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Delivered electronically

Re: MDAR regulation at 330 CMR 31.00

October 27, 2015

Jessica Bunker
Holderness, NH

Dear Commissioner Lebeaux,

Cheri Cousens
No. Andover, MA

We appreciate the opportunity provided in the recent listening sessions and associated comment period to provide feedback on MDAR regulations, in particular the new nutrient regulation, 330 CMR 31.00. We had a representative at the listening session in Northampton earlier this month.

Michael Hodge
Concord, NH

Manuel Irujo
Quincy, MA

First, we applaud and support the Department's efforts to reduce phosphorus (P) impacts on surface waters. This is a significant issue that is of concern in many jurisdictions in this region. Our members are water quality professionals, closely attuned to the phosphorus issue.

Geoffrey Kuter
Amesbury, MA

Lise LeBlanc
Mount Uniacke, NS

However, we believe the new MDAR nutrient regulation is overly broad in scope, overly simplified, and not clearly focused on addressing the goal of the regulation, to reduce phosphorus impacts to surface water. The rules, as written, have the potential to severely restrict the use of organic matter-based soil amendments in Massachusetts without clearly providing a positive impact on surface water quality. Currently, the regulation does not take into account phosphorus availability in phosphorus-containing materials. Addressing this issue could greatly improve the effectiveness of the regulation without negatively impacting the use of organic matter-based soil amendments.

Deborah Mahoney
Boston, MA

Donald Song
Topsham, ME

Mark Young
Lowell, MA

Executive Director

Ned Beecher

As we stated in our comments on the draft rule in 2014, we recommend thorough revision of 330 CMR 31.00, not only to realign the goal to be more consistent with other state policies and regulations (considering the "big picture"), but also because, as written, this rule is contradictory, confusing, and unenforceable (see examples detailed below).

We also want to note that control of phosphorus and general nutrient management is not something MDAR has to address on its own and all at once. These topics are already getting plenty of attention, including at the federal level. Specifically, agriculture nationwide is increasingly impacted by the federal nutrient management best practices detailed in the Natural Resource Conservation Service (NRCS) Code 590 (adopted in December 2011). MDAR regulation should integrate with these nutrient management guidelines, help to implement them, and only supplement them as needed.

330 CMR 31.00 in the “Big Picture”

The implementation of the new MDAR nutrient regulation is especially troubling right now when the Massachusetts Department of Environmental Protection (MassDEP) has worked hard over the past few years to divert organic residuals from landfills and boost energy production from these residuals. The new nutrient regulation has the potential to significantly obstruct the utilization of the nutrient-rich products (digestates, composts, etc.) being created from these diverted organic residuals. Why? Because these diverted organics all contain phosphorus, in most cases above the new regulatory threshold of 0.67%. According to the definitions in the new rule, these diverted organic residuals products are all “Plant Nutrients,” and their uses are restricted. This results in a reduction in the land areas where these organic residuals products may be used, thus limiting in-state markets just when more products are being produced. This seems to be a case of contradictory regulatory initiatives by two state agencies - agencies that exist under the same organizational umbrella.

As noted, we agree with the overall goal of the new regulation: reducing the impacts of non-point-source P on surface waters. And we agree that the new nutrient regulation should consider the P in organic residuals recycled as soil amendments. But the regulations should not assume that the P in all of these products is of equal environmental significance – because that is not what the science shows. The environmental significance of P in a soil depends on its water solubility, the P saturation, and other parameters. In contrast, the standard soil tests used by UMass and a few other states in the Northeast are designed to provide information on the availability of nutrients *for growing crops*. This does not correlate directly with *environmental significance*.¹ Understanding of the environmental significance of P in a soil is something that has been developed through research and modeling incorporated into Soil P Indices, which many states use. (Massachusetts’ P Index does not incorporate the availability or solubility of P in its calculations; it would need updating in order to do so).

Research indicates significant variations in P availability and the environmental significance of P from one soil to another and one organic residual to another and in comparison to chemical fertilizer. The P in some residuals, such as biosolids containing significant amounts of aluminum (Al) and iron (Fe), is less environmentally significant (available) than the P in chemical fertilizer. This research has resulted in P source coefficients being integrated into state phosphorus indices in several states (e.g. DE, NH, PA). The source coefficient can be measured for any particular product, allowing for an accurate, realistic application rate based on available, significant phosphorus.

