7 LU/ha will result in a larger amount of livestock manure applied to the arable areas of these livestock holdings. To ensure that this higher concentration of livestock manure does not compromise the reduction of phosphorus surplus in certain areas, a new and direct regulation of the application of phosphorus from livestock manure will be implemented simultaneously with lifting the harmony rules.

This new regulation of phosphorus (e.g. through phosphorus limits) is a prerequisite for an expected new and more emission-based regulation of livestock productions.

A new and more emission based regulation of livestock holdings

The Danish government will propose a new and more emission based regulation of livestock holdings when granting permits to installations for animal husbandry. The regulation will ensure a simpler and more flexible regulation designed as a permit based on an environmental assessment of the production area in the stable, rather than the number of animals produced in the stable. Besides being simpler and easier to enforce and control, this method targets the emissions of ammonia from livestock holdings in a more precise way.

As a prerequisite for this emission based regulation of permits for installations for animal husbandry the Danish government will propose a separate regulation of the actual installations for the animal production sites (stables, storage vessels i.e.) and the regulation of the spreading of the livestock manure on arable land. Thus the change in regulation implies that the permit for the holding will no longer cover the spreading of livestock manure which instead will be dealt with through general regulation.

The new separate regulation of the spreading of the livestock manure will generally ensure a level of protection of the environment corresponding to the level of protection ensured by the existing regulation through the specific permits and will consist of the following elements:

Phosphorus

Today, livestock production results in manure generally containing more phosphorus than the actual crop uptake within the crop rotation. When introducing direct regulation for phosphorus application on farmland, it will be ensured that the regulation of phosphorus is in compliance with the objectives of the Nitrates Directive and the Water Framework Directive, concerning reduction of the loss of phosphorus to the aquatic environment. This will be introduced as a general regulation and will thereby no longer be the result of an individual assessment by the local municipalities of a specific livestock holding in connection with granting permits for production.

Erosion of phosphorus

There will be a need to also generally ensure the reduction of loss of phosphorous through erosion. Therefore general requirements will be introduced such as

- use of specific spreading techniques,
- establishing strips along lakes and watercourses, where application of phosphorous is not allowed and/or
- specific requirements regarding tillage
- Others.

Nitrogen

Since the leaching of nitrogen from livestock manure is more pronounced than from commercial fertilizers, a new regulation of the spreading of livestock manure will also include additional requirements to ensure a reduction of nitrogen leaching. This regulation will consist of individual requirements for establishing catch crops designed for each holding based on information from the fertilizer accounting system instead of individual assessments by the local municipalities like today.

As a whole it is the government's aim, that a new, simpler and more flexible regulation of livestock production will ensure regulation in compliance with the Nitrates Directive, the Water Framework Directive and other relating directives and at the same time ensure a less time consuming regulation of high quality to the satisfaction of both farmers and authorities.

Step three – 2018 and onwards

A targeted regulation of nitrogen leaching at farm level

The Danish government currently considers different approaches for deployment of a new mandatory, targeted regulation with effect from 2018, based on the need to further reduce the nitrogen load of each water body. The regulation will be instrumental for the Danish implementation of the Water Framework Directive. Targeted regulation is assumed to reduce nitrogen emissions in total by app. 1.200 tonnes in 2019, rising to app. 3.700 tonnes in 2021. One model for deployment of the regulation is described in the following.

A targeted regulation implies a differentiation of nitrogen regulation depending on geographically defined needs for reducing nitrogen loss to the aquatic environment, including ensuring reduced nitrogen leaching to ground water. The

1

regulation is expected to be based on the emission of nitrogen at farm level. This will be implemented as an individual limit at farm level to a specific level of nitrogen leaching (kg N) to the root zone per hectare of arable land.

Firstly, an upper limit allowance to nitrogen leaching per catchment area will be calculated for each of the coastal waterbodies that are appointed pursuant to the Water Framework Directive. This will be based on a calculation of the nitrogen retention from root zone to coastal waterbody including model assumptions on soil retention in the catchment area. Secondly at farm level, a calculation will be made of the actual emission from the farm, based on model based calculations on nitrogen loss from the field (root zone retention). The calculated emission from each farm must not exceed the assigned allowance to specific nitrogen leaching at farm level. The fertilizer plan and accounting system that Denmark has already applied for a number of years will be used as the base for control at farm level.

The targeted regulation will ensure a more flexible regulation at farm level. The regulation will be accompanied by a catalogue of relevant measures to reduce nitrogen leaching. This catalogue will enable each farmer to combine a set of measures at farm level which ensure that nitrogen leaching does not exceed the assigned allowance.

DRAFT

Til: Helle Bach Rungø (helba@mfvm.dk)
Fra: Christian Vind (chvin@mfvm.dk)
Titel: VS: DK envisaged "hihg level meeting" next week on the ND .WFD implementation
Sendt: 14-12-2015 11:30:13

Fra: Sofus Rex (MFVM-DEP)
Sendt: 11. december 2015 12:06
Til: [redacted]@erhverv.dk
Cc: STEJEN@naturehverv.dk; mobh@naturehverv.dk; MMJ@naturehverv.dk; [redacted] Lars Kolze (NaturErhvervstyrelsen); Louise Piester (NaturErhvervstyrelsen); Christian Vind (MFVM-DEP); Anders Mikkelsen (MFVM-DEP); Lotte Linnet (MFVM-DEP); Jesper Wulff Pedersen (MFVM-DEP); Ida Agnete Balslev (MFVM-DEP); Lilde Bagge Jensen
Emne: SV: DK envisaged "hihg level meeting" next week on the ND .WFD Implementation

Hi [redacted]

Thanks and OK – let's go for video conference Wednesday and a follow up at director level January 5th og 6th if possible.

