

August 16, 2022

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RE: Comments on the Draft Preliminary Modeling Results for the Maumee TMDL

Dear Chief Kavalec,

On behalf of the Alliance for the Great Lakes, Ohio Environmental Council, and our thousands of members and supporters throughout the state, we respectfully submit these comments on the draft Preliminary Modeling Results (PMR) for the Maumee River Total Maximum Daily Load (TMDL). The TMDL is critical for outlining the management practices needed in the watershed to achieve water quality goals and the mechanisms necessary to hold the state accountable for meeting water quality targets in the Maumee Watershed. The Maumee Watershed TMDL will serve as the roadmap for state agencies, agricultural groups, environmental organizations, researchers, and other watershed partners as we work collectively to improve the water quality of the watershed and the Western Lake Erie Basin. To ensure a robust, effective TMDL is developed, the base data generated in the PMR regarding phosphorus sources and loading must be as accurate and as comprehensive as possible. While the draft PMR provides sufficient background information on the issues surrounding phosphorus in the watershed, we believe several key assumptions made throughout the PMR and the lack of more recent livestock data for the watershed limits the reliability of the PMR loading allocations.

The following comments are structured around six main topics: assumptions regarding phosphorus generation, transport, and utilization; total phosphorus vs. dissolved reactive phosphorus; allowances for future growth; margin of safety; and reasonable assurances.

#### Assumptions regarding phosphorus generation, transport, and utilization

We appreciate the detailed background information provided by OEPA in Section 2 of the PMR which describes the sources, characteristics, and relative risks of phosphorus in the Maumee. We understand that the complexities around phosphorus fate and transport within the watershed, the heterogeneity of sources, and the scale of the watershed present challenges to developing a TMDL. However, the PMR

makes several assumptions regarding the risks associated with manure in the watershed by potentially downplaying the role and transport of manure in relation to the rapid growth of animal units in the region.

**Comment #1: The rise in livestock numbers in the Maumee is concerning and will negatively impact our ability to develop an accurate picture of P loading sources as we seek to meet water quality targets in the forthcoming TMDL.**

The PMR uses animal units from the 2017 Census of Agriculture to calculate the overall volume of manure generated to extrapolate the amount of manure P generated in the watershed. Relying entirely on Census of Agriculture numbers ignores the exponential growth in livestock numbers since 2002. Appendix 1, Figure A1.1, clearly shows significant growth in livestock numbers from 2002 to 2017. During that period, swine animal units increased approximately 128%, poultry 87%, and cattle 48%. More concerning is the rapid growth observed between 2012 and 2017 in which time swine numbers increased by approximately 28%, poultry by 101% and cattle by 7%. We see no reason to believe growth has not continued in a similar trajectory since 2017 for each animal category and yet, the PMR does not appear to consider animal units from annual NASS survey efforts, current year NPDES permit levels, current CAFF permits, or apply an assumed increase that mirrors past growth rates. We request that the PMR attempt to derive accurate, updated animal unit numbers either using existing data sources as described earlier or updating sector P loading sources with the 2022 Census of Agriculture data once it becomes available in mid-2023.

**Comment #2: Manure is not spread uniformly across the watershed and overapplication of manure does occur.**

The PMR asserts that manure is spread uniformly across the watershed and thus provides 22% of the crop nutrient (P) requirements across the Maumee (pg. 14). This assertion was confirmed during a July 29, 2022 phone call with OEPA and ODA. The assumption that manure is spread uniformly is contradicted by Kast, et al. (2021), which OEPA cites extensively throughout the PMR, which states that swine manure from permitted CAFOs is applied within 1.2 miles of the barn and cattle manure within 1.8 miles. The logistical challenges of hauling liquid manure can result in an over-concentration of manure and nutrients in fields closer to barns.

The PMR (pg. 16) also asserts – citing Kast et al. (2019) – that ‘widespread’ overapplication of manure does not occur in the Maumee. The assertion ignores major caveats cited by Kast et al. (2019) who noted, “A critical knowledge gap for manure management in Ohio is the management of manure that is distributed offsite through D&U [Distribution and Utilization Program]. Manure application methods as well as field locations and their STP [Soil Test Phosphorus] levels need to be maintained by the CLM or certified fertilizer applicator, but do not need to be reported to the state. Approximately 75% of all manure nutrients generated on CAFOs in northwest Ohio including all size poultry CAFOs that were analyzed is land applied on fields in which CAFOs use the D&U process to transfer their manure to other farms. This results in manure management from the majority of CAFO produced manure being unavailable for analysis and largely unknown” (pg. 1,167 of Kast et al. 2019). Kast et al. (2019) also notes that, “While

publicly available data show that, in general, CAFOs in the region are adhering to their state-approved permits, a knowledge gap regarding the management of approximately 80% of manure P exists due to manure transferred through D&U and manure produced from non-permitted livestock operations.” From an agronomic perspective, soils with STP levels in the optimal range provide the growing crop with all the P it needs to grow productively. Therefore, any additional P applied to an optimal STP level field would be considered an overapplication. The PMR has not defined “overapplication”, does not analyze current STP levels across the watershed, and is conceivably underrepresenting the extent of optimal STP levels and the occurrence of manure application to fields that do not need it. Given these knowledge gaps, OEPA cannot definitively state, nor should the PMR be structured around the assumption that overapplication is not widespread in the Maumee.

