

P.O. Box 539
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September 15, 2004

Mr. Russ Perkinson
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203 Governor St. Suite 206
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Dear Russ:

This letter, sent by both email and US mail, is in response to your solicitation for comments regarding the 09/09/04 DCR staff draft "Nutrient Management Training and Certification Regulations" following the fourth and final meeting of the Technical Advisory Committee.

The changes DCR proposes will not negatively affect agriculture, they will not significantly reduce nitrogen and phosphorus pollution of Chesapeake Bay, but they will guarantee continued build-up of phosphorus in Virginia soils. The proposed changes protect the poultry industry and continue to promote the land application of sewage sludge, including the import of sewage sludge from out-of-state. The changes do not significantly involve conventional fertilization and do not even begin to address the recognized need to reduce agricultural nonpoint source pollution by 40%.

The Code of Virginia (62.1-44.17:1.1.C.2a and 2b) is crystal clear that poultry waste should be applied at a rate that "...shall not exceed crop nutrient needs..." The Virginia Administrative Code (12VAC5-585-550.A) is crystal clear that "The applied nitrogen and phosphorus content of biosolids shall be limited to amounts established to support crop growth." Dr. Calmet Sawyer admitted to the Northumberland County Administrator, as reported in the Northumberland Echo (03/24/04 edition, p. 8) regarding a local land application that "The limiting factors included were only for nitrogen and lime. Phosphorus is not included." Failure to limit phosphorus land application of sewage sludge to the amount needed to support crop growth was a clear violation of Virginia Law.

DCR's comparison scenarios between the various suggested methods of phosphorus management, as well as publications provided to the committee, unequivocally demonstrate the leniency and permissiveness of the "Phosphorus Index" (PI) that DCR proposes to adopt. For the seven scenarios DCR chose to consider, none of the scenarios would permit phosphorus application based on soil analyses. Applying fertilizer only at the rate demanded by the crop, based on soil tests, as Virginia law currently requires, will have no adverse effect on agriculture and is a clear science-based practice least likely to release pollution to Chesapeake Bay. If there is sufficient nitrogen or phosphorus in the soil to grow the crop, there is no reason to add more. For the same seven scenarios, the existing Poultry Act would permit phosphorus application at crop-removal rates. This practice will not reduce the existing excess phosphorus in many soils in the Chesapeake Bay watershed, but at least soil phosphorus levels are not increased. For the same seven scenarios, the PI permits two fields to be spread at 1.5 times crop-removal rate. Applying phosphorus at a rate in excess of crop requirements cannot be justified on either agricultural or environmental grounds. Permitting phosphorus application at rates greater than crop requirements merely sanctions the use of fields as landfills for unwanted animal wastes and guarantees a long-term pollution potential.

As a professional geochemist, I have severe objections to the "science" on which the PI is based. PI assumes that phosphorus is lost to the environment along with soil particles. At the first Technical Advisory Committee meeting, David Kindig made a presentation dismissing the myth that phosphorus is only lost to the environment along with sediment, based on the 1997 research of Dr. Andrew Sharpley. David stated, correctly, "Research now shows phosphorus is lost as sediment P and dissolved P."

Continuing to sanction build up P levels in the soil, far in excess of crop requirements, to satisfy the need to dispose of animal waste guarantees long term bleeding of P into the environment and makes catastrophic P loss along with the soil much more likely. The coastal plain and Bay Act counties are especially vulnerable to P loss to Chesapeake Bay because of proximity to water, relatively flat topography, generally sandy soils low in aluminum and the presence of a relatively high water table. For these reasons, PI is especially unacceptable in Bay Act counties. PI is also inappropriate in the Shenandoah Valley because the actual paths of subsurface drainage in areas of karst are unlikely to be apparent from the land surface.

There are many other aspects of PI that I doubt can be scientifically justified. With reference to the handout “Virginia Phosphorus Index Version 1.3, Technical Guide” Tables 4 and 8 are identical except for different titles. I do not believe that the “sediment delivery factor” and the “runoff delivery factor” differ by only a factor of only 2.5 between the two end-member scenarios (>100 foot buffer width and field > 500 feet from the nearest stream, versus <36 foot buffer width [which could be zero] and 100 feet between the field and the nearest stream.) The potential for pollution between the two scenarios is, in my opinion, very much larger than a factor of only 2.5. The “quantitative science” on which these tables are based is not substantiated. Table 17 provides an excellent example of meaningless over-quantification. How can the “Subsurface DRP factor” be anything but zero when the soil contains no P according to a Mehlich I analysis? For the three regions, if the soil contained no P, two regions would have positive “Subsurface DRP factors” and in the third region the factor would be negative. This is clearly nonsense and there is no justification for using linear equations. Furthermore, there is little difference between the three equations. I challenge the authors of this document to demonstrate to me that linear equations are appropriate, that these three equations are different from each other, statistically, with greater than 95% confidence, and why a simple proportion, $DRP = 0.024 * (\text{Mehlich I in ppm})$, does not better represent the data. This may seem a small point, but we heard over and over that the PI “is based on science.” To some, Table 17 may look very scientific, but it is unsubstantiated nonsense. Nothing could be more science-based, simpler to explain to farmers, or easier to implement than “Analyze the soil and add only what the crop needs.” The mantra that “PI is based on science” is a smokescreen.

Additionally to being somewhat subjective, PI is difficult to implement or explain in contrast to “Don’t add fertilizer if the crop does not need it.” PI fails to achieve the often-stated goal of simplicity to explain and implement. One of the nutrient management planners at the meeting stated that he would not be able to serve as many fields because of the complexities involved if PI were adopted. Fewer fields under nutrient management plans is another step in the wrong direction and adopting a method as cumbersome as PI is not likely to encourage more voluntary nutrient management.

To summarize, weakening existing law mandating that the rate of nitrogen and phosphorus application from animal wastes “...shall not exceed crop nutrient needs...” to a PI will result in no benefit to farmers and will not significantly decrease nutrient loss to Chesapeake Bay. Adopting the PI will encourage poultry waste and sewage sludge disposal on Virginia cropland and pasture and continue to increase the phosphorus content of Virginia soils, many of which already contain enough phosphorus to support crop growth. There can be no justification for applying animal wastes at a rate in excess of crop requirements, except as an admitted means of disposal. By adopting these proposed regulations, the State will certify that animal waste disposal for a few Virginians involved in poultry growing, and for a few out-of-state sludge applicators trump improving water quality in “impaired” Chesapeake Bay.

Yours sincerely,

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and Edwin Allday Chair in Subsurface Geology

cc: Sec. Tayloe Murphy, Del. Albert Pollard, EPA