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Dear Giles

NFU Response to EA/ NE consultation on Poole Harbour Consent Order

The NFU is pleased to be given the opportunity to comment on the Poole Harbour Consent Order on behalf of its' members and the wider agricultural community. The NFU represents 55,000 members in England and Wales, involved in 46,000 farming businesses. The NFU is a professional body, which represents the interests of approximately 75% of all farmers and growers. It has approximately 3000 members across the Wessex area and over 1000 across Dorset. The NFU has consulted with its members in Dorset and also with regional and national experts. The views within this response represent our members concerns about how proposals may impact farming and the land management sector.

Farmers within the catchment recognise that reductions on nitrate and phosphorus pollution into the harbour are necessary to achieve favourable status for Poole Harbour, However, recommendations that impact farm business must be based on robust data and evidence as well as aspiring to deliver for sustainable food production and the environment. In order to do this, better use of existing tools and exploring the use of new mechanisms should be encouraged.

The analysis we have presented below shows errors and uncertainty within the current data and modelling. It is evident that nutrient pollution within the catchment needs to be minimised however if the errors are rectified as suggested within our response, more restrictive regulatory measures such as Water Protection Zones (WPZ's) may prove to be disproportionate. The best route to success will be through enhanced and coordinated delivery across farming and all other related sectors.

1. Background

Farming now accounts for approximately 5% of Dorset's economy with the annual gross output equating to £306 million and the GVA reaching £112 million. 548 farms occupy 75% of the land within the catchments and is made up of cereals and general cropping (153), dairy (46), lowland grazing (274), mixed cropping and livestock (44).

The NFU has always, and remains, committed to working in partnership with all those with an interest and stake in the future of the environment, farming, communities and farming across Dorset. We have been actively involved in developing the various plans

relating to Poole Harbour. In 2009, the NFU jointly authored and signed a statement on behalf of its' members, and the wider farming community, to reducing nitrate leaching by all reasonable measures and to maintain the direction of travel that had been created by their existing engagement and action. The NFU actively promotes schemes and initiatives to the farming community that deliver for the environment. Some of these include Tried and Tested, EnTrade, Campaign for the Farmed Environment and Catchment Sensitive Farming. Schemes such as these promote measures that will help to achieve the desired outcome for Poole Harbour and are already trusted and engaged with farmers.

In 2017 the NFU wrote to all of its members across Wessex urging them to adopt reasonable measures. The strong direction of travel means there is growing ownership of the issues and action to reduce nitrate leakage.

In his vision of delivering a green Brexit, Secretary of State Michael Gove noted that “... *in this unfrozen moment new possibilities occur*”. For agriculture there is tremendous uncertainty regarding the future of trade, support schemes and government policy. However, there is a great opportunity to look a new at how the environment is delivered and to push for new mechanisms.

2. Summary of the response

- There must be a focus on approaches that allow flexibility and allow for effective and efficient delivery of nutrient reductions to deliver favourable status in Poole Harbour.
- Any reductions in the baseline of nutrient leaching from agriculture must be incremental, phased and achievable
- There are concerns with the data for assessment of macroalgae mat coverage as this is out of date.
- There is significant uncertainty with the estimates of current and future N loads to Poole Harbour from diffuse sources
- The distribution of algal mats within Poole Harbour and nutrient modelling suggest that there is a significant seasonal and STW influence which must be researched in much greater detail to allow appropriate and most effective mitigation measures to be designed
- WFD classification is marginal and strongly influenced by STW discharges in to Holes Bay
- The recommendation to tackle summer N in preference to winter loadings in order to have greatest influence on algal growth appears to have been largely ignored.
- The blanket approach to agricultural diffuse N and P loading, farmers in the less affected catchments would be penalised for higher N loads occurring elsewhere in the Harbour.
- There are other mechanisms available, such as a nutrient exchange, that will deliver the required nutrient reductions.
- There is a need to have a holistic approach, which uses all mechanisms and measures available.
- There will be significant cost to agriculture as a result of the scenarios, which will result in severe hardship and stress to farming families and businesses.