The PMR (pg. 19), we believe, downplays the environmental risk of overapplied manure by citing conclusions from Kast et al. (2021) who found similar average delivery ratios between commercial and manure fertilizers. However, the PMR narrative omitted critical information presented by Kast et al. (2021) who found that the fractional delivery of overapplied manure P to the watershed was higher than overapplied commercial P and noted that state regulations allow for application rates that are 3-5 times greater than agronomic requirements.

Consistent application of liquid manure to fields near livestock operations often results in increasing STP levels and increases the likelihood of P leaching to tile lines or running off agricultural fields during rainfall events. This overapplication occurs in watersheds across the country and almost certainly occurs within the Maumee. A recent publication by Environmental Working Group (2022)<sup>1</sup> illustrated the resulting ‘hot spots’ that are created because of limited hauling, further bolstering the conclusions of Kast et al. (2019). OEPA should identify the spatial extent of manure application to nearby fields – from both permitted and unpermitted facilities – to provide a more accurate depiction of where and how much manure is applied each year. Understanding the spatial limitations of manure transport within the Maumee will allow OEPA and ODA to better prioritize BMP implementation.

### **Comment #3: Manure application does not result in a 1:1 offset in use of commercial fertilizer.**

The PMR (pg. 15) asserts that manure production and application in the Maumee offsets the need to apply commercial P fertilizer. OEPA and ODA made similar statements during a March 1, 2022, and a March 29, 2022, webinar respectively. Both agencies assert this cause-and-effect scenario but appear to largely rely on a portion of a concluding statement in a 2019 Environmental Working Group report on fertilizer trends in the watershed. The notion that manure offsets an equivalent portion of commercial fertilizer in the watershed assumes that manure is transported to and only applied on fields based on crop nutrient need and not proximity to production barns. Per Kast et al. (2021), and new modeling from Environmental Working Group (2022), we know that manure transport, particularly liquid manure from swine and dairy operations, is limited to adjacent fields. OEPA and ODA should implement reporting and accounting

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<sup>1</sup> Report and accompanying materials can be accessed [EWG analysis: In the Western Lake Erie Basin, newly identified animal feeding operation hot spots produce excess manure, threatening waterways and human health | Environmental Working Group](#)

requirements within state permits to better understand manure transport and application in the Maumee. Absent this information the PMR should not assume that manure provides an equivalent offset to commercial sources.

**Comment #4: The PMRs use of assumptions and proration in place of detailed, available data undermines its ability to accurately estimate wasteload allocations (WLAs) and load allocations (LAs). The lack of accuracy also diminishes the ability to determine necessary approaches and strategies to achieve the needed load reductions by all sectors over time.**

The PMR uses a prorated estimate of livestock populations within the watershed based on the percentage of a county's land base within the Maumee Watershed. This proration is used to estimate cropland acres, animal units, and crop distribution for 9 of the 17 counties in the watershed. Data exists – within the USDA's geospatial cropland data layer and annual USDA agricultural statistics survey data – to derive more accurate estimates of cropland acres, crops grown and livestock numbers within the watershed. Despite knowing – based on Kast et al. 2019 and 2021 and EWG (2022) – that neither cropland nor livestock operations are evenly spread across the watershed, the PMR assumes even distribution. The reliance on a coarse prorated estimation of keystone data points introduces greater and unnecessary uncertainty to the modeling effort used to estimate WLA and LA.

Similarly, the PMR assumes a 50:50 split of corn and soybean for all agricultural acres in the watershed. While those may be the most predominant crop types grown, choosing not to include, for example the acres of hay or wheat, is an oversimplification, particularly given that data sources exist to determine more specific crop distribution.

Opportunities exist within the PMR to use refined, data-driven approaches to determine livestock and crop distribution and we encourage OEPA to make these refinements in the final TMDL to promote greater accuracy, transparency and confidence.

**Comment #5: Appendix 1 should be revised to include greater detail and transparency surrounding the calculations for animal units, manure generation and resulting phosphorus generation.**

Generic equations are included in Appendix 1 to demonstrate how animal units, manure quantities and phosphorus concentrations are calculated, however it does not include the source data tables behind the calculated result. Absent the source data it is extremely difficult to assess the accuracy of the PMRs calculations for these factors. For example, in Appendix 1 Table A1.3, the PMR identifies manure P values from three different sources but does not identify which source was used to calculate the P content of manures and why that particular source was the best choice to use. Incorporating the source tables behind the calculations and results would bring additional needed transparency to the process.