We will forward you a note ASAP.

Best regards and have a nice weekend,

Sofus

Sofus Rex
Head of Department | EU and international affairs
+45 4133 4493 | sofur@mfvm.dk

Ministry of Environment and Food
The Department | Slotsholmsgade 12, 1216 Copenhagen K | Tlf. +45 33 92 33 01 | mfvm@mfvm.dk | www.mfvm.dk

Fra: [redacted]
Sendt: 11. december 2015 11:34
Til: magu@naturehverv.dk; Sofus Rex (MFVM-DEP)
Cc: STEJEN@naturehverv.dk; mobh@naturehverv.dk; MMJ@naturehverv.dk; [redacted]
Emne: DK envisaged "hihg level meeting" next week on the ND .WFD implementation

Marie –FYI
Sofus –referring to the short phone conversation with you this morning,

I have briefed my hierarchy on the information you provided me this morning as regards the political agreement on the way forward on the ND implementation in DK, and the wish to meet next week with the two directors from Dg ENV and [redacted]

[redacted] considers that even if we would receive a draft description on the politically agreed ideas for the implementation of the ND by the cob today, it would not provide sufficient time to analyse and clarify issues before Wednesday, as it is evident that many parties both in DG ENV and in DG AGRI would be required to discuss. Therefore, a meeting with added value at director level should take place later.
Meeting at a technical level could be envisaged, and is considered more beneficial at this stage.

Please, let us know whether you wish to proceed with technical level meeting. If so, whether such meeting would be best "in person" or we would proceed with video conference reservation. We would need this information ASAP, as we would need to coordinate with counterparts in several services.

[redacted]

[redacted]



European Commission

[redacted]

[redacted]

Notice légale CE DG-AGRI:

Ce message exprime uniquement les points de vue de son auteur et ne saurait en aucun cas être considéré comme une position officielle de la Commission. Il est destiné uniquement à la personne à laquelle il est adressé et pourrait contenir des informations confidentielles. Si vous avez reçu ce message par erreur, merci de m'en avvertir le plus rapidement possible.

Disclaimer CE DG-AGRI:

This message represents solely the views of its author and can not in any circumstances be regarded as the official position of the Commission. It is intended solely for the

Til: [REDACTED]
Cc: [REDACTED] Anders Mikkelsen (ami@mfvn.dk), [REDACTED]
Christian Vind (chvin@mfvn.dk), Sofus Rex (sofur@mfvn.dk), Olsen, Hans Peter (hapor@mst.dk), Lidde Bagge
Jensen (ldbj@mst.dk), Marie Guldborg (magu@naturerhverv.dk), Louise Piester (DEP) (louj@fvn.dk), Lars Kolze (NaturErhvervstyrelsen
(LAK@naturerhverv.dk), jakm@naturerhverv.dk (jakm@naturerhverv.dk), Mette Lise Jensen (melje@nst.dk), Thomas Bruun Jessen (tbr@nst.dk),
Jesper Wulff Pedersen (jwp@mfvn.dk)
Fra: Helle Bach Rungø (helba@mfvn.dk)
Titel: Follow up on bilateral meeting with the Commission on Nitrate Action Programme november 27.th 2015
Sendt: 14-12-2015 16:27:19
Bilag: Bilag 1 Note on model for intermediate compulsory measures dep MST NST N....docx; Bilag 2 New regulation in Denmark in three steps 101215 naer
nst-3.docx;

Dear [REDACTED]

Thank you [REDACTED] for a very fruitful discussion at the bilateral meeting between the Commission and the Danish delegation on November 27th. And also thanks to DG Agri for a number of very constructive talks.

As background material for a technical discussion, which we are just about to set up with you, we hereby enclose:

- a note on a model for intermediate compensatory measures to avoid increased N emission
- a note on the future regulation of the loss of plant nutrients to the aquatic environment in Denmark

We hope that this material will clarify the key issues of the future regulation of nitrates in Denmark. We look forward to discussing the details of the notes with you, and will contact you shortly with regards to planning of a technical meeting later this week.

Best regards,

Helle Bach Rungø
Agriculture and Environment
+45 91 36 58 59 | helba@mfvn.dk

Ministry of Environment and Food of Denmark
Ministry Department | Børgsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mfvn.dk

Ministry of Environment and Food of Denmark

Danish AgriFish Agency/Nature Agency/Environmental Protection Agency

J.nr. 2015-6878

Date: 10. December 2015

Note

on a model for intermediate compensatory measures to avoid increased N emission

The Danish Government is presently preparing the basis for a political agreement addressing improvement of the production conditions for the Food- and Agricultural business. The political agreement is expected to result in a new and more targeted way of regulating nitrates in Denmark in the future, expected to be in place in 2018. Key elements in the political agreement are lifting the reduced general fertilization standards for nitrogen to the level of economic optimum, annulment of the statutory buffer strips along lakes and watercourses and a minor adjustment of the, prohibition on soil tillage in the autumn.

The general fertilization standards for nitrogen and the current reduction of these standards to a level below economic optimum are currently part of the Danish implementation of the Nitrates Directive, and thereby also the Danish implementation of the Water Framework Directive.

Lifting the reduced standards to the economic optimum level and the annulment of the requirement for mandatory buffer strips will result in an increased loss of nitrogen to the aquatic environment. The increased loss of nitrogen will be countered by compensatory measures in order to ensure an adequate implementation of the Nitrates Directive and Water Framework Directive.

The model to avoid deterioration of the aquatic environment (surface waters and groundwater) will be presented in the following.

Table 1 shows the expected need for further measures to compensate the increased loss of nitrogen to surface waters in the period 2016-2018 (based upon scientific calculations). It is assumed that the reduced fertilization standards will be increased by two thirds in 2015-2016 and by one third in 2016-2017, thus the standards will represent the economic optimum in 2016-2017.