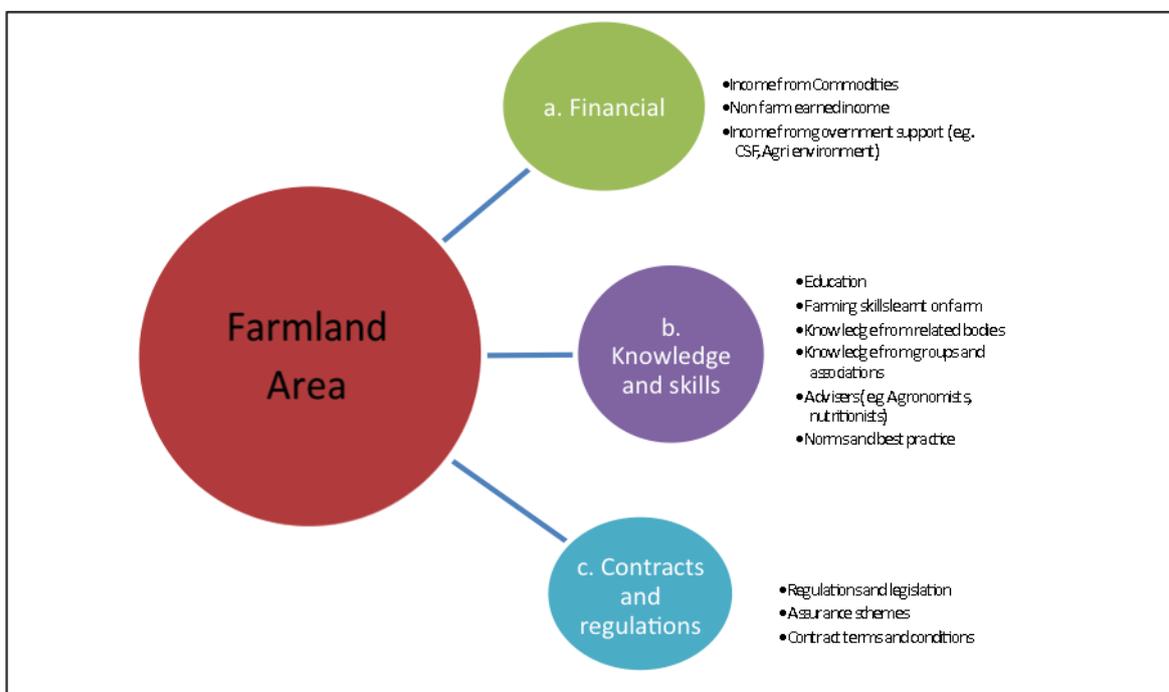
3. Cost benefit of management and land use change to agriculture

The impact of the scenarios will necessarily have a cost to agriculture as a whole and farming enterprises individually. The cost will vary according to farm type, existing infrastructure, location and ability to change. We estimate that the costs to agriculture within the Frome and Piddle catchments could range from at least £750k to £1.5m per annum based on using a limited set of measures and using the figures for Countryside Stewardship and prices from EnTrade reverse auctions. We note that these prices are income foregone and also do not include the value of fixed costs to a farming enterprise.

The cost of bringing in regulations to change farming practice will not only result in financial hardship but also considerable stress. It is essential that a full cost benefit analysis is carried out and developed and shared with stakeholders. In addition to the costs to the industry any regulation will have high costs in terms of monitoring, enforcement and communication. This can be avoided by taking a better regulation approach and using market tools and working with the agricultural community to deliver change.

4. Nutrients and their importance to agriculture

Nutrients are a key resource that underpins the viability and profitability of the farming industry, and their use is a key concern for all farmers. The farming industry is actively engaged in managing nutrients across a vast range of different mechanisms. An overview of the key mechanisms that enable farmers to act in a certain way is shown in the diagram below:



a. Financial

There are a large number of financial mechanisms both through the market and also through government incentives. The main mechanism has been through agri-environment schemes and in particular the excellent work of the Catchment Sensitive

Farming Scheme (CSF). Both of these, and in particular CSF, have underpinned direct measures being deployed such as cover crops, reduced or zero fertiliser use on grassland and conversion of arable land to grassland. In addition skills and knowledge training through events and one to one advice have been critical in building ownership, understanding and delivery of activity.

Wessex Water catchment team have engaged with farmers to promote a better understanding of the nutrient value of various on-farm measures. This has been done through one to one advice and financial support for measured delivery. The success of this approach is demonstrated by the EnTrade model where farmers have offset 50tonnes of nitrates from Wessex Water through the use of cover crops delivered via a reverse auction trading system.

b. Contracts and regulations –

There are a vast array of both private contracts and statutory regulations that control and enforce the use of nutrients and protect the environment and wildlife. Within the regulatory sphere these include, *inter alia*: Silage, Slurry and Agricultural Fuels Order 1991 (SSAFO); Habitats and Birds Directive; Nitrates Directive 1991; Environmental Permitting Regulations 2010; Water Resources Act 1991 and the Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018. It is essential that before any new regulatory tools are used that the existing tools are enforced and effectively targeted and implemented.

In addition to the regulatory tools there are a number of industry led contracts and assurance schemes. These include: Red Tractor Farm Assurance (over 80% of all dairy farms are signed up to this); voluntary schemes such as LEAF, Tried and Tested, the Voluntary Initiative and the Campaign for the Farmed Environment. Many processors and supermarkets operate their own schemes and have conditions on the use of nutrients. For example, Tesco require all their suppliers to meet Red Tractor standards including having manure management plans which control the use of manures and meeting crop requirements.

c. Knowledge and skills

Knowledge and skills underpin all farming activities. The growth in understanding of diffuse pollution from agriculture has been a success for the Wessex area over the past years. Farmer focused events led by CSF and Wessex Water have helped to spread awareness and take up of measures.