In short, the new 330 CMR 31.00 regulations negatively impact potential in-state markets and uses of P-containing organic residuals², without taking into account the actual risks of these materials to surface water quality. These impacts can be lessened if MDAR and UMass Extension utilize a more nuanced, scientific approach, such as the use of P source coefficients, rather than the blunt prohibition on application

¹ For example, see Kovar, John L. and Gary M. Pierzynski, eds. 2009. *Methods of Phosphorus Analysis for Soils, Sediments, Residuals, and Waters, Second Edition*. Southern Cooperative Series Bulletin No. 408. http://pss.okstate.edu/People/faculty-info/zhang-hailin/research/2004%20and%20earlier%20research/Methods_of_P_Analysis_2000.pdf

² We do not know the extent to which markets for organic residuals products are reduced by the new regulation, because there appears to be no data available showing how prevalent, and where, are soils that test high for P. Speaking with the UMass soil lab, we learned that a sizable number of soil tests do show high P levels. But the lab does not have funding to compile and analyze their soil test data that have accumulated over many years, which would help indicate how common high P soils have become. Experts suggest that, most likely, the following soils test high for P (from highest to lower P levels): flower gardens > vegetable gardens > small vegetable farms > dairy farms > other agricultural soils > golf courses. Thus, organic residuals products, such as composts, that are commonly used on flowers, vegetables, and small vegetable farms will most likely not have these outlets available for use under the new regulation.

of P in any situation where a soil test shows adequate P levels based on a single, aggressive soil test (modified Morgan) that was never intended to measure environmental significance. A revised nutrient regulation – and/or associated Extension guidelines – could target the most significant sources of environmentally significant P, while not so dramatically discouraging the use of diverted organic residuals.

Why is it important to remove obstacles from the use of diverted organic residuals? Because these materials have been clearly demonstrated to:

- Improve soils by adding micronutrients and organic matter;
- Recycle nutrients locally;
- Reduce dependence on fossil-fuel and mine-derived fertilizers from far beyond the Commonwealth;
- Reduce climate impacts by recycling, sequestering carbon, and replacing fossil-fuel-derived products; and
- Provide jobs in the local economy.

Looking at the “big picture” and working in collaboration with MassDEP’s efforts (and farmers and landowners using diverse soil inputs, including organic residuals) would lead to a better nutrient management regulation.

A recent summary of the phosphorus “big picture” by Jarvie, Sharpley, et al. (2015) states: “Policies and initiatives to promote food and energy security, via agricultural intensification, will need to be better coordinated and tied inextricably and financially with P recycling and implementation of land and soil conservation measures to address both elements of the P paradox: the long-term P scarcity and P overabundance impairing water security....

“Recycling of organic carbon–rich manure or biosolids wastes sustains vital underpinning ecosystem services by enhancing microbial activity and nutrient cycling, retaining soil moisture, and reducing soil erosion. In fact, there is currently ample P produced in manure and human waste in the United States to satisfy P demand for crop production.”³

The use of local organic residuals should be a priority of MDAR, in concert with MassDEP.

Selected Examples of Confusion and Contradiction in the New 330 CMR 31.00

- First, what is the goal here? We understand it to be to reduce phosphorus inputs to surface waters from agricultural and non-agricultural soil fertilization. But the rule seems to address all nutrients - even micronutrients such as copper and zinc, although stipulations in the new regulation about those other nutrients are minimal and vague. Potassium is a macro-nutrient, but it does not receive much attention in the regulation; does it need to be included at all? Is there any reason for doing so? We strongly urge the Department to focus on what’s important for now – environmentally significant P (and, perhaps, N) – and simplify the rule accordingly.
- Existing UMass Extension guidance and best agronomic practices in some instances contradict the new nutrient regulations. For example, P fertilizer is recommended for corn crops in the early season, when soils are cool, even when a soil test shows a high level of P. Presumably, if UMass Extension guidelines recommend this use of P, then the new regulation would allow it. As Dr. Tom Morris (Univ. of Connecticut), New England’s soil fertility specialist, noted at an August workshop:

³ Jarvie, H.P., A. N. Sharpley, D. Flaten, P. J. A. Kleinman, A. Jenkins, and T. Simmons. 2015. The Pivotal Role of Phosphorus in a Resilient Water–Energy–Food Security Nexus, *Jour. of Env. Qual.* <https://sera17dotorg.files.wordpress.com/2015/02/nexus-p-jarvie-ea-jeq-2015.pdf>

“maybe the regulation will need to be flexible in that case.” In what other ways will the regulation need to be flexible? Who will decide? How clear are UMass Extension guidelines? Are they clear enough to avoid multiple interpretations? The Extension guidelines were not developed with the new nutrient management regulations in mind. Lack of clarity means managers of organic residuals and other P-bearing materials are uncertain what they can and cannot do.