The need for further measures in each individual year is based on a recent recalculation of the nitrogen load. The baseline for 2013-2015 is deducted in the calculation and reflected in the increased load of nutrients to individual coastal water bodies.

The figures in table 1 is based on the following decisions and calculations:

- The increased loss of nitrogen resulting from the annulment of the buffer strips (approx. 725 tonnes N),

- The increased loss of nitrogen resulting from lifting the reduced general nitrogen fertilization standards (approx. 2.740 tonnes N in 2016 increasing to 4.350 tonnes N in 2018), and
- The development of the baseline (accumulation of the effect of measures already in place, structural development etc.) contributing to the reduced loss of nitrogen.

Table 1. Intermediate need for further nitrogen reduction in 2016-2018 resulting from increased N emission to surface waters

Year	2016	2017	2018
Need for further nitrogen reduction to avoid deterioration (tonnes N)	915	1395	1004

Note: The consequences for groundwater are not reflected in the table. The figures are aggregated at national level, and variation at coastal water level is possible.

A new targeted N-regulation is expected to ensure a sufficient protection of the surface waters from 2018. The targeted N-regulation will be explained further in a separate document, to be presented to the commission.

Measures in an intermediate compensatory model

To avoid deterioration of surface waters and groundwater the Danish Government has ensured the financing and legal basis for two intermediate compensatory environmental initiatives. On a short term basis (2016-2018) it is generally expected to be possible to target measures to avoid deterioration locally, and on a long term basis (2019-2021) the initiatives – combined with the targeted regulation – are expected to ensure a gradual improvement of the aquatic environment.

The model to avoid deterioration in the period 2016-2018 is presented in table 2 below. The model includes the following regulatory initiatives:

- Changes in national regulation of mandatory catch crops.
- Subsidy schemes to establish wetlands, mini-wetlands and afforestation, Land lease schemes with cultivation restrictions, ensuring establishment of additional catch crops.

In 2016 the increased load of nitrogen beyond baseline 2013-2015 to surface waters will be partly compensated by N-reducing measures in national legislation working in combination with the chosen EFA-types in Denmark to fulfill the greening requirement of Ecological Focus Areas (EFA) in the CAP. Further analysis is required to establish to what level each individual regulatory initiative addresses the deterioration of the groundwater status and how these can be targeted against deterioration (see further below).

Table 2 - Intermediate compensatory initiatives (additional need for nitrogen reduction, as in table 1, and N-reducing impact in tonnes per year in surface waters)

Year	2016	2017	2018	I
Need for nitrogen reduction to avoid deterioration (tonnes N in surface waters)	915	1395	1004	
N-reducing measures				
Changes in regulation of national mandatory catch crops	1197	867	867	
Additional establishment of mini-wetlands, wetlands, afforestation (RDP-financed)		107	221	
Land lease with cultivation restrictions resulting in extra catch crops		818	693	
Total	- 282	- 397	- 777	

Note: It is assumed that land lease with cultivation restrictions will be carried out on 85.500 hectares in 2017 and 72.500 hectares in 2018. The scope of the initiative is targeted to ensure an impact on groundwater as well.

Influence on groundwater

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Levelling the harmony rules for slaughter pigs from 1.4 LU/ha to 1.7 LU/ha will result in a larger amount of livestock manure applied to the arable areas of these livestock holdings. To ensure that this higher concentration of livestock manure does not compromise the reduction of phosphorus surplus in certain areas, a new and direct regulation of the application of phosphorus from livestock manure will be implemented simultaneously with lifting the harmony rules.

This new regulation of phosphorus (e.g. through phosphorus limits) is a prerequisite for an expected new and more emission-based regulation of livestock productions.

A new and more emission based regulation of livestock holdings

The Danish government will propose a new and more emission based regulation of livestock holdings when granting permits to installations for animal husbandry. The regulation will ensure a simpler and more flexible regulation designed as a permit based on an environmental assessment of the production area in the stable, rather than the number of animals produced in the stable. Besides being simpler and easier to enforce and control, this method targets the emissions of ammonia from livestock holdings in a more precise way.

As a prerequisite for this emission based regulation of permits for installations for animal husbandry the Danish government will propose a separate regulation of the actual installations for the animal production sites (stables, storage vessels i.e.) and the regulation of the spreading of the livestock manure on arable land. Thus the change in regulation implies that the permit for the holding will no longer cover the spreading of livestock manure which instead will be dealt with through general regulation.

The new separate regulation of the spreading of the livestock manure will generally ensure a level of protection of the environment corresponding to the level of protection ensured by the existing regulation through the specific permits and will consist of the following elements:

Phosphorus

Today, livestock production results in manure generally containing more phosphorus than the actual crop uptake within the crop rotation. When introducing direct regulation for phosphorus application on farmland, it will be ensured that the regulation of phosphorus is in compliance with the objectives of the Nitrates Directive and the Water Framework Directive, concerning reduction of the loss of phosphorus to the aquatic environment. This will be introduced as a general regulation and will thereby no longer be the result of an individual assessment by the local municipalities of a specific livestock holding in connection with granting permits for production.

Erosion of phosphorus

There will be a need to also generally ensure the reduction of loss of phosphorus through erosion. Therefore general requirements will be introduced such as

- use of specific spreading techniques,
- establishing strips along lakes and watercourses, where application of phosphorus is not allowed and/or
- specific requirements regarding tillage
- Others.

Nitrogen

Since the leaching of nitrogen from livestock manure is more pronounced than from commercial fertilizers, a new regulation of the spreading of livestock manure will also include additional requirements to ensure a reduction of nitrogen leaching. This regulation will consist of individual requirements for establishing catch crops designed for each holding based on information from the fertilizer accounting system instead of individual assessments by the local municipalities like today.