More regular and accurate updates on nutrient use across different farms linked to their impact on the environment and also farm profitability would bring about substantial change through understanding.

5. Scientific analysis of Draft Consent Order Technical Document for Poole Harbour.

There are five main areas for comment in relation to the proposed revised Nutrient Management Plan (NMP) prepared for the Poole Harbour catchment;

- a. Data for assessment of macroalgae mat coverage is out of data
- b. Source apportionment
- c. Distribution of algal mats within Poole Harbour and nutrient modelling

- d. WFD status
- e. Mitigation modelling

These are discussed in more detail below.

a. Data for assessment of macroalgae mat coverage is out of date

The context of the existing and updated NMP is detailed within the Option Appraisal Template which states:

“The extent of macroalgal mats in Poole Harbour has increased since the 1980s from a minimum of nearly 100 ha to around 400 ha in recent years. Mats covering over 75% of the substrate increased from 41 ha to over 200 ha, a change from 3% to around 15% of the intertidal mudflat area. In recent years about 6% of the total mudflat area was recorded to support macroalgal mats with a biomass of 2 kg/m²”.

However, we believe this assessment is out of date. The last full survey undertaken (2011) indicated that 12% of the available intertidal habitat (AIH) had 25% algal cover and only 0.3% with a mean biomass of >2 kg/m²⁽¹⁾. The last survey (2015) indicated 0% of the AIH had a mean biomass of >2 kg/m². The overall coverage at >25% and 75% has consistently decreased since 2008, although it is accepted that this could be influenced by reduced coverage of the surveys:

Table 1: Percentage cover of available intertidal habitat		
	Macroalgae coverage	
	>25%	75%
2008	30%	11%
2009	33%	15%
2011	12%	11%
2015*	9%	8%
* partial survey		

As detailed within Poole Harbour Catchment – Strategy for Managing Nitrogen (NMP) – summary (p2); an update of background data has been undertaken. Specifically:

- Updating condition of Poole Harbour SSSI/SPA/RAMSAR intertidal unit (2017) and
- Assessment of opportunistic macroalgal abundance at Poole Harbour

The Habitats Directive advises that an appropriate assessment should be undertaken if the percentage cover of macroalgae is greater than 15% or if the % cover is >5% and the density is >1000 g/m². This criteria was met in 2008, 2009 and 2011 but not 2015 (NVZ datasheet).

In 2017 the status of the WFD Protected Area and SSSI condition was re-assessed in light of a recommended reduced biomass density threshold (from >2 kg/m² to >0.5

¹ Poole Harbour NVZ datasheet, DEFRA, 2016

kg/m²). This assessment was undertaken on data from 2008 and 2009 only (to date, the online condition of units SSSI has not been updated with this information).

It is reiterated that a significant reduction in the macroalgal mat cover has been consistently observed since 2008, in particular in Holes Bay which we presume is associated with improvement to Poole STW in 2008, which included N stripping.

Inclusion of data from 2008 and 2009 only in the re-assessment does not reflect the current condition, or take into account the significant reduction in STW discharges to Holes Bay and the Outer Harbour, and improvements in farming practices. With consideration of the potential financial implications of the proposals and the improvement in water quality within the Harbour and Holes Bay since Poole STW introduced Nitrogen removal, we consider it essential to have an up-to-date survey of the macroalgae coverage and density on which to base modelling and decision making.

In summary, we do not consider use of 2008 and 2009 macroalgal data in the recent re-assessment of Poole Harbour status represents the 'current' condition of the Harbour. In addition, the last full survey was undertaken in 2011, nearly 7 years ago. This, again, cannot be considered representative of current conditions. Data used in the assessment of macroalgae mat coverage is insufficient and not reflective of current situation.

b. Source apportionment

The assessment undertaken by Natural England², including the ADAS Farmscoper model results, indicates the current (2013-2017) agricultural loss of N at 1,475 t/yr (Figure 4.1), later revised to 1,887 t/yr (2018) (Figure 7.1) using 2015 land use. The total landward and direct input to Poole Harbour for 2013 – 2017 was estimated at 2,316 t/yr (Figure 3.1). However, these values do not include contribution from tidal exchange which is estimated at 500 t/yr equivalent to 18% of the total load.

The report suggests that, using 2015 land use data, atmospheric deposition from agriculture amounts to 1,100 t/yr ammonia and 450 t/yr nitrous oxide.

The data in Figure 3.1 apparently uses the mean flow (Figure 2.1) and mean (5-year average) concentration (Section 2). However, if we calculate the N loads from this data for the Rivers Piddle and Frome the combined N load is estimated at 1,713 t/N/yr. If this represents current conditions, the values provided in Figure 3.1 to give a combined load from the Piddle and Frome (1,908 t/N/yr) would appear to be an error.