## Total Phosphorus (TP) vs. Dissolved Reactive Phosphorus (DRP)

### **Comment #6: The PMR and TMDL should consider WLAs and LAs for TP and DRP**

Because Lake Erie's algal blooms are driven primarily by dissolved reactive phosphorus (DRP), it is essential to also base the TMDL loading analysis, load allocations, and implementation actions on DRP. As has been shown in research informing the setting of Annex 4 targets, TP loads may not change, while DRP loads could increase in proportion and have a magnified impact on bloom severity. There are many TMDLs that have been written for multiple forms of a pollutant. The US EPA states: "... a single TMDL document may be developed to address several waterbody/pollutant combinations. Neither the CWA nor EPA's regulations define or limit the scale of TMDLs." The Nutrients Annex 4 committee of the Great Lakes Water Quality Agreement and the OEPA have made such a strong case for how impactful DRP is on resultant harmful algal blooms in the basin. OEPA has clearly stated, and the LAP/PMR reflect, that DRP is not specifically considered in this TMDL. OEPA should document a clearly delineated road map for how resources and decisions to address DRP as an impairing pollutant of the water body will be accounted for in the future.

## Allowances for Future Growth

### **Comment #7: The PMR should include the consistent rate of growth of animal unit numbers in the watershed when considering its allowances for future growth.**

According to the USEPA *Guidelines for Reviewing TMDLs under Existing Regulations issued in 1992*, the USEPA requires that "a TMDL include load allocations, which identify the portion of loading capacity attributed to existing and future nonpoint sources and to natural background...Where possible, load allocations should be described separately for natural background and nonpoint sources." The PMR does not include future growth estimates within its LA for animal unit increases even while the data in Appendix 1 clearly identify consistent growth occurring in nearly all animal types over the past 20 years, in some cases with the greatest increases occurring between the most recent Census surveys. OEPA has not provided a sufficient rationale for omitting these future growth allowances and should incorporate growth projections of livestock in the final TMDL.

## Margin of Safety (MOS)

### **Comment #8: The margin of safety is arbitrarily low and does not account for uncertainty within the watershed.**

The Clean Water Act requires that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and waste load allocation and water quality (CWA 303(d)(1)(C), 40 C.F.R 130.7(c)(1)). The PMR defined a 3% MOS but includes no discussion on how the MOS was determined. Recent papers by Raff and Meyer 2021 and 2022 outline a mathematical process to quantify uncertainty which could serve as the foundation for the MOS development process within the

TMDL. Regardless of the computational process, we contend the 3% MOS in the draft PMR is inappropriately low given: 1) the lack of information about most of the manure in the watershed, including from unpermitted facilities; 2) the overall heterogeneity of the watershed; and 3) the size of the watershed which OEPA has stated makes it difficult to develop a single WLA and LA.

The 3% MOS in the PMR is also low compared to how other states address uncertainty within TMDL development. Minnesota includes – at minimum – an explicit 10% MOS for TMDLs while Michigan recently included a MOS close to 15% for their Ford/Belleville Lakes phosphorus TMDL, and OEPA included a 5% MOS in its Black River TMDL. Given numerous assumptions and lack of accurate source information in the Maumee the final PMR should adopt a 10% MOS.

### Reasonable Assurances

**Comment #9: The PMR fails to outline any reasonable assurances, novel implementation strategies, or new information to ensure LAs are achieved, giving downstream communities little trust that the burden of HABs on their lives will be alleviated.**

OEPA has stated that H2Ohio provides ‘reasonable assurances’ for nonpoint source reductions in the Maumee. We acknowledge that H2Ohio is a strong tool to combat nutrient runoff and we support its ongoing efforts to increase the use of conservation practices in the watershed. As drafted, the PMR seems to insinuate that the success of the TMDL is largely dependent on the success of H2Ohio. To further strengthen its efficacy, H2Ohio must include better reporting about how and where investments are made, and the water quality impacts achieved by funded practices. To date, program success is largely measured by landowner/farmer enrollment and not as a measurement of P loading reductions achieved. To ensure the program can meet the challenges faced, we firmly support funding H2Ohio in perpetuity.

The PMR does not seem to offer a new approach for providing reasonable assurances that NPS loads will be met and largely defers this discussion to the full draft TMDL. Deferring the discussion of reasonable assurances to the full draft TMDL limits the opportunity for meaningful, downstream community public comment on the portion of the TMDL which is an extremely important element of the plan.

Absent an effective strategy to combat nonpoint source runoff, downstream communities will continue to shoulder the burden to pay for pollution mitigation activities under tighter permit limits to compensate for the shortcomings of upstream, nonpoint source polluters. We already know, based on information collected by OEPA's Division of Drinking and Groundwater, that families in Toledo are paying nearly \$100/yr extra just to address HABs in drinking water sources which are caused largely by upstream nonpoint source agricultural pollution. This information was summarized by Alliance for the Great Lakes in 2022 and is included with our comment submission. The Draft TMDL must include a comprehensive roadmap outlining reasonable assurances for how nonpoint source LAs will be achieved that go beyond the status quo approaches.

We appreciate the opportunity to provide this feedback to OEPA and its partners and look forward to working with the OEPA and its partners to develop a TMDL for the Maumee Watershed that is robust, accurate and will deliver on water quality goals set for the WLEB.

Sincerely,

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