As a whole it is the government's aim, that a new, simpler and more flexible regulation of livestock production will ensure regulation in compliance with the Nitrates Directive, the Water Framework Directive and other relating directives and at the same time ensure a less time consuming regulation of high quality to the satisfaction of both farmers and authorities.

Step three – 2018 and onwards

A targeted regulation of nitrogen leaching at farm level

The Danish government currently considers different approaches for deployment of a new mandatory, targeted regulation with effect from 2018, based on the need to further reduce the nitrogen load of each water body. The regulation will be instrumental for the Danish implementation of the Water Framework Directive. Targeted regulation is assumed to reduce nitrogen emissions in total by app. 1.200 tonnes in 2019, rising to app. 3.700 tonnes in 2021. One model for deployment of the regulation is described in the following.

A targeted regulation implies a differentiation of nitrogen regulation depending on geographically defined needs for reducing nitrogen loss to the aquatic environment, including ensuring reduced nitrogen leaching to ground water. The

regulation is expected to be based on the emission of nitrogen at farm level. This will be implemented as an individual limit at farm level to a specific level of nitrogen leaching (kg N) to the root zone per hectare of arable land.

Firstly, an upper limit allowance to nitrogen leaching per catchment area will be calculated for each of the coastal waterbodies that are appointed pursuant to the Water Framework Directive. This will be based on a calculation of the nitrogen retention from root zone to coastal waterbody including model assumptions on soil retention in the catchment area. Secondly at farm level, a calculation will be made of the actual emission from the farm, based on model based calculations on nitrogen loss from the field (root zone retention). The calculated emission from each farm must not exceed the assigned allowance to specific nitrogen leaching at farm level. The fertilizer plan and accounting system that Denmark has already applied for a number of years will be used as the base for control at farm level.

The targeted regulation will ensure a more flexible regulation at farm level. The regulation will be accompanied by a catalogue of relevant measures to reduce nitrogen leaching. This catalogue will enable each farmer to combine a set of measures at farm level which ensure that nitrogen leaching does not exceed the assigned allowance.

DRAFT

Til: Christian Vind (chvin@mfv.dk)
Cc: Ida Agnete Balslev (idaba@mfv.dk)
Fra: Helle Bach Rungø (helba@mfv.dk)
Titel: Vs: follow-up - questions to the Danish presentations - Nitrates Committee 02 Oct 2015
Sendt: 19-10-2015 10:04:09
Bilag: Trend in nitrate concentration in shallow ground water in Denmark_FINAL_20151008.pdf;

Kære Christian,

Til din orientering har MST sendt nedenstående svar til KOM på nogle få fakta-spørgsmål som blev rejst på det første møde i nitratkomiteen d. 2. okt. bl.a. om nitratkoncentration i nyt og gammelt grundvand (KOM var interesseret i tendenser ift. det nye) jf. vedhæftning samt yderligere oplysninger om kontrolbesøg på henholdsvis undtagelsesbrug og ikke-undtagelsesbrug.

Ida - jeg sender også denne til dig, idet det vedhæftede dok. fra Århus Uni om grundvand også kan have din interesse, og gerne skulle stemme overens med dine oplysninger på grundvand.

Med venlig hilsen

Helle Bach Rungø
Landbrug og Miljø
+45 91 36 58 59 | helba@mim.dk

Miljø- og Fødevarerministeriet
Departementet | Børsgade 4 | 1215 København K | Tlf. +45 72 54 60 00 | mim@mim.dk | www.mfv.dk

Til: [redacted]
Cc: jakm@naturerhverv.dk (jakm@naturerhverv.dk), Poul Hofmänn (NaturErhvervstyrelsen) (PHOF@naturerhverv.dk), pbe@naturerhverv.dk (pbe@naturerhverv.dk), Helle Bach Rungø (helba@mfv.dk), Lidde Bagge Jensen (lbbj@mst.dk), Majken Seerup Schmidt (NaturErhvervstyrelsen) (MSS@naturerhverv.dk), Olsen, Hans Peter (hapol@mst.dk)
Fra: Wibke Christel (wibch@mst.dk)
Titel: follow-up - questions to the Danish presentations - Nitrates Committee 02 Oct 2015
Sendt: 14-10-2015 11:37:52

Dear [redacted]

Once again, thank you very much for an interesting meeting in the Nitrates Committee on the 2nd of October 2015!

In connection with the Danish presentations, a few questions were raised by the members of the Commission, which we hereby would like to address. We have collected the respective information from the relevant research institutions and our colleagues in the Danish AgriFish Agency, respectively, who are responsible for the farm inspections.

With respect to water quality and the demanded disaggregated data on the Nitrate concentration levels in oxic groundwater of different age, we would like to refer to the statement by Gitte Blicher-Mathiesen (DCE, Aarhus University), supported by data from the Geological Survey of Denmark (GEUS), which you can find attached to this e-mail.

Regarding the administration and thereby the share of agricultural holdings with fertilizer accounts and control-data from farms with and without use of the derogation, our colleagues from the AgriFish Agency have provided the following information:

Table 1: Agricultural holdings with fertilizer accounts

Year	2012	2013
Number of agricultural holdings that applied for Single payment	45,682	44,377
Number of holdings with fertilizer accounts	42,325	39,875
Percentage of agricultural holdings with fertilizer accounts [%]	92.7	89.9

The number of findings of violations at holdings using the derogation, granted by the Commission in decision 2012/659 concerning cattle farms' use of livestock manure compared to the number of findings of violations at all holdings:

(The information is given for the crop-season 2011/2012, as the control is not yet finished for the crop season 2012/2013)

Table 2: Number of holdings, number of inspections and number and holdings using the Danish derogation (2011/2012)

	All holdings	Holdings with derogation	Holdings not using the derogation
Number of agricultural holdings with fertilizer accounts	42,325	1,652	40,673
Number of inspections	1,518	141	1,377
Number of inspections with findings of violations	102	2	100
Inspections with findings of violations [%]	6.7	1.4	7.3

Please do not hesitate to get back to us in case of any supplementary questions and/or if any of the provided information are unclear or insufficient, respectively!

