Some Implications of Implementing the EU Water Framework Directive for Developing Agriculture - An EPA View

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The EU WFD & Groundwater Directive

- THE WFD (2000) is an over-arching Directive, which encompasses other Directives, such as the Nitrates Directive
  - The main policy instrument for European water management
- Ecosystems have a ‘legal entitlement’ to adequate water (quality & quantity)
- The EC are likely to enforce the requirements of the WFD where the WFD objectives are not being met
Context: Water Quality in Ireland

- Some polluted water bodies, but situation good relative to most other EU countries

Context: Food Harvest 2020

- A benefit to the economic well being of the country

- A challenge for environmental management, both for water quality and greenhouse gas emissions
Context: Phosphate & Nitrate

- 1 kg Phosphorus when present as phosphate will pollute 29 million litres of water (or 6.4 million gallons) [Would most farmers realise this?]

- A loss of just 30-40 kg N/ha will pollute groundwater from a drinking water perspective

- Therefore, need to give priority to minimising 'leakage' of P & N from soils and farmyards
Challenge – Maintaining existing water quality

- An absolute priority; there must be “no deterioration”

Average phosphate concentrations in EPA national groundwater monitoring network
Challenge - Restoring 'polluted' water bodies


- Need to start now!

- Must not let the "lag time" make us complacent; we will be expected to show improvements.
Challenge: Achieving drinking water limits for Nitrates may not be sufficient

- **Drinking water N standards**
  - Max Admissible Conc. (MAC) = 11.3 mg/l as N
  - Groundwater Threshold Value (mean) = 8.5 mg/l

- **Ecological WFD requirements may be more stringent than drinking water requirements**
  - Coastal waters Env. Quality Standard = 2.6 mg/l at freshwater/salt water interface
  - Rivers EQS = ?????
  - GWDTE Trigger values = ????
  - Research & monitoring required ......
Challenge: Continuing the Nitrates Derogation

- Essential for increased output

- But:
  - Increased nutrient losses must not happen & reductions are needed in places
  - The ‘transitional’ arrangement for pig & poultry manure will cease
  - EC will watch the situation closely
  - EPA monitoring & reports will provide the evidence
  - “Resource efficiency” and “input management” vital concepts for farming
Challenge: increasing outputs, while ‘maintaining’ or ‘restoring’ water quality (1)

- Water has a certain capacity to accept nutrients without causing pollution.

- Our objective should be to retain this capacity for productive uses, e.g:
  - Agriculture
  - WWTPs

- Some ‘leakage’ of nutrients from farmed land is inevitable

- So, HOW can we deal with the challenge??
Challenge: How can we increase outputs, while 'maintaining' or 'restoring' water quality (2)

- Minimising inputs from point sources:
  - On-site wastewater treatment systems (OSWTSs)
  - Farmyard dirty water

- If you had a stream with a flow of 10 l/s, all the P needed to bring the stream above the EQS of 25ug/l (high/good status boundary) would be 8kg/yr or 22g/d
Dirty water + silage effluent entering upper reaches of stream

Sabotaging agricultural development!!??

Therefore, it is vital that 'sloppy' farmyards and pipe discharges from OSWTSs should not use up the available capacity
Challenge: **How** can we increase outputs, while 'maintaining' or 'restoring' water quality (3)

- By focussing measures (PoMs) such that:
  - the maximum benefit and optimum environmental outcomes are achieved from the scarce available resources
  - the likelihood of European Court Judgements against Ireland are minimised

AND

While at the same time trying to minimise economic impacts
Achieving Adequate Outcomes: How???

Locate the critical source areas (CSAs)

Hydro(geo)logically susceptible areas (HSAs) + Pressures = CSAs
Thick subsoil on poorly productive aquifer
+ denitrification in bedrock
+ Free-draining soils =

Not a hydro(geo)logically susceptible area

good natural protection
Thin soil, no subsoil on karstic bedrock = minimal natural protection

A hydro(geo) logically susceptible area

For effective, focussed decision-making, consideration must be given to the contrasting physical settings present in Ireland and the associated variation in risk to water
Critical Source Areas

- Most diffuse pollution arises in a small proportion of the catchment area.
Comparison

Prioritised Areas (CSAs) for Actions

Poor Status

Good Status
Additional Measures Will be Needed

- Examples:
  - High status water bodies
  - Areas susceptible to nutrient losses
  - Sediment in runoff

- Increased buffer zones
- Riparian zones
- Prevention of animals in streams

**CAP Reform provides the opportunity for imaginative solutions**
Riparian Zone
Integrated Constructed Wetlands (ICWs)

- Integrated constructed wetlands (ICWs) are sequentially-linked ponds, vegetated by a range of plant species.
- They have the potential to treat the BOD & nutrients in effluents & soiled water effectively.

Integrated Constructed Wetlands (ICWs): Constraints

- Not suitable for high nutrient load effluents, e.g. $\text{NH}_4 > 100 \text{ mg/l}$
- Needs proper site investigation, proper design & installation & maintenance
  - Ponds need to be sized adequately
- Need to be lined
  - If with a subsoil liner, permeability must be $< 1 \times 10^{-8} \text{ m/s}$
- P. collects and then needs to be dealt with properly
- Discharge licence needed.
Finally ..... (1)

- Agriculture is one of the two major sources of nutrients in water
  - This needs to be accepted by the agri-sector
  - Need to break link between nutrient usage and nutrient losses

- Food Harvest 2020 presents threats and opportunities
  - Threats to water quality from increase nutrient inputs
  - Opportunity for farming practices that minimise “leakage” of nutrients from the soil while maintaining/increasing outputs

- EPA will monitor and report on water quality; if the required WFD objectives are not met, it will result in ECJs and may result in fines.
- EPA monitoring will measure our success in farming sustainably
Finally ..... (2)

- It is in all our self interest that farmers are aware/conscious of how little P & N can cause water pollution, and then take the necessary steps ......:
  - Advisors
  - Farming media
    - Encouraging farmers to 'see/visualise' that every kg of P & N lost to water is a problem to the Environment

- EPA is working with, and looks forward to, continued co-operation with DAFM, Teagasc, Bord Bia, etc, in the environmental appraisals of the Food Harvest scenarios
Challenges ahead – we will achieve more if we can co-operate together