- The new regulation contains arbitrary detailed requirements that make little sense. For example, the setbacks from surface waters of applications of plant nutrients to turf are different from the setbacks for applications of plant nutrients to pastures. Why? Perhaps this kind of detail is better addressed in guidelines and P Site Index calculations, not in regulation.
- Sections 31.03 and 31.05 create restrictions of applications of nutrients on agricultural and non-agricultural lands, respectively. But sections 31.06 and 31.07 do not specify what kinds of land areas these sections pertain to. Thus, the first statement in 31.06 seems to require a soil test for any nutrient application anywhere: “a soil test must be obtained prior to any initial application of phosphorus.” So does this mean that home gardens, roadside plantings, etc. are actually covered by the regulation? And what does “initial” mean here?
- Section 31.05 is titled “Requirements for the Application of Nutrients to Land Not Used for Agricultural Purposes.” However, all of the requirements in that section seem to speak specifically about restrictions for “lawn or non-agricultural turf.” Therefore, shouldn’t the title of this section be “Requirements for the Application of Nutrients to Lawn and Non-Agricultural Turf?” This distinction is important, because it is currently not clear if the regulations apply to gardens, roadside vegetated areas, other horticultural applications, etc.
- The regulation can be reasonably interpreted to apply to all soils in Massachusetts, and the MDAR Fact Sheet regarding the non-agricultural aspects of the regulation reinforce this interpretation in its first paragraph: “provide sufficient nutrients for maintaining healthy agricultural and non-agricultural land, including turf and lawns, while minimizing the impacts of the nutrients on surface and ground water resources to protect human health and the environment” (emphasis added). All soils are included if the two categories within the regulation are described as “agricultural” and “non-agricultural.”
- Section 31.05(5) creates a catchall for all sources of “Plant Nutrients.” If an applicator has to account for all current and prior (“known”) plant nutrients applied, then all sources of plant nutrients are automatically covered by the regulation, whether or not any of them appear to be exempted (e.g. as “natural organic fertilizers” are exempted from the definition of “fertilizer” – see below). In response to questions about this, the regulation’s author, Hotze Wijnja, seems to confirm this interpretation.
- The definitions in 330 CMR 31.00 create the most confusion:
 - The definition of “Phosphorus Containing Fertilizer” excludes “Organic Compost” and “Natural Organic Fertilizer.” But this particular phrase (“Phosphorus Containing Fertilizer”) is actually only used in the section of the regulation that applies to “lawn and non-agricultural turf.” When it comes to discussion of applications to *agricultural* lands, the term “Plant Nutrients” is used – and it specifically includes biosolids and other organic residuals.
 - It is unclear whether or not “Biosolids” fall under the definitions of “Organic Compost” and “Natural Organic Fertilizer” - they certainly could. But, if that is the intent, why not make this clear in the definitions of those terms? By separately defining “Biosolids,” the rules

- seem to separate them out from other composts an/or natural organic fertilizers.
- The definition of “fertilizer” has issues: For example, some biosolids products have “guaranteed analyses of primary nutrients,” but this definition of “fertilizer” suggests biosolids are excluded, because biosolids seem to fit the definition of “natural organic fertilizer.”
 - The definition of “natural organic fertilizer” creates much confusion, because it sounds like it includes many of the other defined materials (e.g. Agricultural Byproducts, Biosolids, Organic Compost), but it does not mention them specifically. Why not mention them as examples (e.g. “including...”) ? In addition, the word “fertilizer” is used here - which refers to something with a guaranteed analysis, per the prior definition – yet many materials that would seem to fall under this definition of natural organic fertilizer do not have guaranteed analyses.
 - Just as problematic is the definition of “Plant Nutrient.” This definition is not consistent with the common dictionary definition. By common usage, a plant nutrient is *the nutrient*, not some substance that contains the nutrient. This adds to the confusion caused by the regulation’s myriad, conflicting definitions of materials that contain plant nutrients. In addition, the definition includes the actual words “Plant Nutrient,” creating a circular reference! Plus, this definition includes “any recognized Plant Nutrient,” which opens up myriad elements – calcium, zinc, copper, boron, sulfur, etc. Is the regulatory intent to control application of every micronutrient? And what does the term “Organic Compost as Fertilizer” mean? Compost rarely has a guaranteed analysis, so it does not meet the regulation’s definition of fertilizer.
 - Lastly, with regards to how biosolids are affected by the regulation: the definition of “Plant Nutrients” specifically includes biosolids. And, throughout the regulation, it is “Plant Nutrients” that are most commonly and broadly restricted, including on turf grass. Therefore, it is very reasonable to interpret this regulation as restricting biosolids use for both agricultural and non-agricultural turf use. However, some people have (mistakenly, we believe) looked at the definition of “fertilizer” and its exclusion of “product blended from organic compost or natural organic fertilizer” and assumed that biosolids (or other organic residuals products) are somehow exempt. Another source of confusion.
 - One more thing about “Plant Nutrients:” Why is this term capitalized in some places and lower case in others?
 - The definition of “Primary Nutrient” is also confusing. N, P, and K are the primary plant nutrients, but there are many other nutrients that are “essential for normal plant growth.” And by saying “and that includes total...” the definition suggests that other plant nutrients beside the big three could be included in this definition. Why not just define this as follows: “Primary Nutrients - nitrogen (N), phosphorus (P), and potassium (K).”