Best regards from Denmark

Wibke Christel
Technical Administrator, PhD | Agriculture
+45 72 54 41 48 | wibch@mst.dk

Ministry of Environment and Food



Request from:
NITRATES DIRECTIVE 91/676/EEC
61st Committee Meeting – Brussels 2/10/2015

Documentation of trend in nitrate concentration in shallow groundwater in Denmark

Monitoring of shallow groundwater in Denmark

Measured nitrate concentrations in oxic groundwater from 152 groundwater wells in Denmark have been evaluated for trends. The groundwater sampling was performed from 1988 to 2009 and the age of the groundwater was determined by the CFC dating method.

The dating showed that the groundwater was formed in the period from 1952 to 2003 and the analysed groundwater was divided in three groups: i) 0-15 years, ii) 15-25 years and iii) 25-50 years.

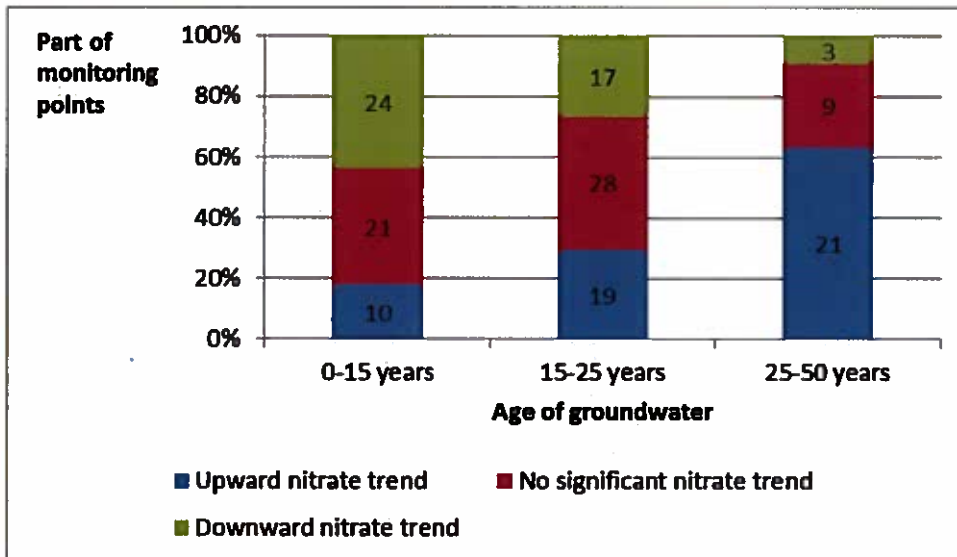


Figure 1. Trend in nitrate concentrations in oxic groundwater with three different ages: 0-15, 15-25 and 25-50 years old. Data is from 152 groundwater monitoring points. Number of monitoring points is shown in each group (Hansen et al., 2011 & 2012).

Catchment Science and
Environmental Management

Gitte Blicher-Mathlesen

Senior Advisor

Date: 08 October 2015

Direct tel.: +45 87158769
E-mail: gbm@bios.au.dk

Web:
<http://au.dk/en/gbm@bios>

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A linear regression analysis showed a decreasing nitrate trend in 44% of the wells with the youngest groundwater (0-15 years) and in 9% of the wells with relatively old groundwater (25-50 years) (Figure 1). Increasing trends in nitrate concentrations predominantly occurred in groundwater that was 25-50 years old, 64% of the analysed wells with the oldest groundwater showed increasing nitrate trends compared to only 18% of the samples in the youngest groundwater. This pattern with increasing trends in old groundwater is probably due to the legacy of higher nitrogen surpluses and N leaching 25-50 years ago in Denmark.

Monitoring of very shallow groundwater is currently based on measurements at near-surface groundwater monitoring points, approximately 100 wells located from 1.5 to 5 metres below the surface in the five Agricultural Monitoring Catchments.

In this very shallow oxic groundwater, nitrate concentrations are lower than in the root zone water, indicating that nitrate reduction and denitrification take place in the uppermost layer of the soils especially on the loamy soils. The yearly average nitrate concentrations in the upper groundwater in the sandy and loamy agricultural monitoring catchments have also been presented in the Nitrates committee on the 2nd of October 2015 (presentation of Gitte Blicher-Mathiesen, slide #8).

References:

Blicher-Mathiesen, G., Rasmussen, A., Andersen, H.E., Timmermann, A., Jensen, P.G., Wienke, J., Hansen, B. & Thorling, L. 2015. Landovervågningsoplände 2013. NOVANA. Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi, 158 s. – Videnskabelig rapport fra DCE - Nationalt Center for Miljø og Energi nr. 120 <http://dce2.au.dk/pub/SR120.pdf>

Hansen, B., Thorling, L., Dalgaard, T. & Erlandsen, M., 2011: Trend reversal of nitrate in Danish groundwater – a reflection of agricultural practices and nitrogen surpluses since 1950. *Environmental Science and Technology* 45, 228-234.

Hansen, B., Dalgaard, T., Thorling, L., Sørensen, B. & Erlandsen, M., 2012. Regional analysis of groundwater nitrate concentrations and trends in Denmark in regard to agricultural influence. *Biogeosciences* 9, 5321-5346.