The reported increased N load from the two rivers between 2006-10 and 2013-17 occurs despite a reduction in inorganic nitrogen from agriculture of 190-240 t/yr (Section 3). It is surmised that the reduction in agricultural N is not apparent in surface water quality due to historical nitrate entering rivers via groundwater. Contribution from groundwater is not considered in this report in detail. However, according to a recent paper by Wang et al (2016)³, the nitrate concentration in the South Chalk aquifer peaked in 2014, and is now decreasing. Due to transit times within the chalk, the

² Background information for understanding the catchment situation on nitrogen nutrient enrichment in Poole Harbour Natura, 2000 site. Kite and Nicholson, Natural England (not dated)

³ The Changing trend in nitrate concentrations in major aquifers due to historical nitrate loading from agricultural land across England and Wales from 1925-2150. Wang L, Stuart ME, Lewis MA, Ward RS, Irvin DSK, Naden PS, Collins AL and Ascott, MJ. 2016

reduced agricultural inputs will take 30 to 35 years from the time of improvement to be identified in rivers.

The indicated increase in N contribution from the Rivers Frome and Piddle (2006-10 and 2013-17), which would appear to be dominated by N from groundwater baseflow, is in-line with the findings of Wang et al³, who stated that peak concentrations in the chalk in Southern England occurred 2014. Therefore agricultural contribution will only reduce from this time.

The results of ADAS modelling reported in the Options Appraisal Template contradict the findings of Wang et al by suggesting load will increase to “about 2,400 tonnes in the 2030’s ...” This again highlights uncertainties in the existing and future predicted N loads to Poole Harbour from non-point source contributions. Contributions from nutrient cycling from sediment within Poole Harbour have also not been considered in detail.

The current groundwater contribution to the Rivers Piddle and Frome has a mean concentration of 8.41 mg/l and 9.94 mg/l (based on mean groundwater quality data of boreholes within the catchment). The reported current river concentrations are 5.6 mg/l and 7.1 mg/l for the Frome and Piddle respectively. As the BFI of these rivers is 85-89%, this suggests notable dilution of the historical groundwater concentrations is occurring as a result of current surface water run-off.

In summary we believe significant uncertainty still exists with estimates of current and future N loads to Poole Harbour from diffuse sources. We recommend assessment of the impact of declining groundwater N concentrations on the future predicted N loads and that chemical testing of the silt is undertaken and nutrient recycling is considered in the overall source apportionment. Subsequent mitigation measures to tackle this source could then be designed.

c. Distribution of algal mats within Poole Harbour, nutrient modelling and seasonality

The WFD status of specific areas within Poole Harbour is provided below using the same geographic assessment units as the macroalgal mat model (AMP 2 and 3):

Table 2: WFD status of areas within Poole Harbour	
Mat modelling area	WFD status
Wareham Channel	Good
Holes Bay	Moderate/Poor
Outer Harbour	Moderate

Assessment of mean biomass and affected areas indicates that Holes Bay is the worst affected area within the Harbour. This area is considered a hydrologically distinct unit to the rest of the harbour. The entrance to the harbour is narrow and as a result has a very low flushing rate. It is considered that discharges from Poole STW dominate the water quality in this bay. This is supported by the macroalgae modelling⁴ which states, “... Poole STW has a large influence on growth in Holes Bay and the Outer Harbour.

⁴ Water quality and macroalgae modelling of Poole Harbour: Estimated the required reductions in nutrients to achieve acceptable densities of macroalgae. James A, Edwards K and Bryan G (not dated)

The results suggested that without addressing this discharge, meeting targets in Holes Bay would not be achieved”.

The above quote also highlights that the discharge from Poole STW influences the Outer Harbour. Based on the hydraulically isolated nature of Holes Bay, it is considered that Holes Bay should be considered separately to the rest of Poole Harbour when determining SSSI/WFD status due to the differing influences and the reduced hydraulic connection. The proposed significant changes to the agricultural N management within the whole Poole Harbour catchment can have negligible influence or impact on the condition of Holes Bay. This area is disproportionately influenced by Poole STW and diffuse measures to improve the SSSI status/WFD status should not be applied as they cannot influence the outcome.

It is also noted that Lytchett Bay is hydraulically distinct from the majority of the harbour and is strongly influenced by water quality in the River Sherford and discharges from Lytchett Minster STW. Similar issues to those in Holes Bay are therefore likely to prevail here.

Calibration of modelling of macroalgae growth within the Wareham Channel, which includes inputs from the Rivers Piddle, Frome and Sherford, as well as direct discharges from Lytchett STW, proved very difficult. The model predicted higher algal growth than observed based on available nutrients. It was concluded that factors not included in the model, such as wet area available for growth, light penetration, sedimentation salinity and manual weed clearing, may have greater influence than thought. The model results for Wareham Channel were, therefore, viewed less confidently than other areas of Poole Harbour. Despite this the model continued to be included in the assessment of potential mitigation measures.

