

Phase II Public comments

Virginia's Phase II Watershed Implementation Plan suffers from the same flaw as did previous plans. It does not seriously address the Bay's largest source of Nitrogen (N) and Phosphorus (P) pollution, namely inefficient agricultural fertilization. According to USGS Scientific Investigation Report 2011-5167 "Nitrogen contributions to Chesapeake Bay from the watershed are attributable primarily to agriculture. The combination of manure and fertilizer applications and fixation by crops provides 54% of the estimated nitrogen contributions to the Bay." (p. 19) "Nearly half (43%) of the phosphorus reaching the bay is contributed from upstream agricultural fertilizer and manure applications ..." (p. 21). If mineral dissolution is factored out because it is a natural process, half the P pollution is of agricultural origin, a great deal of it from the disposal of poultry litter by land application.

Four sources of pollution (sectors) are addressed in Virginia's Phase II Plan. Here are the number of pages devoted to each of the 4 sectors: 1) Agriculture – 12 pages, 2) Urban/suburban, including wastewater, stormwater and combined sewage overflow (CSO) – 35 pages, 3) Forests – 3 pages, and 4) On-site waste disposal – 6 pages.

Forests cover about 58% of the Bay watershed today. N and P have always cycled through the forest/bay ecosystem. Little nutrient pollution reduction can be achieved from this sector because little of the pollution is of anthropogenic origin. Forests are very effective in sopping up (nitric) acid rain. A ban on timbering within 100 feet of the water would be a simple and effective strategy, well documented in the scientific literature. It is uncontested that a riparian buffer containing mature trees at least 100 feet wide adjacent to waterways can significantly reduce water pollution. Unlike shrubs and grasses with shallow roots, which do impede runoff, the deep roots of trees remove nitrate from the groundwater and promote denitrification, or the conversion of nitrate to harmless N₂ gas. The Implementation Plan claims to "Investigate methods to preserve forest buffers..." (p. 78), but provides no new guidelines on how to deal with the contentious issue of mandating buffers on private land. We have understood for decades that this inexpensive method of reducing pollution works, but the Implementation Plan changes nothing.

On-site waste disposal, mostly by conventional septic systems, causes less than 5% of Bay N pollution yet it gets half as much attention as agriculture, the largest source of pollution. Replacing older systems with "engineered" systems to promote denitrification is expensive and will be imposed, beginning in 2013, despite the fact that much larger sources of pollution are not being meaningfully addressed. This is one of many examples where the State transfers responsibility from where it belongs, namely agriculture, to the public. If the goal for large onsite systems is to "demonstrate compliance with the <3mg/liter Total N at the project boundary." (p. 30), why shouldn't agricultural fields be required to reach the same nitrogen concentration in groundwater discharged directly to rivers and the tidewater? There are a lot more acres of agricultural fields than there are septic systems. According to the USGS (Circular 1228), on the Eastern Shore where 69% of the N pollution and

71% of the P pollution is of agricultural origin ” ... the median concentration of nitrate from 29 wells in agricultural areas was 5.4 mg/l, and the maximum was 37 mg/l. Water in about one-third of the wells exceeded the Primary Maximum Contamination Level of 10 mg/l established by EPA.” (p. 6). What justification exists for requiring a tiny source of N pollution, on-site systems, to be strictly regulated at great expense to homeowners, when a very much larger source of pollution is ignored?

Urban/suburban pollution receives the most verbiage, which is unjustified because significant pollution reduction has already been achieved, at great expense, from this sector. For example, in the Potomac River watershed the N discharge, in million pounds per year (MPY), was 9.8 in 1985, 7.9 in 2002 and 3.6 in 2009. The “allocation” for 2025 is 3.3. If discharge could be reduced to the “Limit of Technology” it would be 2.9 MPY. Stormwater N pollution is about 20% of wastewater point-source discharge. CSO is small, and scheduled for elimination. Clearly, this sector is “on track.” Bay water quality has not meaningfully improved as point-source pollution, directly discharged to the Bay, has demonstrably been reduced. Further scheduled reductions, desirable and expensive as they are, will have little effect on improving Bay water quality. Yet given these facts, most of the Phase II plan is devoted to this sector, again transferring “blame” from where it really belongs.

Lawn fertilization is often blamed for Bay pollution, and there is wide agreement that many lawns are over-fertilized. But assuming that about 80% of rural Virginia households have lawns averaging less than half an acre in size, the acreage in lawns is less than 10% of farmed acreage. The amount of P pollution caused by the disposal of animal waste, especially poultry litter, on fields in the guise of “free fertilizer” vastly exceeds the pollution reduction achieved by restricting P application on lawns. Again, responsibility is deflected from the largest polluter, agriculture, and focused on citizens.