Til: Annette Schneider Nielsen (anschn@um.dk)
Cc: Christian Vind (chvin@mfvn.dk), Line Andersen (land@mfvn.dk)
Fra: Jakob Riiskjær Nygård (jam@mfvn.dk)
Titel: Materiale til mødet på fredag
Sendt: 01-02-2016 13:40:10

Bilag: Bilag 1 Note on the Danish NHP 2016.docx; Bilag 2 - Note on groundwater protection when lifting the reduced general fertilization standards fo.docx; Bilag 3 Follow-up note on expected N-reduction from RDP funds to collective N-reducing measures.docx; Bilag 1 Note on model for intermediate compulsory measures dep MST NST N....docx; Bilag 2 New regulation in Denmark in three steps 101215 naer nst-3.docx; Bilag 1 note on consequences of adjusting harmony rules.docx.pdf; Bilag 2 - Follow-up note adjustment of prohibition on soil tillage.doc.pdf; Bilag 3 - Follow-up note concerning N and P effect of statutory buffer strips.docx.pdf; Bilag 4 - Follow-up note targeted nitrogen regulation.docx.pdf; Bilag 1 Note on model for intermediate compulsory measures dep MST NST N....docx; Bilag 2 New regulation in Denmark in three steps 101215 naer nst-3.docx;

Kære Annette

Anders Mikkelsen har bedt om, at Kommissionen får overleveret en pakke med de dokumenter, vi hidtil har oversendt samt centrale bagvedliggende rapporter, forud for mødet på fredag

Jeg har forsøgt at samle materialet her (vedhæftet) samt links til diverse rapporter nedenfor.

Kan du sørge for at overlevere hard-copies af materialet til mødedeltagerne forud for mødet på fredag?

'The baseline report' is a technical report authored by the University of Aarhus. The report estimates the expected change in nitrogen load in the period 2013-2021 based on a 'frozen policy scenario'. In accordance with the planned changes to regulation, the University of Aarhus has published a revision of the original report.

The target load in the Danish coastal water bodies is a result of statistical and mechanistic modelling done by the University of Aarhus and DHI. The models are described in three reports: Part.I – summary, Part.II – mechanistic models, and Part.III – statistical models. A set of minor revisions have been made to the original models, which are expected to be published during the spring.

Bedste hilsener,
Jakob

Med venlig hilsen

Jakob Riiskjær Nygård
Fuldmægtig | Landbrug & Miljø
+45 20 65 06 77 | jam@mfvn.dk

Miljø- og Fødevarerministeriet
Departementet | Slotsholmsgade 12, 1216 København K | Tlf. +45 33 92 33 01 | fvm@mfvn.dk | www.mfvn.dk



**Ministry of Environment
and Food of Denmark**
Environmental
Protection Agency

Danish EPA, Industry and
Agriculture
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18 January 2016

Revision of the Danish Nitrate Action Programme, 2016

EU Member States must, in accordance with the Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC) (hereafter referred to as the Nitrates Directive), prepare a nitrates action programme in order to achieve the objectives of the directive to reduce water pollution caused by nitrates from agricultural sources and to prevent further pollution thereof. At least every four years, the Member States must in accordance with the Nitrates Directive review and if necessary revise their action programme, including any additional measures taken pursuant to paragraph 5.

In this note, an outline is presented of the expected contents of the Danish Nitrates Action Programme as of 1 August 2016 and onwards as well as a short description of the specific changes made in the Danish Nitrates Action Programme following a revision of the programme.

1. The political agreement on a Food and Agricultural package

On 22 December 2015, the Danish government and supporting political parties in the Danish Parliament reached an agreement on a Food and Agricultural package. The agreement includes a diverse package of measures to make a shift in the way environmental regulation of the agricultural sector is carried out, from a general regulation to a targeted approach. The aim is to improve the ability of the food and agricultural industry to increase primary production and exports, as well as to contribute to creating growth and jobs in the entire country of Denmark – in due interaction with the protection of nature and the environment. A central element in the agreement is to lift the reduction of nitrogen application standards for farming, which are reduced by approximately 20% compared to the economic optimal level today. The removal of the reduction of the nitrogen application standards is scheduled to take place stepwise by two thirds in spring 2016 during the current crop season 2015/16 and by the remaining one third in the following crop season 2016/17. As the nitrogen application standards are an element in the implementation of the Nitrates Directive, this change in regulation presupposes a revision of the Danish Nitrates Action Programme.

2. The current Danish Nitrates Action Programme

According to the Nitrates Directive, Member States shall be exempt from the obligation to identify specific vulnerable zones, if they establish and apply action programmes referred to in art. 5 in the directive, in accordance with this Directive throughout their entire national territory. Denmark has established and applied action programmes for the whole territory.

The implementation of the Nitrates Directive consists of the following measures for the whole territory, with reference to art. 5, 4 in the directive:

- the measures in Annex III and
- those measures, which we have prescribed in the code of good agricultural practice, except those which have been superseded by the measures of Annex III.

Denmark has implemented the Nitrates Directive mainly via following current orders and acts:

1. Order on commercial livestock, livestock manure, silage, etc. no. 1318 (26/11/15)
2. Act on farms' use of fertilizer and plant cover no. 500 (12/05/13) and subsequent changes

3. Order on farms' use of fertilizer in the planning period 2015/2016 no. 929 (29/07/15)
4. Order on plant cover and cultivation-related measures no. 1777 (16/12/15)

In general, Denmark is aiming to ensure a comprehensive Nitrates Action Programme, covering the relevant elements. The Nitrates Action Programme has an emphasis on efficient measures and high standards for registration of information, control and monitoring systems.