Annual load source apportionment of N using mean or average values is used to attempt to relate nutrient loads to algal mat growth. This approach is considered too simplistic. It fails to acknowledge the strong seasonal influence of nutrients and algal mat growth. It does not consider the concentration of nutrients during the growing season, or the higher concentration of point source discharges in relation to notable mat occurrence and biomass density. As stated, this approach also fails to consider the nutrient storage in mudflats, the timing of release of nutrients and how this issue can be addressed/influenced in the short and long-term.

It was highlighted in the macroalgal modelling report for Poole Harbour⁴, that there is a “[h]igh impact of STW flow – as a result of STW load discharges being consistent through the summer and winter, these discharges had far greater influence on macroalgae growth when compared to the river flows, which are considerably lower in summer months. The result is that a like for like influence will not be observed and targeting summer discharges will result in a greater growth reduction”.

This point appears to have been omitted from the draft ‘Recommendations to deliver favourable status across Poole harbour catchment’ report where a blanket approach to mitigation measures is taken.

In summary, the status of Holes Bay affects the assessment of the whole of Poole Harbour and consideration should be given breaking down Poole Harbour to the

hydraulically distinct area (as used in the modelling). The most notable algal mat coverage is located in Holes Bay, Lychett Bay and Holton Heath area which are all in the immediate vicinity of STW discharges with N and P concentrations significantly above that in the rivers. With this in mind the influence of seasonality must be researched in much greater detail to allow appropriate and most effective mitigation measures to be designed.

d. WFD status

Table 3 below summarises data from the NVZ datasheet for Poole Harbour. Based on the WFD metric system for opportunist macroalgae blooms which puts the mood/moderate boundary at 5-15% cover of AIH, average biomass of affected area of $>0.1-0.5\text{kg/m}^2$ and affected area of $>10-50$ ha, the table below indicates classification is marginal and strongly influenced by STW discharges into Holes Bay.

Table 3: Summary of Poole Harbour macroalgal coverage surveys					
Year survey	Total area (>25% algal coverage) (ha)	% of AIH	% AIH >2 kg/m ²	% AIH >2 kg/m ² excluding Holes Bay (ha)	% AIH >0.5 kg/m ² excluding Holes Bay
July 2008	383.8	30	13.07	8.3	-
July 2009*	420.24	33	5.38	0	-
August 2011	157.3	12	0.34	0	-
September 2015 [^]	117.5	9	0	0	4.82%
* Post-installation of N removal at Poole STW ^ partial survey only 33% of AIH					

We have reassessed the 2015 data in the NVZ data sheet using the new reduced assessment metric of 0.5kg/m^2 . The assessment indicates that, excluding the Holes Bay area, only 4.82% of the AIH in Poole Harbour would fail the new assessment criteria. With Holes Bay this figure increases to 7.9%. Based on this data, only small areas of the harbour are therefore affected by opportunistic macroalgae

e. Mitigation modelling

Agricultural mitigation measures to reduce algal mat coverage appear to take no account of where the worst affected areas occur. The WFD status indicates that Wareham Channel is little affected by algal growth; however the same desired reduction in N load is applied to this surface water catchment area as to other areas of Poole Harbour. The mitigation measures do not appear to be focussed on areas where algal mat growth is at its highest, but are applied in a blanket approach with no consideration of the seasonality of agricultural N loadings.

The recommendation to tackle summer N in preference to winter loadings in order to have greatest influence on algal growth also appears to have been largely ignored. Additionally, the effect of predicted reducing groundwater N loads is not included in the assessment of necessary mitigation measures.

It is accepted that recent improvements in agriculture has probably led to a 100 to 150 t/yr reduction in N loading, with an addition 90 t/yr due to environmental schemes. The effect of this is unlikely to be seen until the masking influence of groundwater inputs have waned. It is therefore not known if the existing changes in agricultural practices would be sufficient to reduce algal mat growth within Poole Harbour in conjunction with planned STW improvements.

It is apparent that significant uncertainty remains over the degree and impact of agricultural diffuse N and P loading on algal mat growth across the whole of Poole Harbour. What is known, however, is that the removal of major influence of Poole STW discharges would have an immediate and significant impact on Holes Bay and the Outer Harbour, which have the highest densities of algal mat coverage.

Due to the blanket approach to agricultural diffuse N and P loading, farmers in the less affected catchments would be penalised for higher N loads occurring elsewhere in the Harbour.

6. Legal issues

a. Demonstrating the legal tests for introducing a Water Protection Zone (WPZ)

In the Poole catchment, there is a long groundwater cycle, and it is acknowledged that a significant proportion of the nutrients entering the harbour are due to historic practices. Farmers in the Poole area have already worked hard and engaged with voluntary schemes to reduce the nutrients leaching from their land, and it is evident that this has had a substantial reduction on the amount of current nitrate leaching. However, nothing can be done about the nutrients in the groundwater due to historic issues; they have to work their way through the system..