It is critical that the public understand the inefficiency of conventional chemical agricultural fertilization, the crux of the Bay’s pollution problem. Numerous scientific publications, including from the National Academy of Sciences, document that Nitrogen Use Efficiency (NUE), the percentage of applied nitrogen sequestered in the harvested crop, is rarely better than about 65%. Roughly one third of the N applied to fields ends up as pollution. Only small amounts of reactive N are eliminated by denitrification in oxidized soils.

Many authors have identified the problem, namely that farmers commonly apply fertilizer at the time of planting to maximize crop yields, an understandable practice in a capitalist system where pollution is not cost-accounted. As an example, Raun and Johnson (1999, *Agron. Jour.* 91: 357-363) contend that fertilizer “...affordability and the convenience of not having to apply N again during the growing season is attractive to farmers. In this regard excess N is applied as insurance, and because farmers are often overly optimistic concerning expected yields and yield goals. Because of this, the affordability of N in the developed world has led to its misuse and over application.”

The Phase II plan reads like one more bureaucratic/administrative wish list that encourages more bureaucracy/administration and funding for farmers. As an example, consider cover crops, planted over winter to consume some of the excess fertilizer applied during the growing season. The cover crop is then incorporated in the soil in spring to reduce the amount of required fertilizer and increase soil "tilth". A good idea? Yes, but only if farmers pay for it. Cover crops do not reduce fertilizer application to the preceding crop so they do not address the root problem, inefficient fertilization. If society pays for cover crops, all we are doing is providing farmers with yet one more subsidy for very little pollution reduction. Pollution must always be addressed at its source. It is always easier and less expensive to stop polluting rather than try to "sop it up" later.

The Phase II plan does not seriously address the root of the Bay's problem, inefficient fertilization. The "Nutrient Management" section contains only seven items that are replete with phrases like "work with....", "advocate..." or "investigate opportunities." All seven are contingent on funding for "partners", "reimbursement", "staff", "certified employees" and "technical service providers." Is EPA really going to accept the statement "The strategies are not to be viewed as firm commitments on the part of any of the local governments nor the Commonwealth." (p. 19)? There should be very much more in the document to specifically address the root cause of Chesapeake Bay's nutrient overload and actually implement increased fertilization efficiency. Whether EPA requires an Implementation Plan that will lead to meaningful pollution reduction that adheres to President Obama's Executive Order issued 05/12/09 to "Establish a clear path to meeting, as expeditiously as practicable, water quality and environmental restoration goals for the Chesapeake Bay", or accepts yet one more bureaucratic/administrative wish list remains to be seen.

Here is what must be done:

- 1) Ban the land application of all animal waste (poultry litter, municipal sewage sludge and manure) if it must be transported on a public highway for disposal so as to exempt small farms. As a precursor to an outright ban, land application should be P-based. No science supports the need to supply P in excess of crop requirements. Failure to impose a P-based restriction certifies that government agencies advocate "free fertilizer" and cheap waste disposal over water quality. Animal waste is a massively inefficient "fertilizer" with a NUE as low as 30% in the case of sewage sludge. Phosphorus should be recovered from the waste and the remainder used as biofuel. The Director of the EPA Region III Chesapeake Bay Program Office, Mr. Jeffrey Lape, stated (his letter is posted on the "Correspondence" page at www.VaBayBlues.org) "We estimate that agricultural animal manure and poultry litter [he omits municipal sewage sludge] contribute about half of the agricultural nutrient load to the Chesapeake Bay." Cheap disposal of animal waste by land application causes one-quarter of Bay nutrient pollution, and is sanctioned by the Virginia legislature, who clearly believe that improving the bottom line for less than 10% of farmers and subsidizing the poultry industry trumps improved water quality.
- 2) Apply a "pollution tax" to conventional fertilizer but not to controlled- (slow-, timed-) release products, with a goal of increasing NUE from 65% today to at least

80%. Agronomists must change their focus from “maximize crop yields and damn the consequences” to “improve fertilization efficiency and reduce pollution while maintaining acceptable crop yields”. There are real economic costs to society because of pollution and these costs must be accounted. We must not delude ourselves that improving Bay water quality will come without cost. The best we can do is spread the cost widely and equitably. As long as society demands the cheapest possible food above all else, progress is not possible.

Until fertilization practices become more efficient we will continue to spin our wheels on the issue of nutrient overload to the Bay. All our “light green” efforts (to borrow a phrase from Howard Ernst’s book “Fight for the Bay”) to address tiny sources of pollution and chip away at the problem will not result in meaningful Bay water quality improvement. Significant immediate decreases in pollution from point source discharges from wastewater plants have not significantly improved Bay water quality. “Every little bit helps” is true, but only major changes in the way crops are fertilized can measurably improve Bay water quality, which will take time. We are not alone because there are 7,000 more water bodies in the USA formally “impaired” because of nutrient load, listed, but not acted upon, by EPA. The Bay is the final arbiter. Until significant improvement in Bay water quality occurs, which will not happen under this “plan,” no government agency can claim that agriculture’s efforts to reduce pollution have been meaningful.

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