3. Preliminary revisions of the Nitrates Action Programme in 2016[-2020]

Denmark will be revising the Nitrates Action Programme in 2016. The main elements being revised as of 1 August 2016 are expected to be as follows:

- *Lifting of the reduced nitrogen application standards (Annex III, 1,3)*

In accordance with the political agreement on the food and agricultural package (see above), the lifting of the reduction of the nitrogen application standards is scheduled to take place stepwise by two thirds in spring 2016 during the current crop season 2015/16 and by the remaining one third in the following crop season 2016/17.

In order to avoid an increase in nitrate leaching, compensatory measures will be established, consisting of the following:

- Changes in regulation of establishment of mandatory catch crops and use of other areas as alternatives to the catch crops
- Additional establishment of mini-wetlands, wetlands
- Afforestation
- Targeted catch crop scheme

These measures are not to be considered as elements, directly implementing the Nitrates Directive but they will ensure the necessary reduction of nitrate leaching in accordance with the directive.

- *Removal of the requirement for overflow alarms on certain storage vessels*

The regulation regarding requirement for alarms on certain storage vessels is removed from the Nitrates Action Programme, but will continue to be maintained as an obligatory requirement for the farmers. The regulation will therefore be upheld at national scale but will no longer be covered by cross compliance cf. REG (EU) 1306/2013. The reason for this change is that the specific requirement has been regarded as disproportional in relation to the potential size of sanctions on direct payment that an infringement may result in.

- *Further changes in the Order on commercial livestock, livestock manure, silage, etc. 1318 (26/11/15)*

These changes may concern measures implementing the Nitrates Directive, but are expected to be of minor environmental impact.

4. Subsequent revisions of the Nitrates Action Programme on a longer term

Due to the elements of the political agreement on the Food and Agricultural package as mentioned above, further changes of the regulation of nitrates from agriculture are expected within the period 2016-2020. These changes are not part of the current revision of the Nitrates Action Programme and will be part of subsequent revisions.

2017

Harmony rules and altered phosphorus regulation

Coming into effect from 2017, the Danish government wishes to align the "harmony rules" for slaughter pigs, to ensure that the requirement is aligned with the requirement of the Nitrates Directive that specifies the amount of livestock manure per hectare to 170 kg N, corresponding to 1.7 LU/ha. This means that the harmony rules limit for holdings producing slaughter pigs will be lifted from 1.4 LU/ha to 1.7 LU/ha.

Due to this alignment of the harmony rules, a new regulation addressing phosphorous will be introduced.

The current limit at 1.4 LU/ha also implies for fur animals and poultry, since the manure from these animal types contain a relatively large amount of phosphorus. However, if a new regulation of phosphorus can handle this challenge, the harmony rules for these types of animals may also be aligned.

New and more emission based regulation of livestock holdings

A new regulation of livestock holdings will entail flexibility for the farmer based on the maximum production area in the stables. For the benefit of simplification of the procedure for both farmers and municipalities, the current environmental approval for livestock holdings will only cover the housing system, storage facility etc., whereas the spreading of manure from the holding will be regulated by general rules and registrations in the fertilizer accounts.

The regulation of livestock holdings is expected to be introduced in 2017, at the same time as changing the harmony rules (see above).

A new regulation of livestock holdings will ensure the sufficient and correct implementation of the EU directives. The regulation will be based on the actual emissions from each holding.

2018

Targeted regulation of nitrogen

The future targeted regulation of nitrogen is expected to be implemented from 2018 and onwards. The regulation will be mandatory for all farmers. The regulation will be based on four main principles:

1. The leaching permit/limit in each coastal water body is differentiated geographically in order to meet the nitrogen target in each coastal water body (in total 90 coastal water bodies in Denmark).
2. Each farm is appointed a leaching permit/limit to the water environment.
3. Each farmer is given flexibility in the choice of instruments (e.g. catch crops, buffer strips, reduced nitrogen application etc.) in order to comply with the leaching permit.
4. The farmers will be compensated for the costs involved with the compliance of the reduced leaching permit.

The scheme will be targeted to areas with specific needs to reduce nitrogen leaching to the aquatic environment including ground water.

5. Implementation of Nitrates Directive by mandatory measures in the Nitrates Action Programme

The core of the Danish Nitrates Action Programme will be maintained by ensuring that all key measures corresponding to the specific requirements in the directive are in place, as shown in table 1. The measures are described below in general terms with reference pursuant to each specific litra in Annex II and III of the Nitrates Directive respectively.

Table 1. Overview DK Nitrates Action Programme 1 August 2016 onwards. National measures described in general terms with reference to litra in Annex II and III of the Nitrates Directive.

Nitrates Directive	National measures	
91/676/EEC	Order on commercial livestock, livestock manure, silage, etc. (OO) (Act on environmental approval etc. of livestock holdings/Act on environment/Act on Farms use of fertilizer and plant cover)	Order on plant cover and cultivation (OP) Order on the agricultural use of fertilizer (OF) (Act on Farms use of fertilizer and plant cover)
Annex II, A, 1)	In the period from harvest, though no later than 1 October, to 1 February, liquid manure or digestate from vegetable biomass may not be applied – with exemptions.	
Annex II, A, 2)	Manure, degassed plant biomass, and mineral fertilizer must not be applied on sloping areas.	
Annex II, A, 3)	Manure, digestate from plant biomass, silage effluent, residual water and mineral fertilizer	