A WPZ can only be used where one or both of the following conditions are satisfied:

- *it is appropriate, with a view to preventing or controlling the entry of any poisonous, noxious or polluting matter into controlled waters, to prohibit or restrict the carrying on in that area of activities which the Secretary of State considers are likely to result in the pollution of any such waters.*
- *it is appropriate, with a view to preventing or limiting any harm that is being or is likely to be caused to controlled waters, to regulate the carrying on in that area of activities which the Secretary of State considers are likely to result in such harm.*

Whilst the NFU acknowledges that some nutrient leaching does still occur, it is widely acknowledged that approximately 68% of the nutrients leaching into the harbour are due to historical, rather than current, farming practices. Any measures introduced now will not prevent those historic nutrients entering controlled waters; they can only influence the much smaller modern contribution to the nutrients entering controlled waters. Consequently, the NFU believes that it is questionable whether either of the above tests can be satisfied due to the very limited impact that further restrictions on current land management practices can have.

Due to the significance of the historic contributions to nitrates in the groundwater, the NFU believes that further time should be allowed for the benefits of the recent work undertaken to feed through, in order that the current nutrient contributions can be more accurately assessed.

b. The appropriateness of a WPZ

The Catchments feeding into Poole Harbour cover an area of circa c.800km², with a diverse farming sector as noted in the background notes at the beginning of this response. The NFU has concerns about the practicality designing and adopting a WPZ covering such a large area.

As highlighted in the Draft Report, there are a diverse range of farming businesses within the catchment, who operate in very different ways, with different risks attached to each. It would not be fair to impose the same restrictions on all farmers, without taking into account the risks posed by that type of farming enterprise, the practicality of implementing those measures or considering what that farm has already done to minimise its nutrient leaching.

The NFU urge the Environment Agency to consider whether any WPZ should, at least in the first instance, be more focused, taking account of the predominant land uses in different areas and the risks that these different activities pose. Alternatively, the NFU urges the Environment Agency to consider how safeguards can be built into the WPZ so that those farms who are already low risk for nutrient leaching, either because of the nature of their operations or because of steps they have already undertaken, are not subjected to disproportionate restrictions which could threaten the viability of their farming business.

Farming is already a highly regulated sector, with new regulations having been recently introduced with a view to reducing diffuse pollution from agricultural sources, in the form of the Farming Rules for Water. The farming rules for water were also introduced in April this year, placing additional regulatory controls on farmers, and again, there has been insufficient time for these changes to feed through into Poole Harbour. These Regulations contain their own enforcement provisions, and so do not need to be duplicated in a Water Protection Zone. In the NFU's view it would be undesirable and unnecessary to introduce a second offence for failing to comply with a Regulation which already contains its own enforcement mechanism. So, any WPZ which may be introduced should not include compliance with the Farming Rules for Water as one of the requirements, as compliance with those Rules should be enforced through its own bespoke enforcement regime, as would be the case elsewhere in the country.

It is not clear whether the fact that compliance with these new rules is now mandatory, and will remain so in the absence of legislative change, has been taken into account when considering whether a WPZ is appropriate at this point in time, as Scenario 1 is solely based around implementation of these rules. The Report does appear to acknowledge that the improvements envisaged from the implementation of these rules are not dependent on the implementation of a WPZ. If the fact that compliance with these rules is mandatory and should not form part of any WPZ is not recognised in the report, the findings and conclusions of the report need to be revised to accurately reflect the position that all farmers will already have to be compliant with these rules, and that a WPZ is not required to enforce these rules.

c. Measures within a WPZ

In the event that the Environment Agency does decide to implement a WPZ, the NFU is concerned that any measures adopted as part of a WPZ must be proportionate, achievable and verifiable. As mentioned above, the NFU is concerned to ensure that there is not a duplication of existing offences, which would risk farmers facing inconsistent approaches and potentially expose farmers to a double jeopardy situation where the breaching the same regulation could result in two different enforcement approaches being taken.

The NFU is concerned about measures such as maximum leaching targets, as there is no completely objective and verifiable way to measure diffuse Nitrate leaching, making it difficult for farmers to ascertain whether they are compliant with the legislation or not. Modelling is not, in the NFU's view, a sufficiently robust method of assessing compliance as it is difficult to accurately model such complex situations, and different models may produce different outcomes; whilst modelling can play a role in assessing likely impacts of different possible approaches, it cannot provide the certainty that is required for a criminal prosecution, where offences have to be proven "beyond reasonable doubt". In addition, it is important to remember that not all farms have access to high quality broadband connections, so it would not be reasonable to introduce laws that required farmers to make use of online modelling tools which may be out of the reach of some farmers. Where criminal sanctions could result from a failure to comply with Regulation, it is important that all tools required to achieve compliance are readily accessible to all farmers who have to comply.