And, Lastly, Concerns About the Rulemaking Process...

In 2014, NEBRA provided comments on the draft of this regulation. Our current comments echo those comments. But there are additional issues pointed out earlier that we do not include here, and vice-versa. In particular, in those prior comments, we noted that the development of this regulation seemed rushed and confused (e.g. there were references in the draft that pointed to information at NRCS that did not exist at the time). We understand that there was a legislative mandate, but that does not excuse suddenly imposing a poor quality final rule.

Over the past year, since submitting comments to the Department and thus showing ourselves to be an interested party, we heard nothing on the status or further development of the new regulation. We understand from other stakeholders that they, too, received no further notice – until the final regulation was suddenly announced late this spring, with an immediate effective date (for part of the regulation).

There was never any response to comments, and, in finalizing the rule, it seems the Department ignored many comments.

The last concern about the process stems from the fact that, despite our 2014 comments, our clear interest, and conversations this year with MDAR staff, we were not included in direct notification about this month's MDAR regulatory listening sessions. And the advance notice regarding these listening sessions was woefully inadequate, on the order of days.

Our Recommendations

- Simplify 330 CMR 31.00. Be clear about your goals: focus on P and the most significant fertilization-derived sources of excessive, environmentally significant P in Massachusetts, based on best current research.
- Simplify and clarify definitions to minimize confusion and to be clear about materials to which the regulations apply.
- Consider this regulation to be a first step, not the final complete solution to non-point P issues. For example, other states that have restricted P in fertilizers have applied the restrictions more narrowly, for now. New Hampshire and Connecticut regulations apply just to turf grass management. Let's apply adaptive management to this complex issue.
- Continue to reference UMass Extension guidelines that are flexible and adaptable to particular sites and situations.
- Ensure adequate resources and support for the development of additional, simplified UMass Extension guidance that directly pertains to the nutrient regulations and addresses not only chemical fertilizers, but also organic residuals products.
- Support the inclusion of phosphorus source coefficients in determinations of appropriate application rates of P-containing soil amendments.
- Ensure adequate resources – staff time and money – to support extensive education and outreach efforts in the agricultural community and the broader public regarding best management of P from fertilizers and soil amendments (including recycled organic residuals).

In the meantime, for the short term, we recommend that the Department issue a written statement clarifying whether or not and to what extent the new 330 CMR 31.00 regulations apply to biosolids and other organic residuals products. For example, to which of the following do the regulations apply?:

- purchased biosolids applied to agricultural land
- purchased manure on agricultural land (a farm that doesn't have animals that imports chicken or dairy manure for crop production)
- direct application of compost to agricultural land
- applications of digestate from anaerobic digestion to agricultural, horticultural and residential uses
- use of compost in topsoil blends that are then used for residential applications.

Thank you again for this opportunity to comment.

If you have any questions or need further information, please don't hesitate to contact us.

Best regards,



Andrew Carpenter, Immediate Past President



Ned Beecher, Executive Director

cc. Alisha Bouchard, Chief of Staff, MDAR
Jessica Burgess, Esq., MDAR nutrient regulation working group
Undersecretary Rachel Madden, MA Ex. Office of Administration & Finance
Commissioner Martin Suuberg, MA Dept. of Environmental Protection
Ann Lowery, Assistant Commissioner, MA Dept. of Environmental Protection
John Fischer, MA Dept. of Environmental Protection
James Doucett, MA Dept. of Environmental Protection
David Duest, Mass. Water Resources Authority
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Joseph Favaloro, MWRA Advisory Committee
Andreae Downs, Wastewater Advisory Committee to the MWRA
Mary Owen, UMass Extension
Thomas Akin, Massachusetts NRCS
Brad Mitchell, Massachusetts Farm Bureau Federation

The North East Biosolids and Residuals Association (NEBRA) is a 501(c)(3) non-profit professional association advancing the environmentally sound and publicly supported recycling of biosolids and other organic residuals in New England, New York, and eastern Canada. NEBRA membership includes the environmental professionals and organizations that produce, treat, test, consult on, and manage most of the region's biosolids and other large volume recyclable organic residuals. NEBRA is funded by membership fees, donations, and project grants. Its Board of Directors are from MA, ME, NH, and Nova Scotia. NEBRA's financial statements and other information are open for public inspection during normal business hours. For more information: <http://www.nebiosolids.org>.