Nitrates Directive	National measures	
	must not be applied in a manner with risk of run-off, including water-saturated, flooded, frozen or snow-covered soil.	
Annex II, A, 4)	Manure, digestate from plant biomass, silage effluent, residual water and mineral fertilizer must not be applied 2 m from water courses.	
Annex II, A, 5)	<p>Stables, stalls, etc. shall be designed in such a way that groundwater and surface water is not polluted.</p> <p>Capacity of storage facilities for manure must be adequate (specified). Adequate storage capacity may be satisfied by storage on other property or delivery to the biogas plant, manure treatment plant or manure storage facility.</p> <p>Solid manure must be stored in accordance with the correct provisions. When storing manure it must be ensured that surface water from the surrounding areas cannot seep into the manure storage. Compost with a dry matter content of at least 30% may be stored in the field if complying with certain requirements. Manure stored in the field, deep litter and processed manure, compost with a dry matter percentage greater than or equal to 12 must be covered with waterproof material.</p> <p>Silage must be stored in a silage storage facility or wrapped in waterproof material. Silage effluent must be discharged through purpose-designed drainage.</p> <p>Storage vessels for liquid manure, silage effluent, digestate from vegetable biomass and residual water must be constructed of materials which are resistant, impermeable to moisture. The vessels must be dimensioned in relation to capacity, so that they can withstand the influence, including from stirring, covering and emptying. Storage vessels for liquid manure, which is located in a risk area and close to water must be equipped with tamper-resistant barrier. Drains from stables/stalls, manure yards, silage stocks, cesspools, and pump wells shall be run through impermeable closed pipes and shall lead to liquid manure containers.</p>	
Annex II, A, 6)	Application of liquid manure and degassed plant biomass may only be carried out by means of trailing hoses, trailing foot/shoe applicators or by injection.	
Annex II, B, 7)		Rules on field and fertilizer planning
Annex II, B, 8)		<p>General requirement for 240,000 ha mandatory catch crops is maintained.</p> <p>(In the comments to the draft Act amending the Act on agricultural use of fertilizers and plant cover (the later Act no. 576 of 4 May 2015) is stated: "Plant cover, including catch crops, is particularly suited to take up nitrogen that would otherwise leach into the water environment. As part of the measures to achieve the objectives of the Nitrates Directive is therefore established requirements that agricultural enterprises with crop or livestock or combinations thereof, which have an annual taxable turnover exceeding 50,000 DKR from crops or livestock, or combinations thereof, and has a total area of 10 hectares or more in accordance with § 3 of the Act, shall establish 240,000 hectares of crops nationwide.")</p>
Annex II, B, 9)		Preparation of fertilizer accounts
Annex II, B, 10)		Need for irrigation is included when calculating nitrogen fertilizer standards
Annex III, 1.1	See Annex II, A, 1) and 5)	
Annex III, 1.2	See Annex II, A, 5)	
Annex III, 1.3	The nutrients in manure, digestate from	The yearly amount of nitrogen permitted at farm level is

Nitrates Directive	National measures	
	<p>vegetable biomass, silage effluent and residual water may only be applied to crops with a nitrogen standard or a normative standard for phosphorus and potassium.</p>	<p>calculated taking into account the characteristics of the area and is based on a balance between the foreseeable nitrogen requirement of the crops and the nitrogen supply to the crops from the soil and from fertilization. The optimal relationship between the nitrogen requirements of the crops and nitrogen supply is set every year on basis of trials. This is done for four different soil types and for irrigated sandy soil. In addition, the relationship between prices for nitrogen and crops is taken into account, and the optimal fertilization level is calculated. Farmers are allowed to fertilize according to an optimal level, i.e. up to the economically optimal nitrogen quotas.</p> <p>Due to the varying abilities to retain nutrients, different soil types are divided into four categories with different nitrogen standards for the same crop. Irrigation is taken into consideration by the authorities when the specific standard is set and is only possible on sandy soil. In general the standard is increased when irrigation is possible.</p> <p>To irrigate the farmer needs a permission, which is given by the municipality. At the inspection, the permission to irrigate is checked. Irrigation is seldom used in Denmark, though. On the basis of the composition and distribution of crops and the soil and crop-specific nitrogen standards (in total about 276 different standards), the nitrogen quota for each farm is calculated</p> <p>The nitrogen supply to the crops from the soil is taken into account in several ways (annex III.1.3.c (ii)). Different amounts of nitrogen residues remain after the harvest of a crop. This is taken into account, when the standard of the following crop is stipulated. The individual standards are differentiated with regard to the residual effect of the pre-crop, which has to be withdrawn from the crop's standard the following year.</p> <p>Under the principle of having a balance between the uptake of nitrogen of the plants and the nitrogen supply the farm nitrogen quota is adjusted every year according to the actual amount of plant available nitrogen in the soil (annex III.1.3.b and annex III.1.3.c (ii)), called "the nitrogen prognosis". Due to yearly variations in temperature and extent of rainfalls in the wintertime, there are differences in the prognosis for nitrogen from one year to another.</p>
<p>Annex III, 2, 2a, 2b.</p>	<p>The total quantity of manure and degassed plant biomass applied on an agricultural holding shall not exceed an amount corresponding to 1.4 livestock units per hectare per planning period. Manure produced on agricultural holdings with cattle, sheep, or goats may be applied in quantities corresponding to 1.7 livestock units per hectare per planning period. On agricultural holdings where at least 2/3 of the livestock are cattle, manure and degassed plant biomass may be applied in quantities corresponding to 2.3 livestock units per hectare per planning period when in compliance with certain conditions. A maximum of 170 kg N per hectare per planning period of manure and degassed plant biomass may be applied on agricultural holdings. The quantities of manure applied to land as well as area for spreading manure (harmony area) are calculated on the basis of further specified methods. If an agricultural holding has greater quantities of manure available, including manure received from other farms, than what can be applied to</p>	

Nitrates Directive	National measures	
	spreading area, agreements shall ensure that excess manure is disposed to/for by specified solutions. The operator must be able to document compliance with the harmony rules.	