Any measures within a Water Protection Zone also need to be consistent with, but should not duplicate, other requirements farmers have to comply with, such as the NVZ rules, the farming rules for water and cross-compliance. Consideration should also be given to how it can be ensured that those with existing agri-environment agreements are not disadvantaged by the introduction of any new restrictions (e.g. if the restrictions are incompatible with an agri-environment option, or that this is accounted for in the transitional provisions).

d. Transitional period

In the event that a Water Protection Zone is introduced, there would also need to be a transitional period to allow farming businesses to adjust to the changes. This needs to take account of a range of factors, including allowing businesses time to plan for major changes or expenditure required or to build any new infrastructure that may be required. In addition, there may be practical constraints on the imposition of certain changes, as many agricultural activities can only be undertaken at particular times of the year. Again, this needs to be reflected in the transitional arrangements, to ensure that farmers are able to comply with any requirements that are introduced.

The NFU is also concerned about fairness and consistency across different sectors; it would be unfair and unjust if farmers have to implement expensive and difficult changes within a shorter period than other sectors (e.g. the water sector).

e. Finding the right regulatory tool

The NFU would also question whether a WPZ is the right tool for the farming sector. Farms are extremely diverse, and as a result the potential pollution risks differ between

different farms. The NFU is concerned about whether a WPZ can balance the need for certainty regarding the nature of the restrictions imposed against flexibility to cope with different farm types and different farming systems. Measures which are appropriate on one farm may be impractical or unnecessary on another.

To date, improvements in technology and voluntary schemes have delivered significant reductions in the levels of nitrates, which are likely to be leaching off farmland. Many of these changes will still be working through the groundwater cycle and so will not be seen in the water entering the harbour. The NFU believes that more should be done to explore how these voluntary schemes can be improved or what incentives can be offered to further increase uptake of these schemes, and explore alternative approaches, rather than moving to a regulatory regime across the board.

7. Alternative approaches

The NFU and its members have always sought to engage with the Environment Agency, Natural England and key stakeholders to develop the measures and mechanisms available to farmers.

The Consent Order report from the EA and NE has mainly focused in dealing with current point and non-point sources of nutrients. Whilst it is essential for the long term that measures are implemented to reduce the amount of nutrients entering groundwaters and surface waters from current activities, there must also be work to the impact of the algal mats and also to reduce the amount of nutrients flowing into Poole Harbour through the fluvial system. We believe that an important part of the approach should include “end of pipe” solutions such as algal harvesting and the use of wetlands.

We are pleased to note the use of wetlands within the scenarios, which must be used via voluntary agreement and based on best science. Natural, restored, or constructed wetlands are able protect downstream waterways from the impact of nutrient leakage. They represent a cost effective tool that can be strategically and precisely placed to reduce the excess nutrients coming off farm fields and from STWs. Wetlands are able to remove nitrogen and phosphorus through a combination of physical, chemical, and biological processes. These naturally occurring processes adsorb/absorb, transform, sequester, and remove the nutrients and other chemicals as water slowly flows through the wetland.

Algal harvesting has long been discussed within Poole Harbour and much research and exploration of its potential value has been done. As a short to medium term measure harvesting has the potential to help Poole Harbour SPA achieve favourable status early and also to encourage further action through success and also to enable the growth of the shellfish and tourism industry.

The NFU believes that it is essential that all possible voluntary mechanisms are used before any additional regulations are introduced. Voluntary mechanisms have numerous advantages over any regulatory approach. These include but are not limited to:

- Enabling additional public benefits to be realised
- Enabling innovation
- Enabling locally relevant and effective solutions

- Enabling flexibility to work with science and best available practice
- Enabling new opportunities to develop
- Enabling ownership and engagement with the issues and the solutions

It has already been shown that catchment approaches through CSF, Wessex Water and EnTrade have delivered nutrient reductions. A number of alternative approaches could be used to deliver action on the ground. These include a Poole Harbour Nutrient Management Scheme (described below), expanding EnTrade⁵, greater effort towards voluntary action, a Green Impact Bond⁶, and a Blue Flag⁷ model. The key considerations with all the mechanisms are, *inter alia*: do they deliver sufficient nitrogen reduction?; what confidence is there that they will work?; are they sustainable economically, socially and environmentally?

The vision for PHNMS is that *“The farms⁸ in the Frome and Piddle catchments are the most efficient users of nutrients in the world.”* The aims of PHNMS are to enable farms to grow current farm models whilst allowing Poole Harbour to achieve favourable status for its Special Protection Area.

PHNMS uses a nutrient bank as the hub for a nutrient credits system. Credits are allocated to each sector based on their contribution to nutrients in Poole Harbour and the targets laid out in the Nutrient Management Plan. The credits will be capped and nutrient levels phases to enable the system to develop incrementally. This means farms can adapt ensuring their businesses remain viable and also slowly develop the market value of N.

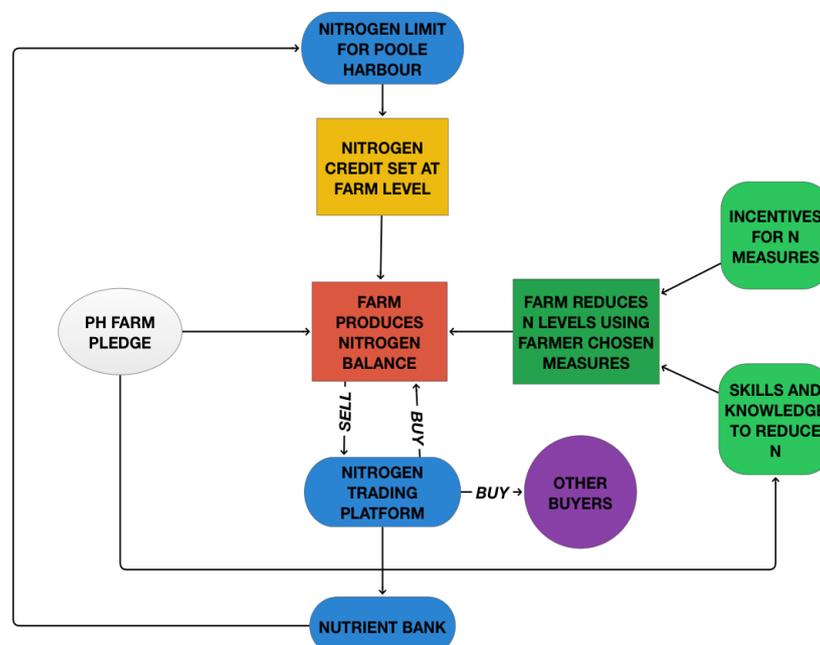
The process is laid out in the diagram below.

⁵ EnTrade is a reverse auction platform operated by Wessex Water and delivering specific measures.

⁶ A “Green Impact Bond” is a market approach to delivering an issue

⁷ A scheme devised by the NFU and the dairy industry in Wales as an alternative to an NVZ.

⁸ Can be changed to “all sectors”



PHNMS will be overseen by the Poole Harbour System Operator Group (PHSOG). The PHSOG will include the key deliverers and regulators. In addition to the PHSOG will be a grouping of all other stakeholders who will be able to add value to the process and ensure progress towards favourable status in Poole Harbour. The PHSOG will be tasked with delivering the vision for the area.

The PHSOG will develop:

- **Nutrient Bank** to oversee and account for all N in the system
- **Nutrient trading** exchange
- Allocation of **N targets** to each sector
- Phased nutrient reduction programme
- Coordinated delivery of nutrient reduction programmes and measures

The PHNMS is underpinned by a nutrient trading exchange. This is independent of all parties and is tradable on a regular basis thus ensuring incentives for buying and selling. At a farm level it works as follows:

1. A N balance is set for agriculture in the catchment.
2. Each farm will be given its N target and use standard software to work out its N balance.
3. Each farm will look at strategies to manage N according to its farm system.
4. Phased approach where the amount of N available is capped

PHNMS is a market based system that creates new opportunities for selling N. Reducing N will have an impact on some farming businesses, but the mechanism is fair and provides incentives for action, minimises costs whilst creating new opportunities. The scheme will also utilise prioritised inspections by EA and existing regulations.

PHNMS has the support of Dorset NFU and the Poole Harbour Farmers Group. Farmers have recognised the need for ensuring that ALL farms engage. This would be achieved by all farms being asked to sign up to the Poole Harbour Farm Pledge. The Pledge would require that a farm hands in their annual nutrient balance, that they sell all surplus credits and that they undertake all necessary training. Farms would all be expected to meet the current regulatory requirements. All farmers consulted so far have recognised that PHNMS represents the best available alternative mechanism to a regulation which would have drastic impact on agriculture. In addition all recognise that there is the opportunity to develop new farming markets through the creation of nutrient credits by adopting nutrient reduction measures beyond the baseline.

8. Conclusion

The NFU, its members and the wider farming community are committed to the better use of nutrients both for the environment and for viable farming businesses. Poole Harbour is an important wildlife area that is part of a wider landscape for which farming is crucial for tourism, wider environmental management, communities, businesses and culture.

As laid out in the response, the NFU has serious concerns regarding the science and data behind the technical report and also the potential to use additional regulatory measures such as WPZ. Over the years the farming community has developed close links and partnerships with the key stakeholders in the area that has already delivered improved nutrient management. Any future action must build on this.

If you require further information or clarification of any of the points raised in the response please do not hesitate to contact me at the South West Regional Office.

Yours sincerely



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